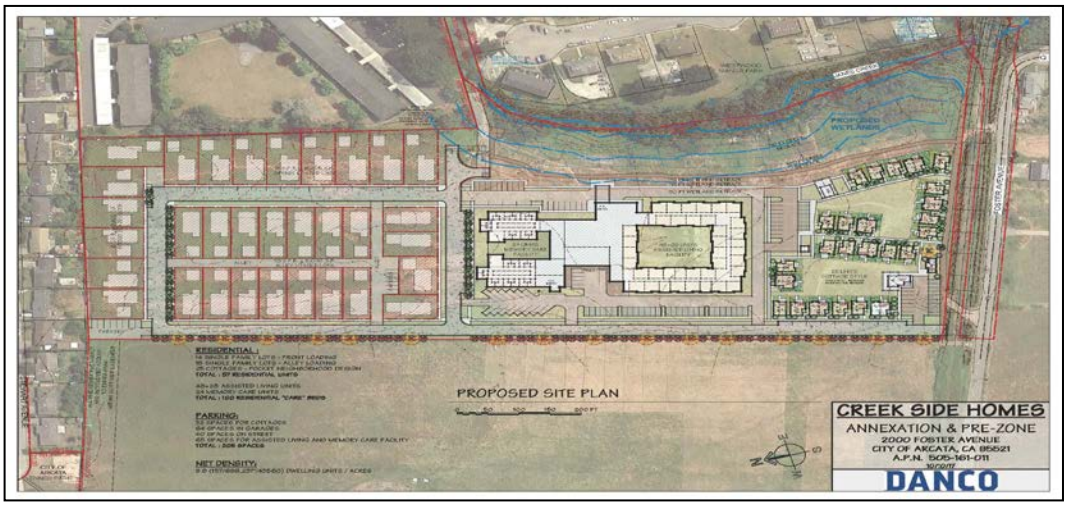
Creek Side Homes Project



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Lead Agency:

City of Arcata Community Development Department

State Clearinghouse # 2016022083

June 2019

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S. Water and Wastewater Impact of Sunset Area Housing Projects Memorandum (City of Arcata, 2017)
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X. Stormwater Management Assessment (SHN, Nov. 2018)
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Z. Biological Report (SPC, May 2016)
AA. Wetland Delineation (SPC, Feb. 2016)
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APPENDIX P

ADDITIONAL SITE INVESTIGATION REPORT

FORMER EEL RIVER SAWMILL SPECIALTY MILL
2000 FOSTER AVENUE, ARCATA, CALIFORNIA
CASE NUMBER 1NHU518

Prepared for:

Foster Avenue, LLC.

5251 Ericson Way
Arcata, California 95521

February 29, 2008

Prepared by:
Orrin Plocher and Stan Thiesen

of

Freshwater Environmental Services

1372 Anderson Ave.
McKinleyville, California 95519
Phone (707) 839-0091

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PROFESSIONAL CERTIFICATION

This report has been prepared by Freshwater Environmental Services under the professional supervision of Stan Thiesen. The findings, recommendations, specifications and/or professional opinions presented in this report have been prepared in accordance with generally accepted professional hydrogeologic and environmental consulting practices, and within the scope of the project. There is no other warranty, either express or implied.

Stan Thiesen
P.G. No. 7990
Geologist
Freshwater Environmental Services

APPENDIX P

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1.0 INTRODUCTION

Freshwater Environmental Services (FES) has prepared this Additional Site Investigation Report to document the collection and laboratory analysis of surface soils and groundwater grab samples collected from the Former Eel River Sawmill Specialty Mill located at 2000 Foster Avenue near Arcata, California, the Site. The Site location is shown on Figure 1. The Site plan with sample locations is shown on Figures 2 and Figure 3.

This investigation was performed in accordance with Workplan for Additional Site Investigation prepared by FES dated October 29, 2007, (FES, 2007), and approved in a letter from the California Regional Water Quality Control Board, North Coast Region (RWQCB) dated December 10, 2007.

This report is organized as follows: The Site background is described in Section 2.0. Sampling methods and analysis are included in Section 3.0. Data quality evaluation is presented in Section 4.0. Investigation derived wastes are discussed in Section 5.0 and conclusions are presented in Section 6.0. The references cited in this report are listed in Section 7.0.

2.0 SITE BACKGROUND

A letter from the RWQCB, dated September 11, 2007, indicated that previous investigations performed by the former Site owner, Eel River Sawmills, are considered to be incomplete. The letter required the submittal of a workplan to evaluate if there have been discharges of dioxins into soils in the area of the former teepee burner. The letter also required an evaluation to determine if discharges of petroleum or dissolved metals occurred to the groundwater within ten feet down-gradient from previously identified source areas. A letter from the RWQCB, dated October 22, 2007, included a copy of a September 4, 2007 interoffice memo (Ashley, 2007) that details the Site background, investigation history, Site status and recommendations. Recommendations include a dioxin investigation in the former location of the teepee burner and the collection of groundwater samples in close proximity, in the down-gradient direction of previously identified source areas. Based on a review of the above correspondences from the RWQCB, FES prepared and submitted a workplan for Additional Site Investigation dated October 29, 2007, (FES, 2007). Concurrence with the workplan from the RWQCB was received in a letter dated December, 10, 2007.

2.1 Site Description

Based on information provided in the RWQCB interoffice memo dated September 4, 2007, the Site was open space prior to 1950 and utilized as undeveloped land and pasture. In 1951, it was indicated that the Site was developed into an old growth redwood mill that was operated until 1986 at which time the mill structures were demolished. The current surface of the Site has been relatively undisturbed since the operation of the sawmill as evidenced by the presence of all major foundations at or near current grade, and the presence of facility roads and log deck roads observed on historic aerial photographs. Historic Site features can be seen on historic aerial photographs included in Appendix A.

2.2 Previous Investigations

Numerous previous investigations have been conducted at the Site including:

- 1993, Phase I Environmental Site Assessment by SHN Consulting Engineers & Geologists (SHN);
- 1994, Preliminary Phase II Field Investigation by SHN;
- 1994, 12 backhoe test pits located in the fuel tank area (FTA), septic tank area (STA), vehicle maintenance (VM), debarker area (DB), and the old log deck area (DA);
- 1994, 30 backhoe test pits and four temporary piezometers placed in several; areas including the FTA, VM, DB, DA, the leachfield and at the property boundary;
- 1995, 4-monitoring wells and one temporary piezometer;
- 1996, 15-test pits, 8-soil gas points, 3-well points;
- 1997, soil excavation in three areas (VM, 520 cubic yards), (DB, 420 cubic yards), and (FTA, 1,060 cubic yards); and
- 1998, Site Development Contingency Investigation Plan.

Previous investigations indicated that Site soils and groundwater have been impacted with diesel, motor oil, and gasoline. Metals including chromium, nickel, lead, and zinc were found to be present in Site soils and Site groundwater was indicated to have contained dissolved chromium, nickel, zinc, and lead. Based on groundwater measurements during previous investigations, it was determined that groundwater was generally encountered at a depth of less than 10 feet bgl and that the groundwater gradient was generally to the east (SHN, 1995).

3.0 SAMPLING METHODS AND ANALYSIS

3.1 Surface Soil Sampling

Based on review of a limited number of historic oblique aerial photographs of the Site, included in Appendix A, the location of a former teepee burner and a potential former onsite ash disposal or burn pile area were identified. The locations of the surface soil samples were determined by using current Site features, previous investigation report maps, and historic oblique aerial photographs. To determine if there have been releases of dioxins to the surface soils at the above noted locations, soil sampling was performed at four locations within the footprint of the former teepee burner (SS-2, SS-3, SS-4, and SS-5) as shown on Figures 2 and 3. Two additional surface soil samples were collected in the northern portion of the property. SS-1 was collected in the northwestern corner of the Site in an area considered to be upwind from the former teepee burner and was intended to provide a background sample. SS-6 was collected in an area that appeared to be in the vicinity of a burn pile or possible onsite ash disposal on the 1955 historic photograph (Appendix A).

3.11 Field Methods and Observations

Standard operating procedures used for this investigation are included in Appendix F. Prior to all subsurface field activities, FES contacted Underground Service Alert (USA) to identify all known public utilities in the area of the Site. In addition, FES worked with the Site owner to identify any additional onsite utilities or underground structures. FES acquired a boring permit from Humboldt County included in Appendix B. Surface soil sampling was conducted by excavating a small hole with a clean shovel from 0-0.5 feet below ground level (bgl). The loose material was mixed with a clean gloved hand and directly placed into a laboratory-supplied container. The soil present in the 0-0.5 feet bgl interval generally consisted of very dark grayish-brown silty sand. The soil included some charcoal and debris in the area of the former teepee burner. During excavation of the shallow soil samples in the area of the former teepee burner, it was noted that the surface soil was underlain by a hard baked partially fused sand that may represent the soil altered by high temperatures beneath the former teepee burner. Field delineation of the baked zone appeared to correlate with the estimated extent of the former teepee burner. Sample SS-5 was collected from the top of the baked zone from approximately 0.7 to 0.9 feet bgl and was collected using a clean breaker bar to loosen the material prior to placing it into the jar. The shallow presence of the baked zone suggests that the Site surface in the area of the former teepee burner has been relatively undisturbed since the demolition of the sawmill. The soil present from 0-0.5 feet bgl at the background sample location SS-1 and at the possible onsite ash disposal or burn pile area (SS-6) consisted of very dark grayish brown silty sand.

Surface soil samples were labeled and placed in an ice-cooled chest immediately after collection.

3.12 Chemical Analysis Methods

Surface soil samples were submitted to TestAmerica, Inc. for analysis of dioxins and furans utilizing EPA Method 1613. The chain-of-custody and laboratory report are included in Appendix C.

3.13 Chemical Analysis Results

The results of analysis of shallow soil sample for dioxins and furans are included in Table 1. The results of the dioxin analysis are summarized in the table below. The Toxicity Equivalents (TEQs) presented in this report are based on Toxic Equivalency Factors (TEFs) developed by the World Health Organization (World Health Organization, 2005). TEQs are calculated in two ways. One method of calculating total TEQ is to assume the concentrations of non-detected compounds are zero "TEQ (0)". The second method of calculating total TEQ is to assume that the concentration of the non-detected compounds is equal to half of the detection limit "TEQ (1/2)". TEQs based on both methods are included in the table below. Based on these results, one surface soil sample (SS-2), collected within the estimated footprint of the former teepee burner, exceeded applicable regulatory standards for residential soils.

Sample ID	Date Sampled	Total TEQ (0)	Total TEQ (1/2)
	Units:	(pg/g)	(pg/g)
PRGs-Residential Soil:		3.9	3.9
CHHLS-Residential Land Use:		-	4.6
SS-1	2/8/2008	1.66	2.61
SS-2	2/8/2008	**30.47**	**31.23**
SS-3	2/8/2008	2.66	3.88
SS-4	2/8/2008	0.36	1.37
SS-5	2/8/2008	0.006	0.74
SS-6	2/8/2008	0.38	1.9

3.2 Groundwater Grab Sampling

Groundwater grab samples were collected from temporary wells located within 10 feet in the down-gradient direction of the source areas including the FTA, DB, and VM areas as shown on Figures 2 and 3.

3.21 Field Methods and Observations

Three soil borings were advanced on the Site to allow collection of groundwater grab samples. The locations of the soil borings are shown on Figures 2 and 3. The locations of the soil borings were determined by using current Site features, previous investigation report maps, and historic aerial photographs. Soil boring SB-1 was advanced less than 10 feet east (down-gradient direction) of the former

fuel tank area. Soil boring SB-2 was advanced less than 10 feet east (down-gradient direction) of the former vehicle maintenance area. Soil boring SB-3 was advanced less that 10 feet east (down-gradient direction) of the concrete foundation for the debarker. Groundwater grab samples were collected from temporary wells that were installed with a hand auger. Well construction details and boring logs are included in Appendix D. At soil borings SB-1 and SB-2 the Site subsurface soils consist of silty sands with cobbles to a depth of between 4 and 9 feet bgl. This upper unit is underlain by a stiff very dark gray clay. Due to the cobbles present in the upper portions of the borings, multiple attempts were necessary at most of the sample locations to penetrate the upper layer. A combination of hand auger, shovel, and breaker bar were used to advance the borings. Upon completion of the borings, machine-slotted 0.5 inch diameter PVC casing was placed in the borings followed by sand filter packs. Bentonite pellets were placed at the top of the borings to seal out surface runoff as indicated in the temporary well construction drawings in Appendix E. Temporary soil borings SB-1 and SB-3 were advanced on February 6, 2008 and SB-3 was advanced on February 7, 2008. At the time of temporary well installation, a check-valve attached to the end of dedicated tubing was used to remove sediment from the temporary wells. Temporary wells were sampled on February 7, 2008. Prior to groundwater sampling a peristaltic pump was used to purge the temporary wells. Groundwater grab samples were placed in laboratory-supplied containers. Groundwater samples collected for dissolved metals were filtered and preserved at the laboratory on the day of sample collection. Following sampling, the temporary wells were destroyed by removing the casing, removing the well construction materials with a hand auger, and then filling with bentonite pellets from bottom to top.

3.22 Chemical Analysis Methods

Groundwater grab samples were submitted for analysis at North Coast Laboratories, LTD. The groundwater samples were analyzed for the following:

- Groundwater samples were analyzed for Total Petroleum Hydrocarbons (TPH) as gasoline and BTEX using EPA Method 8260B;
- Groundwater samples were analyzed for Total Petroleum Hydrocarbons (TPH) as diesel and motor oil using EPA Method 8015DRO with silica gel cleanup; and
- Groundwater samples were analyzed for dissolved metals including cadmium, chromium, nickel, lead, and zinc using EPA Method 6010.

3.23 Chemical Analysis Results

The results of the analysis of groundwater grab samples are summarized in Table 2. There were no detections of any petroleum compounds including diesel, motor oil or gasoline. None of the gasoline components including benzene, toluene, ethylbenzene, or xylenes were detected.

Dissolved cadmium and lead were not detected in any of the groundwater grab samples. Dissolved chromium was detected in all three groundwater grab samples ranging in concentration from 9.7 to 24 micrograms per liter (µg/L) which is less than the applicable regulatory limits referenced in Table 2. Dissolved zinc was detected in the groundwater grab sample at a concentration of 26 µg/L which is less than the applicable regulatory limits. Dissolved nickel was detected in all three groundwater grab samples ranging in concentration from 18 to 26 µg/L. The water quality objective for dissolved nickel is 12 µg/L, (California Public Health Goal (PHG) in drinking water). Dissolved nickel from all three of the groundwater samples exceeded the above PHG for drinking water. Nickel is known to be present in the soils at the Site ranging from 29 to 110 mg/kg. This concentration range is within the range of documented background concentrations in California soils (Bradford et.al,1996). Under certain groundwater conditions, naturally occurring metals in soils can be mobilized into the groundwater. The relatively low concentrations of dissolved nickel in the groundwater are likely due to leaching of naturally occurring nickel from the soils at the Site.

4.0 DATA QUALITY EVALUATION

FES reviewed the laboratory analytical reports to determine if there are any data quality issues. All holding times were met. There were no detections of analytes in the laboratory method blanks except for trace concentrations of chromium (0.60 µg/L) and (nickel (0.21 µg/L). Chromium and nickel detections in samples were an order of magnitude greater than what was detected in the method blank and therefore the chromium and nickel results are considered valid. In all cases the laboratory control spike (LCS) and matrix spikes were within acceptable limits. The laboratory data is considered to be valid.

5.0 INVESTIGATION DERIVED WASTES

All investigation-derived wastes including soil cuttings, redrilled well materials, purge water and decontamination water were retained and are being stored in labeled DOT-approved 55-gallon drums at a secured DANCO-owned equipment yard awaiting disposal. Investigation-derived wastes consist of one drum of solids and one drum of liquids. Based on the enclosed analytical data from the investigation, the waste is considered to be non-hazardous and will be disposed following all appropriate rules and regulations. Documentation of disposal will be provided under a separate cover letter.

6.0 CONCLUSIONS

Based on the results of this investigation, petroleum compounds including gasoline, diesel and motor oil, were not detected in the groundwater grab samples collected from the areas of concern. Dissolved metals including chromium, nickel, and zinc detected in the groundwater grab samples is likely due to the leaching of background concentrations of metals from onsite soils. One soil sample (SS-2) was found to have a Dioxin/furan TEQ exceeding applicable residential regulatory standards.

7.0 REFERENCES

Ashley, 2007, *California Regional Water Quality Control Board North Coast Region Interoffice Memo, Site Review, Eel River Sawmill Specialty Mill, 2000 Foster Avenue, Arcata, California*, September 4.

Bradford et.al, 1996, *Background concentrations of Trace Major Elements in California Soils, Kearney Foundation Special Report, UC-Riverside and CAL-EPA, March.*

California Environmental Protection Agency, 2005, *Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties*, January 2005.

FES, 2007, *Workplan for Additional Site investigation, Former Eel River Sawmill Specialty Mill, 2,000 Foster Avenue, Arcata, CA*: October 29.

SHN Consulting Engineers & Geologists, Inc. (SHN), 1995*, Initial Groundwater Investigation Report of Findings for 2000 Foster Avenue, Arcata, California*: August.

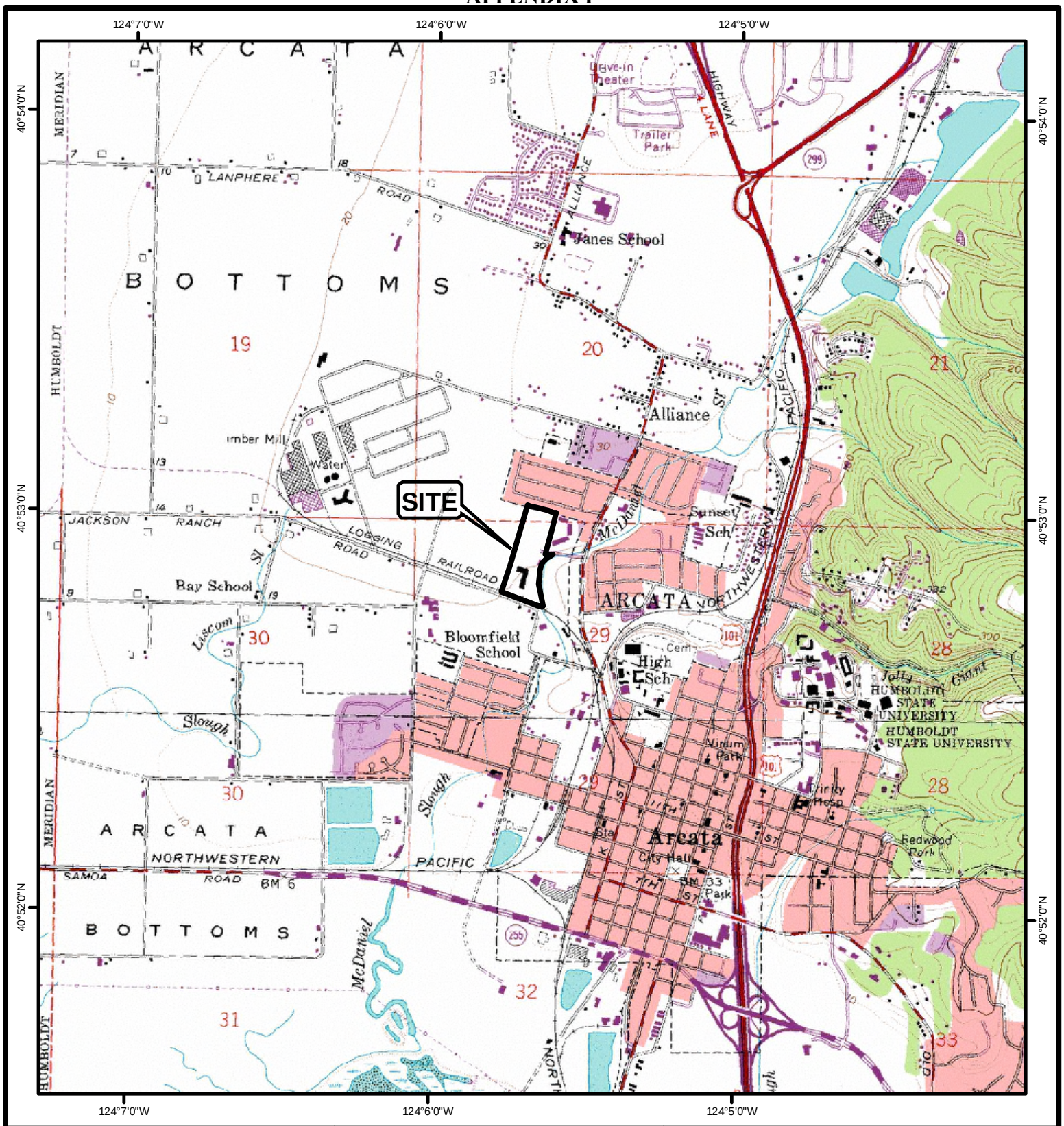
U.S. Environmental Protection Agency Region 9, 2004, *Preliminary Remediation Goals*.

World Health Organization, 2005, *The 2005 World Health Organization Re-evaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds.*

APPENDIX P

FIGURES

APPENDIX P



EXPLANATION

All Locations Approximate

Base Image Data Source:
1:24,000 Digital Raster Graph Mosaic of Humboldt County, California

N
W E
S

Feet
0 500 1,000 2,000 3,000 4,000

Foster Ave. LLC

Figure 1
Site Location Map
2000 Foster Avenue
Arcata, California

Freshwater Environmental Services

Date: 2-28-08	Project No.: 113-07
By: SJT	Checked: OWP

EXPLANATION

- Boring Location
- Approximate Parcel Boundary

All Locations Approximate

Base Image Data Source:
City of Arcata Aerial Imagery, 2003

Feet
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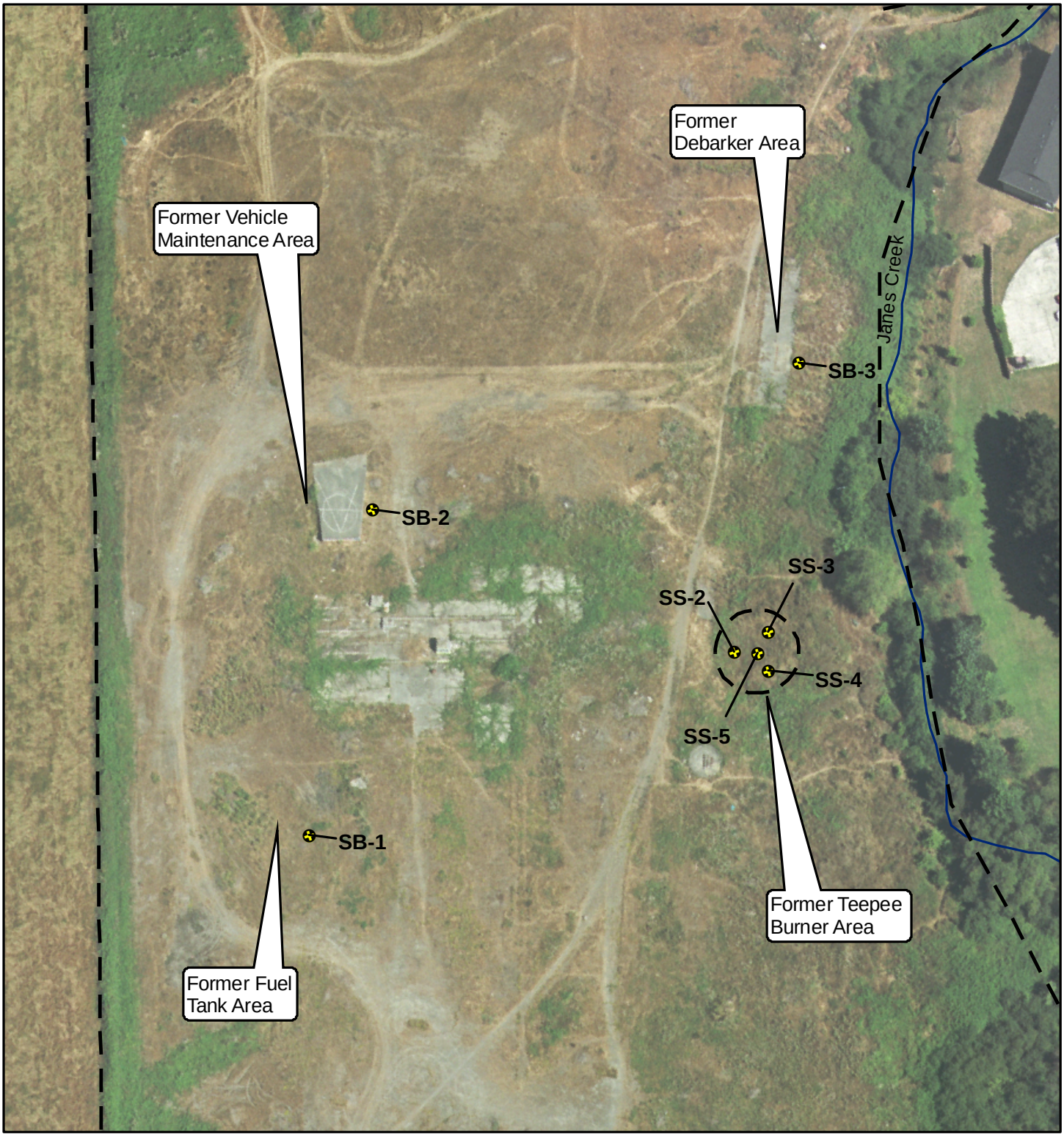
Foster Ave. LLC

Figure 2

Boring Locations

Freshwater Environmental Services

Date: 2-28-08	Project No.: 113-07
By: SJT	Checked: OWP



N
W E
S

Feet
0 1020 40 60 80 100 120 140

EXPLANATION

Boring Location

Approximate Parcel Boundary

All Locations Approximate

Base Image Data Source:
City of Arcata Aerial Imagery, 2003

Foster Ave. LLC

Figure 3
Boring Locations and Approximate Location of Former Teepee Burner

Freshwater Environmental Services

Date: 2-28-08	Project No.: 113-07
By: SJT	Checked: OWP

APPENDIX P

TABLES

TABLE 1
SUMMARY OF CHEMICAL ANALYSES OF SURFACE SOIL SAMPLES
Former Eel River Sawmill Specialty Mill
2000 Foster Avenue
Near Arcata California

Sample ID	Date Sampled	2,3,7,8-TCDD	1,2,3,7,8-PeCDD	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,7,8,9-HxCDD	1,2,3,4,6,7,8-HpCDD	OCDD	2,3,7,8,-TCDF	1,2,3,7,8,-PeCDF	2,3,4,7,8-PeCDF	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDF	2,3,4,6,7,8-HxCDF	1,2,3,7,8,9-HxCDF	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	OCDF	Total TEQ (0)	Total TEQ (1/2)
	Units:	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	-	-
PRGs-Residential Soil:		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**3.9**	**3.9**
CHHLS-Residential Land Use:		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**4.6**
SS-1	2/8/2008	1.2 J JA	<0.75	<2.1	<2.3	<2.3	28	150	0.93 J CON	<0.44	<0.52	<0.72	<0.64	<0.59	<0.64	4.4 J JA	<0.88	9.5 J	1.66	2.61
SS-2	2/8/2008	1.9	11	8.1 J	75	39	460	1000	2.9 CON	<1.6	<2.1	<3.6	<1.4	<2.5	<0.56	16	<1.1	18	**30.47**	**31.23**
SS-3	2/8/2008	1.5	<1.3	<0.89	3.7 J	<2.9	49	310	0.85 J CON	<0.82	<0.94	<1.6	<0.94	<1.6	<0.34	11	<0.61	22	2.66	3.88
SS-4	2/8/2008	<0.43	<0.7	<0.79	<1.6	<1.2	21	120	<0.45 CON	<0.45	<0.54	<0.7	<0.52	<0.81	<0.54	11	<1.2	12 J	0.36	1.37
SS-5	2/8/2008	<0.28	<0.53	<0.44	<0.5	<0.5	4.5 J	22	<0.46 CON	<0.3	<0.33	<0.72	<0.32	<0.46	<0.32	<3	<0.85	<3.1	0.06	0.74
SS-6	2/8/2008	<0.61	<1.4	<2.1	<2.4	<1.7	28	150	<0.69 CON	<0.35	<0.47	<0.59	<0.44	<0.38	<0.25	4.7 J	<0.5	11 J	0.38	1.9

Notes:

- Not applicable.
PRGs USEPA Region 9 Preliminary Remediation Goals (October 2004).
CHHSLs California Human Health Screening Levels (January 2005).
pg/g Picograms per gram or parts per trillion.
ND Analyte not detected at or above the report limit.
TEF Toxicity Equivalency Factors, WHO, 2005
TEQ (0) Total TEQs calculated with none detections calculated as zero.
TEQ (1/2) Total TEQs calculated with none detections calculated as 1/2 the minimium detection limits.
J Analyte detected below the reporting limit, estimated result.
JA Analyte positively identified, but the quantitation is an estimate.
CON Confirmation analysis.

Dioxins and furans analyzed using EPA Method 1613B.

TABLE 2
SUMMARY OF CHEMICAL ANALYSES OF GROUNDWATER
GRAB SAMPLES
Former Eel River Sawmill Specialty Mill
2000 Foster Avenue
Near Arcata California

SOIL BORING	DATE	Petroleum			Gasoline Compounds					Dissolved Metals				
		GASOLINE	DIESEL	MOTOR OIL	Methyl tert-butyl ether (MTBE)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Cadmium	Chromium	Lead	Nickel	Zinc
ID	SAMPLED	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
	WQO	5 [a]	56 [b]	1.0 [c]	5 [d]	0.15 [e]	40 [f]	29 [a]	17 [a]	0.04 [e]	50 [g]	2 [e]	12 [e]	55 h
SB-1	07-Feb-08	<50	<50	<170	<1.0	<0.5	<0.5	<1.0	<1.0	<5.0	24	<5.0	**26**	26
SB-2	07-Feb-08	<50	<50	<170	<1.0	<0.5	<0.5	<1.0	<1.0	<5.0	9.7	<5.0	**19**	<10
SB-3	07-Feb-08	<50	<50	<170	<1.0	<0.5	<0.5	<1.0	<1.0	<5.0	10	<5.0	**18**	<10

Notes:

a Odor and taste threshold (Basin Plan).
b US EPA Integrated Risk Information System (IRIS) reference dose as drinking water level.
c US EPA health advisory Suggested No Adverse Response Level (SNARL), applied to TOXICITY water
d California Department of Public Health (CDPH) secondary MCL.
e California Public Health Goal (PHG) in drinking water, Office of Environmental Health Hazard Assessment (OEHHA).
f US EPA secondary MCL.
g California Department of Public Health (CDPH) primary MCL.
h California Proposition 65 Safe Harbor Level (OEHHA) as drinking water (1-in-1,000,000 cancer risk).

APPENDICES

APPENDIX A

Historic Aerial Photographs

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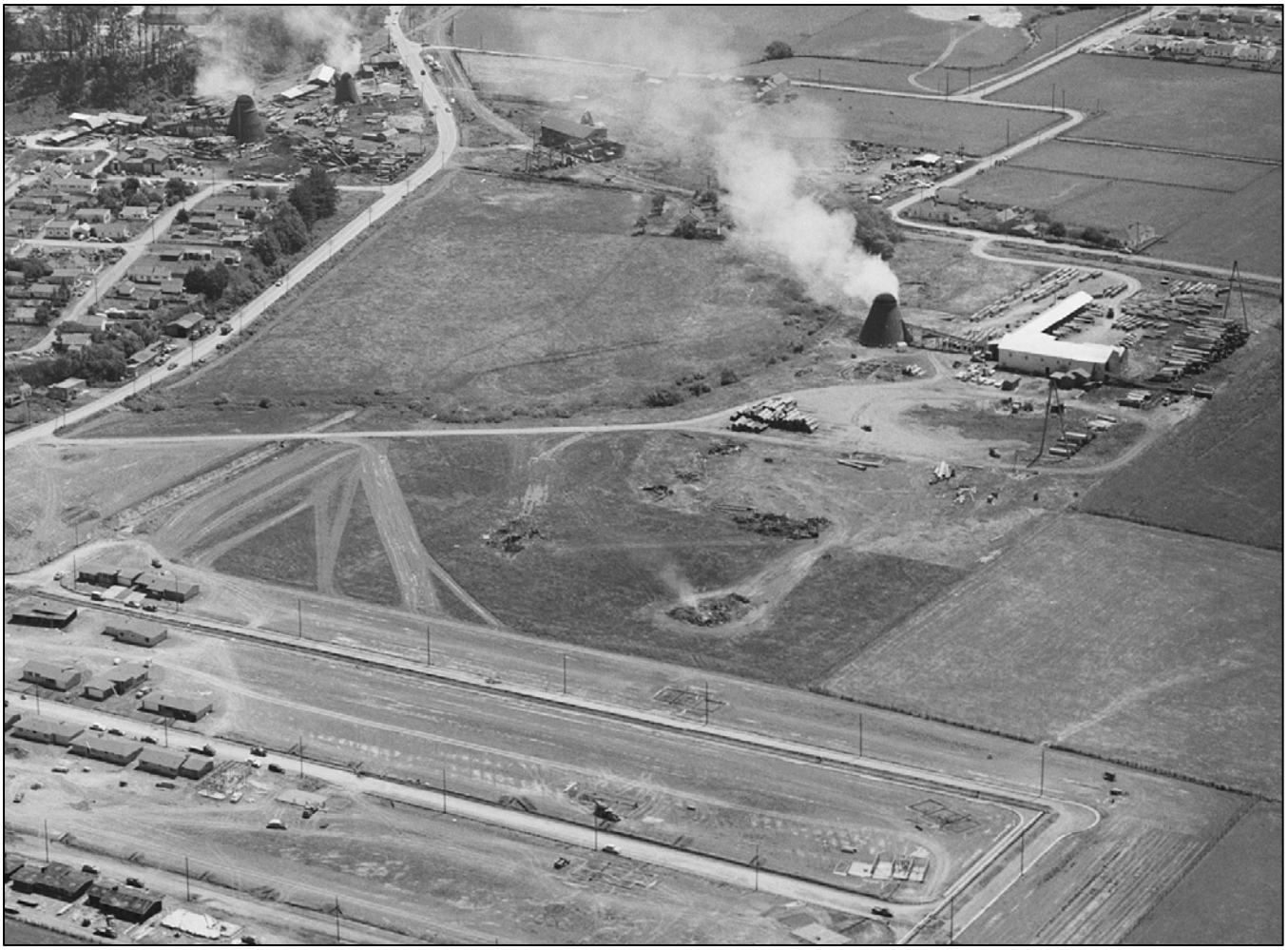
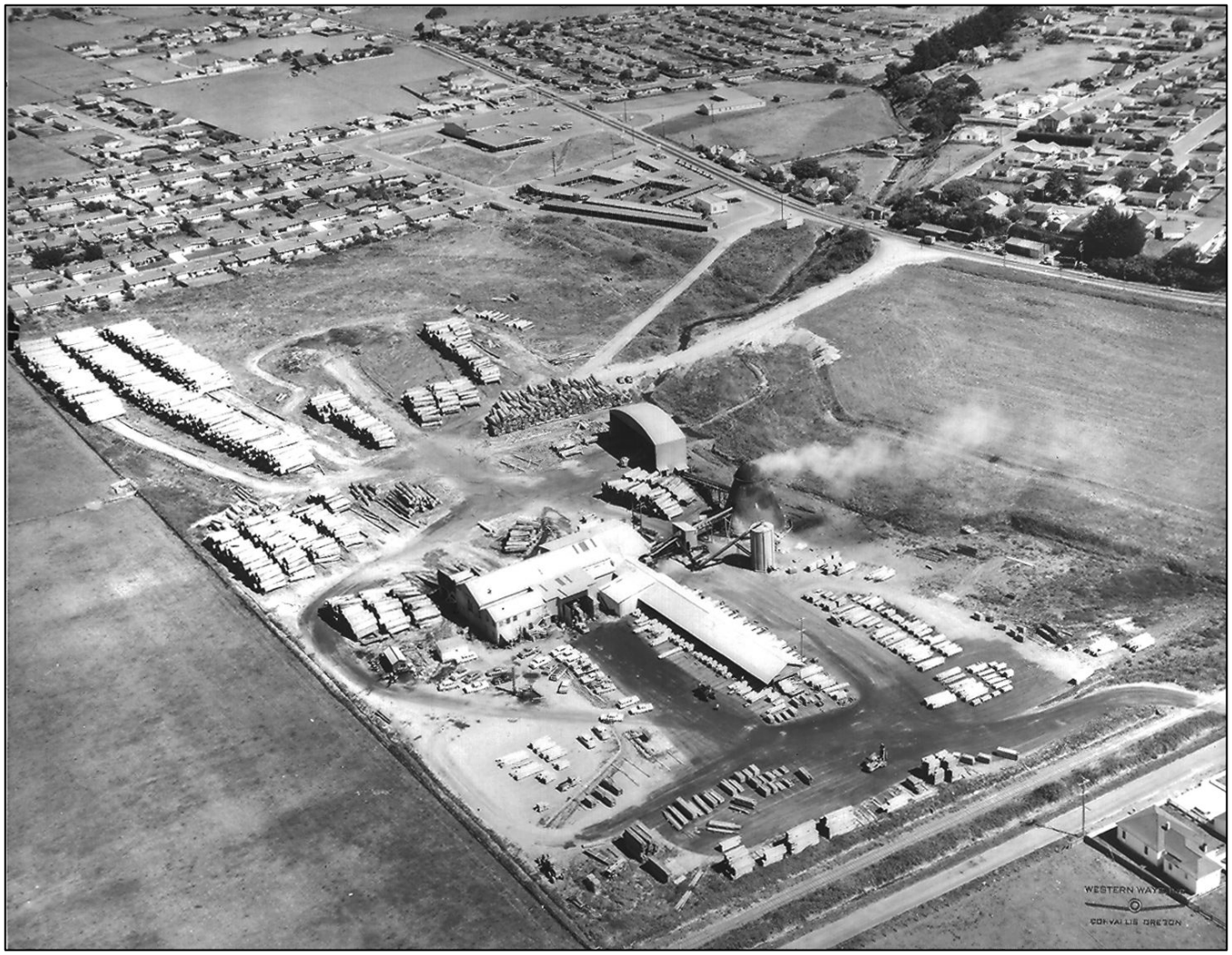


Historical oblique aerial photograph obtained in digital format from Humboldt State University Photograph Collection (Schuster Collection, Photo ID: 2001.01.2208) and cropped to Site area. Photograph dated 7/27/1955.

APPENDIX P



Historical oblique aerial photograph obtained in digital format from California Regional Water Quality Control Board, North Coast Region (RWQCB) titled VanDeNorLumberArcata.

APPENDIX B

Humboldt County Boring Permit

APPENDIX P

HUMBOLDT COUNTY DIVISION of ENVIRONMENTAL HEALTH - HAZARDOUS MATERIALS UNIT
WELL and BORING PERMIT APPLICATION

Facility ID # 1NHU518 Permit # 697-E

Facility Name: Former Eel River Sawmill Specialty Mill
Site Address: 2000 Foster Avenue Arcata, California

Site Owner: Danco Group Telephone: 707-822-9000
Address: 5251 Erickson Way Arcata, California APN: 505-161-11

RP Name: Danco Group Telephone: 707-269-7553
Address: 5251 Erickson Way Arcata, California

Consultant: Freshwater Environmental Services, Stan Thiesen Telephone: (707) 839-0091
Address: 1372 Anderson McKinleyville, California 95519 Reg.#/Type: P.G. #7990

Driller: Hand Auger by Freshwater or direct Push by Fisch Environmental Telephone: (209) 772-3570
Address: 399 Sheri's Place Valley Springs, California 95252 C-57 Lic.#: 683865

# On-site		# Off-site	
Wells	Borings 7	Wells	Borings

Activity: ☒ Construct ☐ Destroy ☐ Repair/Modify Electrode Type:

Well Type: ☐ Monitoring Well ☐ Injection Well ☐ Vapor Extraction ☐ Geologic Boring
☐ Extraction Well ☐ Piezometer ☐ Vapor Point ☐ Soil Gas Survey
☐ Vadose Well ☐ Cathodic Protection ☒ Direct Push Boring ☒ Temporary Well Point

Investigation Type: ☒ Site Assessment ☐ Disposal Practice ☐ UST ☐ Other*
☐ Surface Contamination ☐ Surface Impoundment ☐ AST
*Specify:

Investigation Phase: ☐ Initial ☒ Subsequent ☐ Remediation ☐ Closure

Suspected Contaminants: Petroleum compounds, metals and dioxin/furan

Disposal/Containment for Soil Cuttings: 55-gallon DOT drum
Disposal/Containment for Rinsate: 55-gallon DOT drum
Disposal/Containment for Development Water: 55-gallon DOT drum

Permits will not be processed with out the following information:

☐ Sealed Construction Detail ☒ Appropriate Fees
☒ Detailed Site Plan ☒ Copy of Workplan (if not on file at HCDEH)
☒ Lead Agency Approval Letter
☐ Off Site Well Requirements:
☐ Legal Right of Entry Proposed Work Date: December 13, 2007
☐ Off Site A
☐ Encroachi
☐ Coastal Z

County of Humboldt Dept of Health & Human Services
Public Health Branch

240381

DATE	NAME	CASH	CHECK
12/10/2007	Freshwater Environmental		147 34

☐ CLINIC Construct 7 borings #2051
☐ EN. HEALTH former Eel River Sawmill Special
☐ LAB 2000 Foster Ave Arcata, CA
☐ OTHER file # 697, RB case # 1NHU518

AMOUNT OF ACCT.		
AMOUNT PAID		
BAL. DUE		

Received By Jamie Kurt

APPENDIX P

HUMBOLDT COUNTY DIVISION of ENVIRONMENTAL HEALTH - HAZARDOUS MATERIALS UNIT
WELL and BORING PERMIT APPLICATION

Facility ID # 1NHU518 **Permit #** 1NHU518

I hereby agree to comply with all laws, ordinances and regulations of the county of Humboldt and State of California pertaining to water well construction. I will contact the Humboldt County Hazardous Materials Unit at (707) 445-6215 five (5) working days prior to commencing this work. I will furnish to the County of Humboldt, Division of Environmental Health, and the owner a legible copy of the State Water Well Completion Report (form DWR 188) within fifteen (15) days after completion of work to obtain final approval of the well(s). I acknowledge that the application will become a permit ONLY after site approval by the Local Implementing Agency (HCDEH, NCRWQCB, DTSC, EPA). I understand this permit is not transferable and expires one hundred twenty (120) days from the date of issuance.

Certificates of Insurance:

☑ A currently effective General Liability Certificate of Insurance is on file with this office, endorsed to include the Humboldt County Division of Environmental Health as additional named insured.

☑ A currently effective Worker's Compensation Certificate of Insurance is on file with this office, endorsed to include the Humboldt County Division of Environmental Health as additional named insured.

Signature of Well Driller - no proxies - original signature only in blue ink _____ Date _____

- **Well identification number and type must be affixed to exterior surface of security structure.**
- **The applicant is responsible for notifying Underground Services Alert at least 48 hours prior to the scheduled work date.**
- **A State of California Department of Water resources Well Completion Report (Form DWR 1-88) must be filed within 15 days of completion of work for all well completions and destructions.**
- **A licensed California C-57 Well Driller is required for all wells and direct push work.**

FOR OFFICE USE ONLY

Permit Approval: Norman Crawford **Date:** 12/10/2007

Fee: $147.34 **Date:** 12/10/2007 **Receipt:** 240381

Initial Inspection: _____ **Date:** _____

Final Inspection: _____ **Date:** _____

APPENDIX C

Laboratory Reports and Chain-of-Custody Records

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

February 27, 2008

TestAmerica Project Number: G8B120224
PO/Contract:

Orrin Plocher
Freshwater Environmental Service
1372 Anderson Avenue
McKinleyville, CA 95519

Dear Mr. Plocher,

This report contains the analytical results for the samples received under chain of custody by TestAmerica on February 12, 2008. These samples are associated with your Foster Ave. project.

The test results in this report meet all NELAC requirements for parameters that accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The case narrative is an integral part of this report.

If you have any questions, please feel free to call me at (916) 374-4383.

Sincerely,

David R. Alltucker
Project Manager

Table of Contents

TestAmerica West Sacramento Project Number G8B120224

Case Narrative

Quality Assurance Program

Sample Description Information

Chain of Custody Documentation

SOLID, 1613B, Dioxins/Furans, HRGC/HRMS
Samples: 1, 2, 3, 4, 5, 6
- Sample Data Sheets
- Method Blank Report
- Laboratory QC Reports

SOLID, D 2216-90, Percent Moisture
Samples: 1, 2, 3, 4, 5, 6
- Sample Data Sheets
- Laboratory QC Reports

Case Narrative

TestAmerica West Sacramento Project Number G8B120224

SOLID, 1613B, Dioxins/Furans, HRGC/HRMS
Sample(s): 1, 2, 3, 4, 5, 6
The result for 2, 3, 7, 8-TCDF is reported from the confirmation analysis that occurred on February 22, 23 and 25, 2008.

Sample(s): 1
The isomers 2,3,7,8-TCDF and 1,2,3,4,6,7,8-HpCDF have been qualified with the "JA" flag due to the ion abundance ratios being outside of criteria. The isomers have been reported as an "estimated maximum possible concentration" (EMPC) because the quantitation is based on the theoretical ion abundance ratios for these analytes.

There were no other anomalies associated with this project.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ACCREDITED IN ACCORDANCE WITH nelac

TestAmerica Laboratories West Sacramento Certifications/Accreditations

Certifying State	Certificate #	Certifying State	Certificate #
Alaska	UST-055	New York*	11666
Arizona	AZ0616	Oregon*	CA 200005
Arkansas	04-067-0	Pennsylvania	68-1272
California*	01119CA	South Carolina	87014002
Colorado	NA	Texas	TX 270-2004A
Connecticut	PH-0691	Utah*	QUAN1
Florida*	E87570	Virginia	00178
Georgia	960	Washington	C087
Hawaii	NA	West Virginia	9930C, 334
Kansas*	E10375	Wisconsin	998204680
Louisiana*	01944	NFESC	NA
Michigan	9947	USACE	NA
Nevada	CA44	USDA Foreign Plant	37-82605
New Jersey*	CA005	USDA Foreign Soil	S-46613

*NELAP accredited. A more detailed parameter list is available upon request. Updated 9/21/07

QC Parameter Definitions

QC Batch: The QC batch consists of a set of up to 20 field samples that behave similarly (i.e., same matrix) and are processed using the same procedures, reagents, and standards at the same time.

Method Blank: An analytical control consisting of all reagents, which may include internal standards and surrogates, and is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background contamination.

Laboratory Control Sample and Laboratory Control Sample Duplicate (LCS/LCSD): An aliquot of blank matrix spiked with known amounts of representative target analytes. The LCS (and LCSD as required) is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects. If an LCSD is performed, it may also be used to evaluate the precision of the process.

Duplicate Sample (DU): Different aliquots of the same sample are analyzed to evaluate the precision of an analysis.

Surrogates: Organic compounds not expected to be detected in field samples, which behave similarly to target analytes. These are added to every sample within a batch at a known concentration to determine the efficiency of the sample preparation and analytical process.

Matrix Spike and Matrix Spike Duplicate (MS/MSD): An MS is an aliquot of a matrix fortified with known quantities of specific compounds and subjected to an entire analytical procedure in order to indicate the appropriateness of the method for a particular matrix. The percent recovery for the respective compound(s) is then calculated. The MSD is a second aliquot of the same matrix as the matrix spike, also spiked, in order to determine the precision of the method.

Isotope Dilution: For isotope dilution methods, isotopically labeled analogs (internal standards) of the native target analytes are spiked into the sample at time of extraction. These internal standards are used for quantitation, and monitor and correct for matrix effects. Since matrix effects on method performance can be judged by the recovery of these analogs, there is little added benefit of performing MS/MSD for these methods. MS/MSD are only performed for client or QAPP requirements.

Control Limits: The reported control limits are either based on laboratory historical data, method requirements, or project data quality objectives. The control limits represent the estimated uncertainty of the test results.

Sample Summary

TestAmerica West Sacramento Project Number G8B120224

WO#	Sample #	Client Sample ID	Sampling Date	Received Date
KG0X6	1	SS-1	2/8/2008 11:05 AM	2/12/2008 08:45 AM
KG0X7	2	SS-2	2/8/2008 09:50 AM	2/12/2008 08:45 AM
KG0X9	3	SS-3	2/8/2008 09:55 AM	2/12/2008 08:45 AM
KG00D	4	SS-4	2/8/2008 09:45 AM	2/12/2008 08:45 AM
KG00E	5	SS-5	2/8/2008 09:35 AM	2/12/2008 08:45 AM
KG00F	6	SS-6	2/8/2008 11:00 AM	2/12/2008 08:45 AM

Notes(s):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity, pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight

G8B120224

Chain of Custody Record

SEVERN TRENT **STL**

Severn Trent Laboratories, Inc.

STL-4124 (0901) Sean Armstrong (707) 822-9000 ext 585

Client	Project Manager	Date	Chain of Custody Number
Foster Avenue, LLC	Orrin Plocher	2/8/08	346214
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page 1 of 1**
5251 Ericson Way	707-839-0091		
City / State / Zip Code	**Site Contact**	**Lab Contact**	
Arcata / CA / 95521	Orrin Plocher	D. Altucker	
Project Name and Location (State)	**Carrier/Waybill Number**		
Foster Avenue Arcata, California	8636 0737 1682		
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis: EPA 1613	Special Instructions/ Conditions of Receipt
SS-1	2/8/08	1105				✓	✓						✓	EPA 1613
SS-2		950				✓	✓						✓	Dioxins/furans
SS-3		955				✓	✓						✓	
SS-4		945				✓	✓						✓	
SS-5		935				✓	✓						✓	
SS-6	↓	1100				✓	✓						✓	

Possible Hazard Identification

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown

Sample Disposal

☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required

☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☒ 21 Days ☐ Other _____

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By: Orrin Plocher	2/11/08	900	1. Received By: Chen	2/12/08	0930
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

TestAmerica West Sacramento (916) 373 - 5600

APPENDIX P

APPENDIX P

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

LOT RECEIPT CHECKLIST
TestAmerica West Sacramento

CLIENT Foster Avenue, LLC. PM DA LOG # 50345

LOT# (QUANTIMS ID) G8B120224 QUOTE# 17411 LOCATION W15A

		Initials	Date
DATE RECEIVED	2/12/08 TIME RECEIVED 0845	QV	2/12/08
DELIVERED BY	☑ FEDEX ☐ CA OVERNIGHT ☐ CLIENT ☐ AIRBORNE ☐ GOLDENSTATE ☐ DHL ☐ UPS ☐ BAX GLOBAL ☐ GO-GETTERS ☐ TAL COURIER ☐ VALLEY LOGISTICS ☐ MORGAN HILL COURIER ☐ OTHER		
CUSTODY SEAL STATUS	☐ INTACT ☐ BROKEN ☑ N/A		
CUSTODY SEAL #(S)			
SHIPPPING CONTAINER(S)	☑ TAL ☐ CLIENT ☐ N/A		
TEMPERTURE RECORD (IN °C)	IR 4 ☑ 5 ☐ ☐ OTHER		
COC #(S)	340214		
TEMPERATURE BLANK	Observed: NA Corrected:		
SAMPLE TEMPERATURE Observed:	1 5 2 Average: 3 Corrected Average: 3		
COLLECTOR'S NAME:	☐ Verified from COC ☑ Not on COC		
pH MEASURED	☐ YES ☐ ANOMALY ☑ N/A		
LABELED BY			
LABELS CHECKED BY			
PEER REVIEW	☑ NA		
SHORT HOLD TEST NOTIFICATION	SAMPLE RECEIVING		
	WETCHEM ☑ N/A		
	VOA-ENCORES ☑ N/A		
☐ METALS NOTIFIED OF FILTER/PRESERVE VIA VERBAL & EMAIL	☑ N/A		
☑ COMPLETE SHIPMENT RECEIVED IN GOOD CONDITION WITH APPROPRIATE TEMPERATURES, CONTAINERS, PRESERVATIVES	☐ N/A		
☐ CLOUSEAU	☐ TEMPERATURE EXCEEDED (2 °C – 6 °C)*1 ☑ N/A		
☐ WET ICE	☐ BLUE ICE ☐ GEL PACK ☐ NO COOLING AGENTS USED ☐ PM NOTIFIED		

Notes:

*1 Acceptable temperature range for State of Wisconsin samples is≤4°C.

LEAVE NO SPACES BLANK. USE "N/A" IF NOT APPLICABLE.

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TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

APPENDIX P

Bottle Lot Inventory

Lot ID: G8B120224

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
VOA*																				
VOAh*																				
AGB																				
AGBs																				
250AGB																				
250AGBs																				
250AGBn																				
500AGB																				
___AGJ																				
500AGJ																				
250AGJ																				
125AGJ																				
___CGJ																				
500CGJ																				
250CGJ																				
125CGJ																				
PJ																				
PJn																				
500PJ																				
500PJn																				
500PJna																				
500PJzn/na																				
250PJ																				
250PJn																				
250PJna																				
250PJzn/na																				
Acetate Tube																				
____"CT																				
Encore																				
Folder/filter																				
PUF																				
Petri/Filter																				
XAD Trap																				
Ziploc																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

h = hydrochloric acid s = sulfuric acid na = sodium hydroxide n = nitric acid zn = zinc acetate

Number of VOAs with air bubbles present / total number of VOA's

QA-185 5/05 EM

Page 3

LEAVE NO SPACES BLANK. USE "NA" IF NOT APPLICABLE.

SOLID, 1613B, Dioxins/Furans, HRGC/HRMS

APPENDIX P
Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi
Client Sample ID: SS-1
Dioxin

Lot-Sample #:	G8B120224-1	**Work Order #:**	KG0X61AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	34
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

PARAMETER	RESULT	DETECTION LIMIT	*TEF FACTOR	TEQ CONCENTRATION
Dioxins/Furans, HRGC/HRMS (1613B)				
2,3,7,8-TCDF	0.93 J CON	0	0.1	0.09
Total TCDF	10	0		
2,3,7,8-TCDD	1.2 J JA	0	1	1.2
Total TCDD	10	0		
1,2,3,7,8-PeCDF	ND	0.44	0.03	0.01
2,3,4,7,8-PeCDF	ND	0.52	0.3	0.08
Total PeCDF	ND	2.4		
1,2,3,7,8-PeCDD	ND	0.75	1	0.38
Total PeCDD	4.8	0		
1,2,3,4,7,8-HxCDF	ND	0.72	0.1	0.04
1,2,3,6,7,8-HxCDF	ND	0.64	0.1	0.03
2,3,4,6,7,8-HxCDF	ND	0.59	0.1	0.03
1,2,3,7,8,9-HxCDF	ND	0.64	0.1	0.03
Total HxCDF	ND	2.7		
1,2,3,4,7,8-HxCDD	ND	2.1	0.1	0.11
1,2,3,6,7,8-HxCDD	ND	2.3	0.1	0.12
1,2,3,7,8,9-HxCDD	ND	2.3	0.1	0.12
Total HxCDD	22	0		
1,2,3,4,6,7,8-HpCDF	4.4 J JA	0	0.01	0.04
1,2,3,4,7,8,9-HpCDF	ND	0.88	0.01	0
Total HpCDF	13	0		
1,2,3,4,6,7,8-HpCDD	28	0	0.01	0.28
Total HpCDD	55	0		
OCDF	9.5 J	0	0.0003	0
OCDD	150	0	0.0003	0.05
Total TEQ Concentration				**2.61**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
13C-2,3,7,8-TCDF	89	24 - 169
13C-2,3,7,8-TCDD	89	25 - 164
13C-1,2,3,7,8-PeCDF	93	24 - 185
13C-2,3,4,7,8-PeCDF	97	21 - 178
13C-1,2,3,7,8-PeCDD	93	25 - 181
13C-1,2,3,4,7,8-HxCDF	101	26 - 152
13C-1,2,3,6,7,8-HxCDF	97	26 - 123
13C-2,3,4,6,7,8-HxCDF	102	28 - 136
13C-1,2,3,7,8,9-HxCDF	97	29 - 147
13C-1,2,3,4,7,8-HxCDD	102	32 - 141
13C-1,2,3,6,7,8-HxCDD	94	28 - 130
13C-1,2,3,4,6,7,8-HpCDF	87	28 - 143

Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi

Client Sample ID: SS-1

Dioxin

Lot-Sample #:	G8B120224-1	**Work Order #:**	KG0X61AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	34
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

13C-1,2,3,4,7,8,9-HpCDF	95	26 - 138
13C-1,2,3,4,6,7,8-HpCDD	99	23 - 140
13C-OCDD	107	17 - 157

SURROGATE STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
37Cl4-2,3,7,8-TCDD	90	35 - 197

* TEF - WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

APPENDIX P
Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi
Client Sample ID: SS-2
Dioxin

Lot-Sample #:	G8B120224-2	**Work Order #:**	KG0X71AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	44
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

PARAMETER	RESULT	DETECTION LIMIT	*TEF FACTOR	TEQ CONCENTRATION
Dioxins/Furans, HRGC/HRMS (1613B)				
2,3,7,8-TCDF	2.9 CON	0	0.1	0.29
Total TCDF	43	0		
2,3,7,8-TCDD	1.9	0	1	1.9
Total TCDD	32	0		
1,2,3,7,8-PeCDF	ND	1.6	0.03	0.02
2,3,4,7,8-PeCDF	ND	2.1	0.3	0.32
Total PeCDF	6.7	0		
1,2,3,7,8-PeCDD	11	0	1	11
Total PeCDD	89	0		
1,2,3,4,7,8-HxCDF	ND	3.6	0.1	0.18
1,2,3,6,7,8-HxCDF	ND	1.4	0.1	0.07
2,3,4,6,7,8-HxCDF	ND	2.5	0.1	0.13
1,2,3,7,8,9-HxCDF	ND	0.56	0.1	0.03
Total HxCDF	13	0		
1,2,3,4,7,8-HxCDD	8.1 J	0	0.1	0.81
1,2,3,6,7,8-HxCDD	75	0	0.1	7.5
1,2,3,7,8,9-HxCDD	39	0	0.1	3.9
Total HxCDD	460	0		
1,2,3,4,6,7,8-HpCDF	16	0	0.01	0.16
1,2,3,4,7,8,9-HpCDF	ND	1.1	0.01	0.01
Total HpCDF	36	0		
1,2,3,4,6,7,8-HpCDD	460	0	0.01	4.6
Total HpCDD	780	0		
OCDF	18	0	0.0003	0.01
OCDD	1000	0	0.0003	0.3
Total TEQ Concentration				**31.23**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
13C-2,3,7,8-TCDF	84	24 - 169
13C-2,3,7,8-TCDD	88	25 - 164
13C-1,2,3,7,8-PeCDF	86	24 - 185
13C-2,3,4,7,8-PeCDF	92	21 - 178
13C-1,2,3,7,8-PeCDD	87	25 - 181
13C-1,2,3,4,7,8-HxCDF	99	26 - 152
13C-1,2,3,6,7,8-HxCDF	98	26 - 123
13C-2,3,4,6,7,8-HxCDF	100	28 - 136
13C-1,2,3,7,8,9-HxCDF	97	29 - 147
13C-1,2,3,4,7,8-HxCDD	96	32 - 141
13C-1,2,3,6,7,8-HxCDD	101	28 - 130
13C-1,2,3,4,6,7,8-HpCDF	94	28 - 143

APPENDIX P
Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi
Client Sample ID: SS-2

Dioxin

Lot-Sample #:	G8B120224-2	**Work Order #:**	KG0X71AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	44
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

13C-1,2,3,4,7,8,9-HpCDF	94	26 - 138
13C-1,2,3,4,6,7,8-HpCDD	99	23 - 140
13C-OCDD	109	17 - 157

SURROGATE STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
37Cl4-2,3,7,8-TCDD	87	35 - 197

* TEF - WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

APPENDIX P
Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi
Client Sample ID: SS-3
Dioxin

Lot-Sample #:	G8B120224-3	**Work Order #:**	KG0X91AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	33
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

PARAMETER	RESULT	DETECTION LIMIT	*TEF FACTOR	TEQ CONCENTRATION
Dioxins/Furans, HRGC/HRMS (1613B)				
2,3,7,8-TCDF	0.85 J CON	0	0.1	0.09
Total TCDF	13	0		
2,3,7,8-TCDD	1.5	0	1	1.5
Total TCDD	6.6	0		
1,2,3,7,8-PeCDF	ND	0.82	0.03	0.01
2,3,4,7,8-PeCDF	ND	0.94	0.3	0.14
Total PeCDF	4.8	0		
1,2,3,7,8-PeCDD	ND	1.3	1	0.65
Total PeCDD	ND	2.9		
1,2,3,4,7,8-HxCDF	ND	1.6	0.1	0.08
1,2,3,6,7,8-HxCDF	ND	0.94	0.1	0.05
2,3,4,6,7,8-HxCDF	ND	1.6	0.1	0.08
1,2,3,7,8,9-HxCDF	ND	0.34	0.1	0.02
Total HxCDF	11	0		
1,2,3,4,7,8-HxCDD	ND	0.89	0.1	0.04
1,2,3,6,7,8-HxCDD	3.7 J	0	0.1	0.37
1,2,3,7,8,9-HxCDD	ND	2.9	0.1	0.15
Total HxCDD	20	0		
1,2,3,4,6,7,8-HpCDF	11	0	0.01	0.11
1,2,3,4,7,8,9-HpCDF	ND	0.61	0.01	0
Total HpCDF	25	0		
1,2,3,4,6,7,8-HpCDD	49	0	0.01	0.49
Total HpCDD	88	0		
OCDF	22	0	0.0003	0.01
OCDD	310	0	0.0003	0.09
Total TEQ Concentration				**3.88**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
13C-2,3,7,8-TCDF	89	24 - 169
13C-2,3,7,8-TCDD	92	25 - 164
13C-1,2,3,7,8-PeCDF	92	24 - 185
13C-2,3,4,7,8-PeCDF	97	21 - 178
13C-1,2,3,7,8-PeCDD	93	25 - 181
13C-1,2,3,4,7,8-HxCDF	102	26 - 152
13C-1,2,3,6,7,8-HxCDF	101	26 - 123
13C-2,3,4,6,7,8-HxCDF	109	28 - 136
13C-1,2,3,7,8,9-HxCDF	102	29 - 147
13C-1,2,3,4,7,8-HxCDD	105	32 - 141
13C-1,2,3,6,7,8-HxCDD	101	28 - 130
13C-1,2,3,4,6,7,8-HpCDF	103	28 - 143

Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi

Client Sample ID: SS-3

Dioxin

Lot-Sample #:	G8B120224-3	**Work Order #:**	KG0X91AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	33
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

13C-1,2,3,4,7,8,9-HpCDF	101	26 - 138
13C-1,2,3,4,6,7,8-HpCDD	108	23 - 140
13C-OCDD	115	17 - 157

SURROGATE STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
37Cl4-2,3,7,8-TCDD	93	35 - 197

* TEF - WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi

Client Sample ID: SS-4

Dioxin

Lot-Sample #:	G8B120224-4	**Work Order #:**	KG00D1AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	48
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

PARAMETER	RESULT	DETECTION LIMIT	*TEF FACTOR	TEQ CONCENTRATION
Dioxins/Furans, HRGC/HRMS (1613B)				
2,3,7,8-TCDF	ND CON	0.45	0.1	0.02
Total TCDF	1.1	0		
2,3,7,8-TCDD	ND	0.43	1	0.22
Total TCDD	ND	0.45		
1,2,3,7,8-PeCDF	ND	0.45	0.03	0.01
2,3,4,7,8-PeCDF	ND	0.54	0.3	0.08
Total PeCDF	ND	1.6		
1,2,3,7,8-PeCDD	ND	0.7	1	0.35
Total PeCDD	ND	2.1		
1,2,3,4,7,8-HxCDF	ND	0.7	0.1	0.04
1,2,3,6,7,8-HxCDF	ND	0.52	0.1	0.03
2,3,4,6,7,8-HxCDF	ND	0.81	0.1	0.04
1,2,3,7,8,9-HxCDF	ND	0.54	0.1	0.03
Total HxCDF	10	0		
1,2,3,4,7,8-HxCDD	ND	0.79	0.1	0.04
1,2,3,6,7,8-HxCDD	ND	1.6	0.1	0.08
1,2,3,7,8,9-HxCDD	ND	1.2	0.1	0.06
Total HxCDD	5.3	0		
1,2,3,4,6,7,8-HpCDF	11	0	0.01	0.11
1,2,3,4,7,8,9-HpCDF	ND	1.2	0.01	0.01
Total HpCDF	27	0		
1,2,3,4,6,7,8-HpCDD	21	0	0.01	0.21
Total HpCDD	37	0		
OCDF	12 J	0	0.0003	0
OCDD	120	0	0.0003	0.04
Total TEQ Concentration				**1.37**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
13C-2,3,7,8-TCDF	84	24 - 169
13C-2,3,7,8-TCDD	89	25 - 164
13C-1,2,3,7,8-PeCDF	88	24 - 185
13C-2,3,4,7,8-PeCDF	92	21 - 178
13C-1,2,3,7,8-PeCDD	87	25 - 181
13C-1,2,3,4,7,8-HxCDF	105	26 - 152
13C-1,2,3,6,7,8-HxCDF	105	26 - 123
13C-2,3,4,6,7,8-HxCDF	108	28 - 136
13C-1,2,3,7,8,9-HxCDF	104	29 - 147
13C-1,2,3,4,7,8-HxCDD	99	32 - 141
13C-1,2,3,6,7,8-HxCDD	104	28 - 130
13C-1,2,3,4,6,7,8-HpCDF	103	28 - 143

Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi

Client Sample ID: SS-4

Dioxin

Lot-Sample #:	G8B120224-4	**Work Order #:**	KG00D1AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	48
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

13C-1,2,3,4,7,8,9-HpCDF	109	26 - 138
13C-1,2,3,4,6,7,8-HpCDD	112	23 - 140
13C-OCDD	118	17 - 157

SURROGATE STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
37Cl4-2,3,7,8-TCDD	91	35 - 197

* TEF - WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi

Client Sample ID: SS-5

Dioxin

Lot-Sample #:	G8B120224-5	**Work Order #:**	KG00E1AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	22
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

PARAMETER	RESULT	DETECTION LIMIT	*TEF FACTOR	TEQ CONCENTRATION
Dioxins/Furans, HRGC/HRMS (1613B)				
2,3,7,8-TCDF	ND CON	0.46	0.1	0.02
Total TCDF	3.9	0		
2,3,7,8-TCDD	ND	0.28	1	0.14
Total TCDD	5.9	0		
1,2,3,7,8-PeCDF	ND	0.3	0.03	0
2,3,4,7,8-PeCDF	ND	0.33	0.3	0.05
Total PeCDF	ND	1.4		
1,2,3,7,8-PeCDD	ND	0.53	1	0.27
Total PeCDD	ND	1.6		
1,2,3,4,7,8-HxCDF	ND	0.72	0.1	0.04
1,2,3,6,7,8-HxCDF	ND	0.32	0.1	0.02
2,3,4,6,7,8-HxCDF	ND	0.46	0.1	0.02
1,2,3,7,8,9-HxCDF	ND	0.32	0.1	0.02
Total HxCDF	ND	1.6		
1,2,3,4,7,8-HxCDD	ND	0.44	0.1	0.02
1,2,3,6,7,8-HxCDD	ND	0.5	0.1	0.03
1,2,3,7,8,9-HxCDD	ND	0.5	0.1	0.03
Total HxCDD	ND	1.5		
1,2,3,4,6,7,8-HpCDF	ND	3	0.01	0.02
1,2,3,4,7,8,9-HpCDF	ND	0.85	0.01	0
Total HpCDF	ND	3		
1,2,3,4,6,7,8-HpCDD	4.5 J	0	0.01	0.05
Total HpCDD	4.5	0		
OCDF	ND	3.1	0.0003	0
OCDD	22	0	0.0003	0.01
Total TEQ Concentration				**0.74**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
13C-2,3,7,8-TCDF	88	24 - 169
13C-2,3,7,8-TCDD	90	25 - 164
13C-1,2,3,7,8-PeCDF	89	24 - 185
13C-2,3,4,7,8-PeCDF	94	21 - 178
13C-1,2,3,7,8-PeCDD	89	25 - 181
13C-1,2,3,4,7,8-HxCDF	98	26 - 152
13C-1,2,3,6,7,8-HxCDF	98	26 - 123
13C-2,3,4,6,7,8-HxCDF	102	28 - 136
13C-1,2,3,7,8,9-HxCDF	101	29 - 147
13C-1,2,3,4,7,8-HxCDD	100	32 - 141
13C-1,2,3,6,7,8-HxCDD	90	28 - 130
13C-1,2,3,4,6,7,8-HpCDF	101	28 - 143

APPENDIX P
Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi
Client Sample ID: SS-5
Dioxin

Lot-Sample #:	G8B120224-5	**Work Order #:**	KG00E1AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	22
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

13C-1,2,3,4,7,8,9-HpCDF	103	26 - 138
13C-1,2,3,4,6,7,8-HpCDD	109	23 - 140
13C-OCDD	111	17 - 157

SURROGATE STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
37Cl4-2,3,7,8-TCDD	92	35 - 197

* TEF - WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi

Client Sample ID: SS-6

Dioxin

Lot-Sample #:	G8B120224-6	**Work Order #:**	KG00F1AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	32
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

PARAMETER	RESULT	DETECTION LIMIT	*TEF FACTOR	TEQ CONCENTRATION
Dioxins/Furans, HRGC/HRMS (1613B)				
2,3,7,8-TCDF	ND CON	0.69	0.1	0.03
Total TCDF	6.8	0		
2,3,7,8-TCDD	ND	0.61	1	0.31
Total TCDD	5.9	0		
1,2,3,7,8-PeCDF	ND	0.35	0.03	0.01
2,3,4,7,8-PeCDF	ND	0.47	0.3	0.07
Total PeCDF	ND	2		
1,2,3,7,8-PeCDD	ND	1.4	1	0.7
Total PeCDD	ND	2.9		
1,2,3,4,7,8-HxCDF	ND	0.59	0.1	0.03
1,2,3,6,7,8-HxCDF	ND	0.44	0.1	0.02
2,3,4,6,7,8-HxCDF	ND	0.38	0.1	0.02
1,2,3,7,8,9-HxCDF	ND	0.25	0.1	0.01
Total HxCDF	ND	2.3		
1,2,3,4,7,8-HxCDD	ND	2.1	0.1	0.11
1,2,3,6,7,8-HxCDD	ND	2.4	0.1	0.12
1,2,3,7,8,9-HxCDD	ND	1.7	0.1	0.09
Total HxCDD	7.3	0		
1,2,3,4,6,7,8-HpCDF	4.7 J	0	0.01	0.05
1,2,3,4,7,8,9-HpCDF	ND	0.5	0.01	0
Total HpCDF	12	0		
1,2,3,4,6,7,8-HpCDD	28	0	0.01	0.28
Total HpCDD	52	0		
OCDF	11 J	0	0.0003	0
OCDD	150	0	0.0003	0.05
Total TEQ Concentration				**1.9**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
13C-2,3,7,8-TCDF	86	24 - 169
13C-2,3,7,8-TCDD	90	25 - 164
13C-1,2,3,7,8-PeCDF	86	24 - 185
13C-2,3,4,7,8-PeCDF	93	21 - 178
13C-1,2,3,7,8-PeCDD	84	25 - 181
13C-1,2,3,4,7,8-HxCDF	100	26 - 152
13C-1,2,3,6,7,8-HxCDF	99	26 - 123
13C-2,3,4,6,7,8-HxCDF	107	28 - 136
13C-1,2,3,7,8,9-HxCDF	101	29 - 147
13C-1,2,3,4,7,8-HxCDD	105	32 - 141
13C-1,2,3,6,7,8-HxCDD	97	28 - 130
13C-1,2,3,4,6,7,8-HpCDF	102	28 - 143

Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi

Client Sample ID: SS-6

Dioxin

Lot-Sample #:	G8B120224-6	**Work Order #:**	KG00F1AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	32
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

13C-1,2,3,4,7,8,9-HpCDF	99	26 - 138
13C-1,2,3,4,6,7,8-HpCDD	100	23 - 140
13C-OCDD	100	17 - 157

SURROGATE STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
37Cl4-2,3,7,8-TCDD	92	35 - 197

* TEF - WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

APPENDIX P
Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi
Client Sample ID: SS-1

Dioxin

Lot-Sample #:	G8B120224-1	**Work Order #:**	KG0X61AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	34
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

PARAMETER	RESULT	DETECTION LIMIT	*TEF FACTOR	TEQ CONCENTRATION
Dioxins/Furans, HRGC/HRMS (1613B)				
2,3,7,8-TCDF	0.93 J CON	0	0.1	0.09
Total TCDF	10	0		
2,3,7,8-TCDD	1.2 J JA	0	1	1.2
Total TCDD	10	0		
1,2,3,7,8-PeCDF	ND	0.44	0.03	0
2,3,4,7,8-PeCDF	ND	0.52	0.3	0
Total PeCDF	ND	2.4		
1,2,3,7,8-PeCDD	ND	0.75	1	0
Total PeCDD	4.8	0		
1,2,3,4,7,8-HxCDF	ND	0.72	0.1	0
1,2,3,6,7,8-HxCDF	ND	0.64	0.1	0
2,3,4,6,7,8-HxCDF	ND	0.59	0.1	0
1,2,3,7,8,9-HxCDF	ND	0.64	0.1	0
Total HxCDF	ND	2.7		
1,2,3,4,7,8-HxCDD	ND	2.1	0.1	0
1,2,3,6,7,8-HxCDD	ND	2.3	0.1	0
1,2,3,7,8,9-HxCDD	ND	2.3	0.1	0
Total HxCDD	22	0		
1,2,3,4,6,7,8-HpCDF	4.4 J JA	0	0.01	0.04
1,2,3,4,7,8,9-HpCDF	ND	0.88	0.01	0
Total HpCDF	13	0		
1,2,3,4,6,7,8-HpCDD	28	0	0.01	0.28
Total HpCDD	55	0		
OCDF	9.5 J	0	0.0003	0
OCDD	150	0	0.0003	0.05
Total TEQ Concentration				**1.66**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
13C-2,3,7,8-TCDF	89	24 - 169
13C-2,3,7,8-TCDD	89	25 - 164
13C-1,2,3,7,8-PeCDF	93	24 - 185
13C-2,3,4,7,8-PeCDF	97	21 - 178
13C-1,2,3,7,8-PeCDD	93	25 - 181
13C-1,2,3,4,7,8-HxCDF	101	26 - 152
13C-1,2,3,6,7,8-HxCDF	97	26 - 123
13C-2,3,4,6,7,8-HxCDF	102	28 - 136
13C-1,2,3,7,8,9-HxCDF	97	29 - 147
13C-1,2,3,4,7,8-HxCDD	102	32 - 141
13C-1,2,3,6,7,8-HxCDD	94	28 - 130
13C-1,2,3,4,6,7,8-HpCDF	87	28 - 143

Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi

Client Sample ID: SS-1

Dioxin

Lot-Sample #:	G8B120224-1	**Work Order #:**	KG0X61AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	34
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

13C-1,2,3,4,7,8,9-HpCDF	95	26 - 138
13C-1,2,3,4,6,7,8-HpCDD	99	23 - 140
13C-OCDD	107	17 - 157

SURROGATE STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
37Cl4-2,3,7,8-TCDD	90	35 - 197

* TEF - WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

APPENDIX P
Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi
Client Sample ID: SS-2
Dioxin

Lot-Sample #:	G8B120224-2	**Work Order #:**	KG0X71AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	44
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

PARAMETER	RESULT	DETECTION LIMIT	*TEF FACTOR	TEQ CONCENTRATION
Dioxins/Furans, HRGC/HRMS (1613B)				
2,3,7,8-TCDF	2.9 CON	0	0.1	0.29
Total TCDF	43	0		
2,3,7,8-TCDD	1.9	0	1	1.9
Total TCDD	32	0		
1,2,3,7,8-PeCDF	ND	1.6	0.03	0
2,3,4,7,8-PeCDF	ND	2.1	0.3	0
Total PeCDF	6.7	0		
1,2,3,7,8-PeCDD	11	0	1	11
Total PeCDD	89	0		
1,2,3,4,7,8-HxCDF	ND	3.6	0.1	0
1,2,3,6,7,8-HxCDF	ND	1.4	0.1	0
2,3,4,6,7,8-HxCDF	ND	2.5	0.1	0
1,2,3,7,8,9-HxCDF	ND	0.56	0.1	0
Total HxCDF	13	0		
1,2,3,4,7,8-HxCDD	8.1 J	0	0.1	0.81
1,2,3,6,7,8-HxCDD	75	0	0.1	7.5
1,2,3,7,8,9-HxCDD	39	0	0.1	3.9
Total HxCDD	460	0		
1,2,3,4,6,7,8-HpCDF	16	0	0.01	0.16
1,2,3,4,7,8,9-HpCDF	ND	1.1	0.01	0
Total HpCDF	36	0		
1,2,3,4,6,7,8-HpCDD	460	0	0.01	4.6
Total HpCDD	780	0		
OCDF	18	0	0.0003	0.01
OCDD	1000	0	0.0003	0.3
Total TEQ Concentration				**30.47**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
13C-2,3,7,8-TCDF	84	24 - 169
13C-2,3,7,8-TCDD	88	25 - 164
13C-1,2,3,7,8-PeCDF	86	24 - 185
13C-2,3,4,7,8-PeCDF	92	21 - 178
13C-1,2,3,7,8-PeCDD	87	25 - 181
13C-1,2,3,4,7,8-HxCDF	99	26 - 152
13C-1,2,3,6,7,8-HxCDF	98	26 - 123
13C-2,3,4,6,7,8-HxCDF	100	28 - 136
13C-1,2,3,7,8,9-HxCDF	97	29 - 147
13C-1,2,3,4,7,8-HxCDD	96	32 - 141
13C-1,2,3,6,7,8-HxCDD	101	28 - 130
13C-1,2,3,4,6,7,8-HpCDF	94	28 - 143

Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi

Client Sample ID: SS-2

Dioxin

Lot-Sample #:	G8B120224-2	**Work Order #:**	KG0X71AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	44
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

13C-1,2,3,4,7,8,9-HpCDF	94	26 - 138
13C-1,2,3,4,6,7,8-HpCDD	99	23 - 140
13C-OCDD	109	17 - 157

SURROGATE STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
37Cl4-2,3,7,8-TCDD	87	35 - 197

" TEF - WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

APPENDIX P
Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi
Client Sample ID: SS-3
Dioxin

Lot-Sample #:	G8B120224-3	**Work Order #:**	KG0X91AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	33
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

PARAMETER	RESULT	DETECTION LIMIT	*TEF FACTOR	TEQ CONCENTRATION
Dioxins/Furans, HRGC/HRMS (1613B)				
2,3,7,8-TCDF	0.85 J CON	0	0.1	0.09
Total TCDF	13	0		
2,3,7,8-TCDD	1.5	0	1	1.5
Total TCDD	6.6	0		
1,2,3,7,8-PeCDF	ND	0.82	0.03	0
2,3,4,7,8-PeCDF	ND	0.94	0.3	0
Total PeCDF	4.8	0		
1,2,3,7,8-PeCDD	ND	1.3	1	0
Total PeCDD	ND	2.9		
1,2,3,4,7,8-HxCDF	ND	1.6	0.1	0
1,2,3,6,7,8-HxCDF	ND	0.94	0.1	0
2,3,4,6,7,8-HxCDF	ND	1.6	0.1	0
1,2,3,7,8,9-HxCDF	ND	0.34	0.1	0
Total HxCDF	11	0		
1,2,3,4,7,8-HxCDD	ND	0.89	0.1	0
1,2,3,6,7,8-HxCDD	3.7 J	0	0.1	0.37
1,2,3,7,8,9-HxCDD	ND	2.9	0.1	0
Total HxCDD	20	0		
1,2,3,4,6,7,8-HpCDF	11	0	0.01	0.11
1,2,3,4,7,8,9-HpCDF	ND	0.61	0.01	0
Total HpCDF	25	0		
1,2,3,4,6,7,8-HpCDD	49	0	0.01	0.49
Total HpCDD	88	0		
OCDF	22	0	0.0003	0.01
OCDD	310	0	0.0003	0.09
Total TEQ Concentration				**2.66**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
13C-2,3,7,8-TCDF	89	24 - 169
13C-2,3,7,8-TCDD	92	25 - 164
13C-1,2,3,7,8-PeCDF	92	24 - 185
13C-2,3,4,7,8-PeCDF	97	21 - 178
13C-1,2,3,7,8-PeCDD	93	25 - 181
13C-1,2,3,4,7,8-HxCDF	102	26 - 152
13C-1,2,3,6,7,8-HxCDF	101	26 - 123
13C-2,3,4,6,7,8-HxCDF	109	28 - 136
13C-1,2,3,7,8,9-HxCDF	102	29 - 147
13C-1,2,3,4,7,8-HxCDD	105	32 - 141
13C-1,2,3,6,7,8-HxCDD	101	28 - 130
13C-1,2,3,4,6,7,8-HpCDF	103	28 - 143

APPENDIX P
Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi
Client Sample ID: SS-3
Dioxin

Lot-Sample #:	G8B120224-3	**Work Order #:**	KG0X91AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	33
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

13C-1,2,3,4,7,8,9-HpCDF	101	26 - 138
13C-1,2,3,4,6,7,8-HpCDD	108	23 - 140
13C-OCDD	115	17 - 157

SURROGATE STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
37Cl4-2,3,7,8-TCDD	93	35 - 197

* TEF - WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

APPENDIX P
Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi
Client Sample ID: SS-4
Dioxin

Lot-Sample #:	G8B120224-4	**Work Order #:**	KG00D1AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	48
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

PARAMETER	RESULT	DETECTION LIMIT	*TEF FACTOR	TEQ CONCENTRATION
Dioxins/Furans, HRGC/HRMS (1613B)				
2,3,7,8-TCDF	ND CON	0.45	0.1	0
Total TCDF	1.1	0		
2,3,7,8-TCDD	ND	0.43	1	0
Total TCDD	ND	0.45		
1,2,3,7,8-PeCDF	ND	0.45	0.03	0
2,3,4,7,8-PeCDF	ND	0.54	0.3	0
Total PeCDF	ND	1.6		
1,2,3,7,8-PeCDD	ND	0.7	1	0
Total PeCDD	ND	2.1		
1,2,3,4,7,8-HxCDF	ND	0.7	0.1	0
1,2,3,6,7,8-HxCDF	ND	0.52	0.1	0
2,3,4,6,7,8-HxCDF	ND	0.81	0.1	0
1,2,3,7,8,9-HxCDF	ND	0.54	0.1	0
Total HxCDF	10	0		
1,2,3,4,7,8-HxCDD	ND	0.79	0.1	0
1,2,3,6,7,8-HxCDD	ND	1.6	0.1	0
1,2,3,7,8,9-HxCDD	ND	1.2	0.1	0
Total HxCDD	5.3	0		
1,2,3,4,6,7,8-HpCDF	11	0	0.01	0.11
1,2,3,4,7,8,9-HpCDF	ND	1.2	0.01	0
Total HpCDF	27	0		
1,2,3,4,6,7,8-HpCDD	21	0	0.01	0.21
Total HpCDD	37	0		
OCDF	12 J	0	0.0003	0
OCDD	120	0	0.0003	0.04
Total TEQ Concentration				**0.36**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
13C-2,3,7,8-TCDF	84	24 - 169
13C-2,3,7,8-TCDD	89	25 - 164
13C-1,2,3,7,8-PeCDF	88	24 - 185
13C-2,3,4,7,8-PeCDF	92	21 - 178
13C-1,2,3,7,8-PeCDD	87	25 - 181
13C-1,2,3,4,7,8-HxCDF	105	26 - 152
13C-1,2,3,6,7,8-HxCDF	105	26 - 123
13C-2,3,4,6,7,8-HxCDF	108	28 - 136
13C-1,2,3,7,8,9-HxCDF	104	29 - 147
13C-1,2,3,4,7,8-HxCDD	99	32 - 141
13C-1,2,3,6,7,8-HxCDD	104	28 - 130
13C-1,2,3,4,6,7,8-HpCDF	103	28 - 143

APPENDIX P
Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi
Client Sample ID: SS-4

Dioxin

Lot-Sample #:	G8B120224-4	**Work Order #:**	KG00D1AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	48
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

13C-1,2,3,4,7,8,9-HpCDF	109	26 - 138
13C-1,2,3,4,6,7,8-HpCDD	112	23 - 140
13C-OCDD	118	17 - 157

SURROGATE STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
37Cl4-2,3,7,8-TCDD	91	35 - 197

* TEF - WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

APPENDIX P
Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi
Client Sample ID: SS-5
Dioxin

Lot-Sample #:	G8B120224-5	**Work Order #:**	KG00E1AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	22
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

PARAMETER	RESULT	DETECTION LIMIT	*TEF FACTOR	TEQ CONCENTRATION
Dioxins/Furans, HRGC/HRMS (1613B)				
2,3,7,8-TCDF	ND CON	0.46	0.1	0
Total TCDF	3.9	0		
2,3,7,8-TCDD	ND	0.28	1	0
Total TCDD	5.9	0		
1,2,3,7,8-PeCDF	ND	0.3	0.03	0
2,3,4,7,8-PeCDF	ND	0.33	0.3	0
Total PeCDF	ND	1.4		
1,2,3,7,8-PeCDD	ND	0.53	1	0
Total PeCDD	ND	1.6		
1,2,3,4,7,8-HxCDF	ND	0.72	0.1	0
1,2,3,6,7,8-HxCDF	ND	0.32	0.1	0
2,3,4,6,7,8-HxCDF	ND	0.46	0.1	0
1,2,3,7,8,9-HxCDF	ND	0.32	0.1	0
Total HxCDF	ND	1.6		
1,2,3,4,7,8-HxCDD	ND	0.44	0.1	0
1,2,3,6,7,8-HxCDD	ND	0.5	0.1	0
1,2,3,7,8,9-HxCDD	ND	0.5	0.1	0
Total HxCDD	ND	1.5		
1,2,3,4,6,7,8-HpCDF	ND	3	0.01	0
1,2,3,4,7,8,9-HpCDF	ND	0.85	0.01	0
Total HpCDF	ND	3		
1,2,3,4,6,7,8-HpCDD	4.5 J	0	0.01	0.05
Total HpCDD	4.5	0		
OCDF	ND	3.1	0.0003	0
OCDD	22	0	0.0003	0.01
Total TEQ Concentration				**0.06**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
13C-2,3,7,8-TCDF	88	24 - 169
13C-2,3,7,8-TCDD	90	25 - 164
13C-1,2,3,7,8-PeCDF	89	24 - 185
13C-2,3,4,7,8-PeCDF	94	21 - 178
13C-1,2,3,7,8-PeCDD	89	25 - 181
13C-1,2,3,4,7,8-HxCDF	98	26 - 152
13C-1,2,3,6,7,8-HxCDF	98	26 - 123
13C-2,3,4,6,7,8-HxCDF	102	28 - 136
13C-1,2,3,7,8,9-HxCDF	101	29 - 147
13C-1,2,3,4,7,8-HxCDD	100	32 - 141
13C-1,2,3,6,7,8-HxCDD	90	28 - 130
13C-1,2,3,4,6,7,8-HpCDF	101	28 - 143

APPENDIX P
Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi
Client Sample ID: SS-5
Dioxin

Lot-Sample #:	G8B120224-5	**Work Order #:**	KG00E1AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	22
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

13C-1,2,3,4,7,8,9-HpCDF	103	26 - 138
13C-1,2,3,4,6,7,8-HpCDD	109	23 - 140
13C-OCDD	111	17 - 157

SURROGATE STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
37Cl4-2,3,7,8-TCDD	92	35 - 197

* TEF - WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

APPENDIX P
Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi
Client Sample ID: SS-6

Dioxin

Lot-Sample #:	G8B120224-6	**Work Order #:**	KG00F1AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	32
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

PARAMETER	RESULT	DETECTION LIMIT	*TEF FACTOR	TEQ CONCENTRATION
Dioxins/Furans, HRGC/HRMS (1613B)				
2,3,7,8-TCDF	ND CON	0.69	0.1	0
Total TCDF	6.8	0		
2,3,7,8-TCDD	ND	0.61	1	0
Total TCDD	5.9	0		
1,2,3,7,8-PeCDF	ND	0.35	0.03	0
2,3,4,7,8-PeCDF	ND	0.47	0.3	0
Total PeCDF	ND	2		
1,2,3,7,8-PeCDD	ND	1.4	1	0
Total PeCDD	ND	2.9		
1,2,3,4,7,8-HxCDF	ND	0.59	0.1	0
1,2,3,6,7,8-HxCDF	ND	0.44	0.1	0
2,3,4,6,7,8-HxCDF	ND	0.38	0.1	0
1,2,3,7,8,9-HxCDF	ND	0.25	0.1	0
Total HxCDF	ND	2.3		
1,2,3,4,7,8-HxCDD	ND	2.1	0.1	0
1,2,3,6,7,8-HxCDD	ND	2.4	0.1	0
1,2,3,7,8,9-HxCDD	ND	1.7	0.1	0
Total HxCDD	7.3	0		
1,2,3,4,6,7,8-HpCDF	4.7 J	0	0.01	0.05
1,2,3,4,7,8,9-HpCDF	ND	0.5	0.01	0
Total HpCDF	12	0		
1,2,3,4,6,7,8-HpCDD	28	0	0.01	0.28
Total HpCDD	52	0		
OCDF	11 J	0	0.0003	0
OCDD	150	0	0.0003	0.05
Total TEQ Concentration				**0.38**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
13C-2,3,7,8-TCDF	86	24 - 169
13C-2,3,7,8-TCDD	90	25 - 164
13C-1,2,3,7,8-PeCDF	86	24 - 185
13C-2,3,4,7,8-PeCDF	93	21 - 178
13C-1,2,3,7,8-PeCDD	84	25 - 181
13C-1,2,3,4,7,8-HxCDF	100	26 - 152
13C-1,2,3,6,7,8-HxCDF	99	26 - 123
13C-2,3,4,6,7,8-HxCDF	107	28 - 136
13C-1,2,3,7,8,9-HxCDF	101	29 - 147
13C-1,2,3,4,7,8-HxCDD	105	32 - 141
13C-1,2,3,6,7,8-HxCDD	97	28 - 130
13C-1,2,3,4,6,7,8-HpCDF	102	28 - 143

Toxic Equivalent Quantitation (TEQ) Datasheet

Freshwater Environmental Servi

Client Sample ID: SS-6

Dioxin

Lot-Sample #:	G8B120224-6	**Work Order #:**	KG00F1AC	**Matrix:**	SOIL
Date Sampled:	2/8/2008	**Prep Batch #:**	8050366	**Units:**	pg/g
Date Received:	2/12/2008	**Date Prepped:**	2/19/2008	**%Moisture:**	32
		Date Analyzed:	2/22/2008	**Instrument:**	1D5
		Dilution Factor:	1		

13C-1,2,3,4,7,8,9-HpCDF	99	26 - 138
13C-1,2,3,4,6,7,8-HpCDD	100	23 - 140
13C-OCDD	100	17 - 157

SURROGATE STANDARDS	PERCENT RECOVERY	RECOVERY LIMIT
Dioxins/Furans, HRGC/HRMS (1613B)		
37Cl4-2,3,7,8-TCDD	92	35 - 197

* TEF - WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

QC DATA ASSOCIATION SUMMARY

G8B120224

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	SOLID	EPA-5 1613B		8050366	
002	SOLID	EPA-5 1613B		8050366	
003	SOLID	EPA-5 1613B		8050366	
004	SOLID	EPA-5 1613B		8050366	
005	SOLID	EPA-5 1613B		8050366	
006	SOLID	EPA-5 1613B		8050366	

METHOD BLANK REPORT

Trace Level Organic Compounds

Client Lot #...: G8B120224 **Work Order #...:** KHAVT1AA **Matrix.....:** SOLID
MB Lot-Sample #: G8B190000-366

Prep Date.....: 02/19/08
Analysis Date..: 02/22/08 **Prep Batch #...:** 8050366
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND	0.21	pg/g	EPA-5 1613B
Total TCDD	ND	0.21	pg/g	EPA-5 1613B
1,2,3,7,8-PeCDD	ND	0.31	pg/g	EPA-5 1613B
Total PeCDD	ND	1.5	pg/g	EPA-5 1613B
1,2,3,4,7,8-HxCDD	ND	0.30	pg/g	EPA-5 1613B
1,2,3,6,7,8-HxCDD	ND	0.31	pg/g	EPA-5 1613B
1,2,3,7,8,9-HxCDD	ND	0.26	pg/g	EPA-5 1613B
Total HxCDD	ND	0.31	pg/g	EPA-5 1613B
1,2,3,4,6,7,8-HpCDD	ND	0.45	pg/g	EPA-5 1613B
Total HpCDD	ND	0.45	pg/g	EPA-5 1613B
OCDD	ND	0.69	pg/g	EPA-5 1613B
2,3,7,8-TCDF	ND	0.11	pg/g	EPA-5 1613B
Total TCDF	ND	0.11	pg/g	EPA-5 1613B
1,2,3,7,8-PeCDF	ND	0.22	pg/g	EPA-5 1613B
2,3,4,7,8-PeCDF	ND	0.25	pg/g	EPA-5 1613B
Total PeCDF	ND	0.25	pg/g	EPA-5 1613B
1,2,3,4,7,8-HxCDF	ND	0.20	pg/g	EPA-5 1613B
1,2,3,6,7,8-HxCDF	ND	0.20	pg/g	EPA-5 1613B
2,3,4,6,7,8-HxCDF	ND	0.18	pg/g	EPA-5 1613B
1,2,3,7,8,9-HxCDF	ND	0.22	pg/g	EPA-5 1613B
Total HxCDF	ND	0.22	pg/g	EPA-5 1613B
1,2,3,4,6,7,8-HpCDF	ND	0.21	pg/g	EPA-5 1613B
1,2,3,4,7,8,9-HpCDF	ND	0.38	pg/g	EPA-5 1613B
Total HpCDF	ND	0.38	pg/g	EPA-5 1613B
OCDF	ND	0.79	pg/g	EPA-5 1613B

(Continued on next page)

METHOD BLANK REPORT

Trace Level Organic Compounds

Client Lot #...: G8B120224 **Work Order #...:** KHAVT1AA **Matrix.....:** SOLID

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS		
13C-2,3,7,8-TCDD	93	(25 - 164)		
13C-1,2,3,7,8-PeCDD	89	(25 - 181)		
13C-1,2,3,4,7,8-HxCDD	92	(32 - 141)		
13C-1,2,3,6,7,8-HxCDD	98	(28 - 130)		
13C-1,2,3,4,6,7,8-HpCDD	90	(23 - 140)		
13C-OCDD	82	(17 - 157)		
13C-2,3,7,8-TCDF	88	(24 - 169)		
13C-1,2,3,7,8-PeCDF	87	(24 - 185)		
13C-2,3,4,7,8-PeCDF	91	(21 - 178)		
13C-1,2,3,6,7,8-HxCDF	98	(26 - 123)		
13C-2,3,4,6,7,8-HxCDF	100	(28 - 136)		
13C-1,2,3,7,8,9-HxCDF	93	(29 - 147)		
13C-1,2,3,4,6,7,8-HpCDF	95	(28 - 143)		
13C-1,2,3,4,7,8,9-HpCDF	88	(26 - 138)		
13C-1,2,3,4,7,8-HxCDF	98	(26 - 152)		
SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS		
37Cl4-2,3,7,8-TCDD	91	(35 - 197)		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE DATA REPORT

Trace Level Organic Compounds

Client Lot #...: G8B120224 **Work Order #...:** KHAVT1AC **Matrix.....:** SOLID
LCS Lot-Sample#: G8B190000-366
Prep Date.....: 02/19/08 **Analysis Date..:** 02/22/08
Prep Batch #...: 8050366
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
2,3,7,8-TCDD	20.0	20.2	pg/g	101	EPA-5 1613B
1,2,3,7,8-PeCDD	100	101	pg/g	101	EPA-5 1613B
1,2,3,4,7,8-HxCDD	100	113	pg/g	113	EPA-5 1613B
1,2,3,6,7,8-HxCDD	100	99.4	pg/g	99	EPA-5 1613B
1,2,3,7,8,9-HxCDD	100	99.3	pg/g	99	EPA-5 1613B
1,2,3,4,6,7,8-HpCDD	100	106	pg/g	106	EPA-5 1613B
OCDD	200	207	pg/g	104	EPA-5 1613B
2,3,7,8-TCDF	20.0	20.4	pg/g	102	EPA-5 1613B
1,2,3,7,8-PeCDF	100	104	pg/g	104	EPA-5 1613B
2,3,4,7,8-PeCDF	100	104	pg/g	104	EPA-5 1613B
1,2,3,4,7,8-HxCDF	100	105	pg/g	105	EPA-5 1613B
1,2,3,6,7,8-HxCDF	100	105	pg/g	105	EPA-5 1613B
2,3,4,6,7,8-HxCDF	100	106	pg/g	106	EPA-5 1613B
1,2,3,7,8,9-HxCDF	100	107	pg/g	107	EPA-5 1613B
1,2,3,4,6,7,8-HpCDF	100	108	pg/g	108	EPA-5 1613B
1,2,3,4,7,8,9-HpCDF	100	108	pg/g	108	EPA-5 1613B
OCDF	200	219	pg/g	109	EPA-5 1613B

(Continued on next page)

LABORATORY CONTROL SAMPLE DATA REPORT

Trace Level Organic Compounds

Client Lot #...: G8B120224 **Work Order #...:** KHAVT1AC **Matrix.....:** SOLID
LCS Lot-Sample#: G8B190000-366

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	92	(25 - 164)
13C-1,2,3,7,8-PeCDD	89	(25 - 181)
13C-1,2,3,4,7,8-HxCDD	94	(32 - 141)
13C-1,2,3,6,7,8-HxCDD	108	(28 - 130)
13C-1,2,3,4,6,7,8-HpCDD	99	(23 - 140)
13C-OCDD	97	(17 - 157)
13C-2,3,7,8-TCDF	88	(24 - 169)
13C-1,2,3,7,8-PeCDF	88	(24 - 185)
13C-2,3,4,7,8-PeCDF	91	(21 - 178)
13C-1,2,3,6,7,8-HxCDF	102	(26 - 123)
13C-2,3,4,6,7,8-HxCDF	105	(28 - 136)
13C-1,2,3,7,8,9-HxCDF	99	(29 - 147)
13C-1,2,3,4,6,7,8-HpCDF	101	(28 - 143)
13C-1,2,3,4,7,8,9-HpCDF	94	(26 - 138)
13C-1,2,3,4,7,8-HxCDF	102	(26 - 152)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	94	(35 - 197)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

Trace Level Organic Compounds

Client Lot #...: G8B120224 Work Order #...: KHAVT1AC Matrix.....: SOLID
LCS Lot-Sample#: G8B190000-366
Prep Date.....: 02/19/08 Analysis Date..: 02/22/08
Prep Batch #...: 8050366
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
2,3,7,8-TCDD	101	(67 - 158)	EPA-5 1613B
1,2,3,7,8-PeCDD	101	(70 - 142)	EPA-5 1613B
1,2,3,4,7,8-HxCDD	113	(70 - 164)	EPA-5 1613B
1,2,3,6,7,8-HxCDD	99	(76 - 134)	EPA-5 1613B
1,2,3,7,8,9-HxCDD	99	(64 - 162)	EPA-5 1613B
1,2,3,4,6,7,8-HpCDD	106	(70 - 140)	EPA-5 1613B
OCDD	104	(78 - 144)	EPA-5 1613B
2,3,7,8-TCDF	102	(75 - 158)	EPA-5 1613B
1,2,3,7,8-PeCDF	104	(80 - 134)	EPA-5 1613B
2,3,4,7,8-PeCDF	104	(68 - 160)	EPA-5 1613B
1,2,3,4,7,8-HxCDF	105	(72 - 134)	EPA-5 1613B
1,2,3,6,7,8-HxCDF	105	(84 - 130)	EPA-5 1613B
2,3,4,6,7,8-HxCDF	106	(70 - 156)	EPA-5 1613B
1,2,3,7,8,9-HxCDF	107	(78 - 130)	EPA-5 1613B
1,2,3,4,6,7,8-HpCDF	108	(82 - 122)	EPA-5 1613B
1,2,3,4,7,8,9-HpCDF	108	(78 - 138)	EPA-5 1613B
OCDF	109	(63 - 170)	EPA-5 1613B

(Continued on next page)

APPENDIX P

LABORATORY CONTROL SAMPLE EVALUATION REPORT

Trace Level Organic Compounds

Client Lot #...: G8B120224 **Work Order #...:** KHAVT1AC **Matrix.....:** SOLID
LCS Lot-Sample#: G8B190000-366

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	92	(25 - 164)
13C-1,2,3,7,8-PeCDD	89	(25 - 181)
13C-1,2,3,4,7,8-HxCDD	94	(32 - 141)
13C-1,2,3,6,7,8-HxCDD	108	(28 - 130)
13C-1,2,3,4,6,7,8-HpCDD	99	(23 - 140)
13C-OCDD	97	(17 - 157)
13C-2,3,7,8-TCDF	88	(24 - 169)
13C-1,2,3,7,8-PeCDF	88	(24 - 185)
13C-2,3,4,7,8-PeCDF	91	(21 - 178)
13C-1,2,3,6,7,8-HxCDF	102	(26 - 123)
13C-2,3,4,6,7,8-HxCDF	105	(28 - 136)
13C-1,2,3,7,8,9-HxCDF	99	(29 - 147)
13C-1,2,3,4,6,7,8-HpCDF	101	(28 - 143)
13C-1,2,3,4,7,8,9-HpCDF	94	(26 - 138)
13C-1,2,3,4,7,8-HxCDF	102	(26 - 152)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	94	(35 - 197)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

SOLID, D 2216-90, Percent Moisture

Freshwater Environmental Services

Client Sample ID: SS-1

General Chemistry

Lot-Sample #...: G8B120224-001 **Work Order #...:** KG0X6 **Matrix.....:** SOLID
Date Sampled...: 02/08/08 **Date Received..:** 02/12/08
% Moisture.....: 34

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	**34.4**		**%**	**ASTM D 2216-90**	**02/18-02/19/08**	**8049332**

Dilution Factor: 1

APPENDIX P

Freshwater Environmental Services

Client Sample ID: SS-2

General Chemistry

Lot-Sample #...: G8B120224-002 **Work Order #...:** KG0X7 **Matrix.....:** SOLID
Date Sampled...: 02/08/08 **Date Received..:** 02/12/08
% Moisture.....: 44

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	**44.4**		**%**	**ASTM D 2216-90**	**02/18-02/19/08**	**8049332**

Dilution Factor: 1

Freshwater Environmental Services

Client Sample ID: SS-3

General Chemistry

Lot-Sample #...: G8B120224-003 Work Order #...: KG0X9 Matrix.....: SOLID
Date Sampled...: 02/08/08 Date Received..: 02/12/08
% Moisture.....: 33

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	32.7		%	ASTM D 2216-90	02/18-02/19/08	8049332

Dilution Factor: 1

Freshwater Environmental Services

Client Sample ID: SS-4

General Chemistry

Lot-Sample #...: G8B120224-004 Work Order #...: KG00D Matrix.....: SOLID
Date Sampled...: 02/08/08 Date Received..: 02/12/08
% Moisture.....: 48

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	48.3		%	ASTM D 2216-90	02/18-02/19/08	8049332

Dilution Factor: 1

APPENDIX P

Freshwater Environmental Services

Client Sample ID: SS-5

General Chemistry

Lot-Sample #...: G8B120224-005 **Work Order #...:** KG00E **Matrix.....:** SOLID
Date Sampled...: 02/08/08 **Date Received..:** 02/12/08
% Moisture.....: 22

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	**22.1**		**%**	**ASTM D 2216-90**	**02/18-02/19/08**	**8049333**

Dilution Factor: 1

APPENDIX P

Freshwater Environmental Services

Client Sample ID: SS-6

General Chemistry

Lot-Sample #...: G8B120224-006 **Work Order #...:** KG00F **Matrix.....:** SOLID
Date Sampled...: 02/08/08 **Date Received..:** 02/12/08
% Moisture.....: 32

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	32.3		%	ASTM D 2216-90	02/18-02/19/08	8049333

Dilution Factor: 1

QC DATA ASSOCIATION SUMMARY

G8B120224

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	SOLID	EPA-5 1613B		8050366	
	SOLID	ASTM D 2216-90		8049332	8049204
002	SOLID	EPA-5 1613B		8050366	
	SOLID	ASTM D 2216-90		8049332	8049204
003	SOLID	EPA-5 1613B		8050366	
	SOLID	ASTM D 2216-90		8049332	8049204
004	SOLID	EPA-5 1613B		8050366	
	SOLID	ASTM D 2216-90		8049332	8049204
005	SOLID	EPA-5 1613B		8050366	
	SOLID	ASTM D 2216-90		8049333	8049205
006	SOLID	EPA-5 1613B		8050366	
	SOLID	ASTM D 2216-90		8049333	8049205

APPENDIX P

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: G8B120224 **Work Order #...:** KGG61-SMP **Matrix.....:** SOLID
KGG61-DUP
Date Sampled...: 01/31/08 **Date Received..:** 02/02/08
% Moisture.....: 27

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture						SD Lot-Sample #: G8B020146-001		
	27.5	29.5	%	7.2	(0-20)	ASTM D 2216-90	02/18-02/19/08	8049332

Dilution Factor: 1

APPENDIX P

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: G8B120224 **Work Order #...:** KG00E-SMP **Matrix.....:** SOLID
KG00E-DUP
Date Sampled...: 02/08/08 **Date Received..:** 02/12/08
% Moisture.....: 22

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture						SD Lot-Sample #: G8B120224-005		
	22.1	25.1	%	13	(0-20)	ASTM D 2216-90	02/18-02/19/08	8049333

Dilution Factor: 1

APPENDIX P

NORTH COAST LABORATORIES LTD.

February 20, 2008

DANCO Builders
5251 Ericson Way
Arcata, CA 95521

Attn: Sean Armstrong

RE: Foster Avenue, Arcata, CA

Order No.: 0802146
Invoice No.: 72664
PO No.:
ELAP No. 1247-Expires July 2008

SAMPLE IDENTIFICATION

Fraction	Client Sample Description
01A	SB-1
01D	SB-1
01F	SB-1(DISSOLVED)
02A	SB-2
02D	SB-2
02F	SB-2(DISSOLVED)
03A	SB-3
03D	SB-3
03F	SB-3(DISSOLVED)

ND = Not Detected at the Reporting Limit

Limit = Reporting Limit

All solid results are expressed on a wet-weight basis unless otherwise noted.

REPORT CERTIFIED BY

Laboratory Supervisor(s)

QA Unit

Jesse G. Chaney, Jr.
Laboratory Director

APPENDIX P

North Coast Laboratories, Ltd. **Date:** 20-Feb-2008

CLIENT: DANCO Builders
Project: Foster Avenue, Arcata, CA
Lab Order: 0802146

CASE NARRATIVE

TPH as Diesel and/or Motor Oil passed through a Silica Gel Column:
All samples for this analysis were initially analyzed for diesel and/or motor oil. Samples that did not show material in the diesel and/or motor oil range were not passed through the silica gel column.

NORTH COAST LABORATORIES
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Printed on Recycled Paper

Date: 20-Feb-2008
WorkOrder: 0802146

ANALYTICAL REPORT

Client Sample ID: SB-1 **Received:** 02/07/08 **Collected:** 02/07/08 14:55
Lab ID: 0802146-01A

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L	1.0		02/12/08
Benzene	ND	0.50	µg/L	1.0		02/12/08
Toluene	ND	0.50	µg/L	1.0		02/12/08
Ethylbenzene	ND	0.50	µg/L	1.0		02/12/08
m,p-Xylene	ND	0.50	µg/L	1.0		02/12/08
o-Xylene	ND	0.50	µg/L	1.0		02/12/08
Surrogate: Toluene-d8	101	80-120	% Rec	1.0		02/12/08

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	ND	50	µg/L	1.0		02/12/08

Client Sample ID: SB-1 **Received:** 02/07/08 **Collected:** 02/07/08 14:55
Lab ID: 0802146-01D

Test Name: TPH passed through Silica Gel Column **Reference:** EPA 3510/3630/GCFID/8015B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Diesel (C12-C22)	ND	50	µg/L	1.0	02/11/08	02/14/08
TPHC Motor Oil	ND	170	µg/L	1.0	02/11/08	02/14/08

Client Sample ID: SB-1(DISSOLVED) **Received:** 02/07/08 **Collected:** 02/07/08 14:55
Lab ID: 0802146-01F

Test Name: ICP-MS Metals **Reference:** EPA 200.8 Rev 5.4 (1998)

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Cadmium	ND	5.0	µg/L	1.0	02/07/08	02/18/08
Chromium	24	5.0	µg/L	1.0	02/07/08	02/18/08
Lead	ND	5.0	µg/L	1.0	02/07/08	02/18/08
Nickel	26	5.0	µg/L	1.0	02/07/08	02/18/08
Zinc	26	10	µg/L	1.0	02/07/08	02/18/08

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Date: 20-Feb-2008
WorkOrder: 0802146

ANALYTICAL REPORT

Client Sample ID: SB-2 **Received:** 02/07/08 **Collected:** 02/07/08 15:15
Lab ID: 0802146-02A

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L	1.0		02/12/08
Benzene	ND	0.50	µg/L	1.0		02/12/08
Toluene	ND	0.50	µg/L	1.0		02/12/08
Ethylbenzene	ND	0.50	µg/L	1.0		02/12/08
m,p-Xylene	ND	0.50	µg/L	1.0		02/12/08
o-Xylene	ND	0.50	µg/L	1.0		02/12/08
Surrogate: Toluene-d8	101	80-120	% Rec	1.0		02/12/08

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	ND	50	µg/L	1.0		02/12/08

Client Sample ID: SB-2 **Received:** 02/07/08 **Collected:** 02/07/08 15:15
Lab ID: 0802146-02D

Test Name: TPH as Diesel/Motor Oil **Reference:** EPA 3510/EPA 8015B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Diesel (C12-C22)	ND	50	µg/L	1.0	02/11/08	02/13/08
TPHC Motor Oil	ND	170	µg/L	1.0	02/11/08	02/13/08

Client Sample ID: SB-2(DISSOLVED) **Received:** 02/07/08 **Collected:** 02/07/08 15:15
Lab ID: 0802146-02F

Test Name: ICP-MS Metals **Reference:** EPA 200.8 Rev 5.4 (1998)

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Cadmium	ND	5.0	µg/L	1.0	02/07/08	02/18/08
Chromium	9.7	5.0	µg/L	1.0	02/07/08	02/18/08
Lead	ND	5.0	µg/L	1.0	02/07/08	02/18/08
Nickel	19	5.0	µg/L	1.0	02/07/08	02/18/08
Zinc	ND	10	µg/L	1.0	02/07/08	02/18/08

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Date: 20-Feb-2008
WorkOrder: 0802146

ANALYTICAL REPORT

Client Sample ID: SB-3 **Received:** 02/07/08 **Collected:** 02/07/08 14:30
Lab ID: 0802146-03A

Test Name: Gasoline Components/Additives **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Methyl tert-butyl ether (MTBE)	ND	1.0	µg/L	1.0		02/12/08
Benzene	ND	0.50	µg/L	1.0		02/12/08
Toluene	ND	0.50	µg/L	1.0		02/12/08
Ethylbenzene	ND	0.50	µg/L	1.0		02/12/08
m,p-Xylene	ND	0.50	µg/L	1.0		02/12/08
o-Xylene	ND	0.50	µg/L	1.0		02/12/08
Surrogate: Toluene-d8	101	80-120	% Rec	1.0		02/12/08

Test Name: TPH as Gasoline **Reference:** LUFT/EPA 8260B Modified

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Gasoline	ND	50	µg/L	1.0		02/12/08

Client Sample ID: SB-3 **Received:** 02/07/08 **Collected:** 02/07/08 14:30
Lab ID: 0802146-03D

Test Name: TPH as Diesel/Motor Oil **Reference:** EPA 3510/EPA 8015B

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
TPHC Diesel (C12-C22)	ND	50	µg/L	1.0	02/11/08	02/13/08
TPHC Motor Oil	ND	170	µg/L	1.0	02/11/08	02/13/08

Client Sample ID: SB-3(DISSOLVED) **Received:** 02/07/08 **Collected:** 02/07/08 14:30
Lab ID: 0802146-03F

Test Name: ICP-MS Metals **Reference:** EPA 200.8 Rev 5.4 (1998)

Parameter	Result	Limit	Units	DF	Extracted	Analyzed
Cadmium	ND	5.0	µg/L	1.0	02/07/08	02/18/08
Chromium	10	5.0	µg/L	1.0	02/07/08	02/18/08
Lead	ND	5.0	µg/L	1.0	02/07/08	02/18/08
Nickel	18	5.0	µg/L	1.0	02/07/08	02/18/08
Zinc	ND	10	µg/L	1.0	02/07/08	02/18/08

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APPENDIX P

North Coast Laboratories, Ltd.

Date: 20-Feb-2008

CLIENT: DANCO Builders
Work Order: 0802146
Project: Foster Avenue, Arcata, CA

QC SUMMARY REPORT
Method Blank

Sample ID: **MB 021108** Batch ID: **R50939** Test Code: **8260OXYW** Units: **µg/L** Analysis Date **02/11/08 8:18:00 AM** Prep Date:
Client ID: Run ID: **ORGCMS3_080211A** SeqNo: **741791**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	ND	1.0									
Benzene	ND	0.50									
Toluene	ND	0.50									
Ethylbenzene	ND	0.50									
m,p-Xylene	ND	0.50									
o-Xylene	ND	0.50									
Toluene-d8	1.03	0.10	1.00	0	103%	80	120	0			

Sample ID: **MB 021108** Batch ID: **R50941** Test Code: **GASW-MS** Units: **µg/L** Analysis Date **02/11/08 8:18:00 AM** Prep Date:
Client ID: Run ID: **ORGCMS3_080211B** SeqNo: **741852**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gasoline	ND	50									

Sample ID: **MB-19696** Batch ID: **19696** Test Code: **ICPMSW** Units: **µg/L** Analysis Date **02/18/08 2:54:00 PM** Prep Date: **02/07/08**
Client ID: Run ID: **ICPMS_080218A** SeqNo: **743317**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	ND	5.0									
Chromium	0.6000	5.0									J
Lead	ND	5.0									
Nickel	0.2100	5.0									J
Zinc	ND	10									

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

APPENDIX P

CLIENT: DANCO Builders
Work Order: 0802146
Project: Foster Avenue, Arcata, CA

QC SUMMARY REPORT
Method Blank

Sample ID: **MB-19704** Batch ID: **19704** Test Code: **SGTPDMW** Units: **µg/L** Analysis Date **02/14/08 7:24:16 PM** Prep Date: **02/11/08**
Client ID: Run ID: **ORGC14_080214B** SeqNo: **742996**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel (C12-C22)	ND	50									
TPHC Motor Oil	ND	170									

Sample ID: **MB-19703** Batch ID: **19703** Test Code: **TPHDMW** Units: **µg/L** Analysis Date **02/13/08 3:06:23 AM** Prep Date: **02/11/08**
Client ID: Run ID: **ORGC14_080213B** SeqNo: **743055**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel (C12-C22)	ND	50									
TPHC Motor Oil	ND	170									

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

APPENDIX P

North Coast Laboratories, Ltd.

Date: 20-Feb-2008

CLIENT: DANCO Builders
Work Order: 0802146
Project: Foster Avenue, Arcata, CA

QC SUMMARY REPORT
Laboratory Control Spike

Sample ID: **LCS-08076** Batch ID: **R50939** Test Code: **8260OXYW** Units: **µg/L** Analysis Date **02/11/08 5:45:00 AM** Prep Date:
Client ID: Run ID: **ORGCMS3_080211A** SeqNo: **741789**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	18.56	1.0	20.0	0	92.8%	80	120	0			
Benzene	18.25	0.50	20.0	0	91.3%	80	120	0			
Toluene	19.49	0.50	20.0	0	97.5%	80	120	0			
Ethylbenzene	20.59	0.50	20.0	0	103%	80	120	0			
m,p-Xylene	40.83	0.50	40.0	0	102%	80	120	0			
o-Xylene	20.14	0.50	20.0	0	101%	80	120	0			
Toluene-d8	1.05	0.10	1.00	0	105%	80	120	0			

Sample ID: **LCSD-08076** Batch ID: **R50939** Test Code: **8260OXYW** Units: **µg/L** Analysis Date **02/12/08 3:09:00 AM** Prep Date:
Client ID: Run ID: **ORGCMS3_080211A** SeqNo: **741805**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methyl tert-butyl ether (MTBE)	18.40	1.0	20.0	0	92.0%	80	120	18.6	0.876%	20	
Benzene	18.43	0.50	20.0	0	92.1%	80	120	18.2	0.951%	20	
Toluene	19.38	0.50	20.0	0	96.9%	80	120	19.5	0.586%	20	
Ethylbenzene	20.42	0.50	20.0	0	102%	80	120	20.6	0.842%	20	
m,p-Xylene	40.14	0.50	40.0	0	100%	80	120	40.8	1.71%	20	
o-Xylene	19.33	0.50	20.0	0	96.7%	80	120	20.1	4.10%	20	
Toluene-d8	1.04	0.10	1.00	0	104%	80	120	1.05	0.0966%	20	

Sample ID: **LCS-08077** Batch ID: **R50941** Test Code: **GASW-MS** Units: **µg/L** Analysis Date **02/11/08 7:02:00 AM** Prep Date:
Client ID: Run ID: **ORGCMS3_080211B** SeqNo: **741850**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gasoline	1,098	50	1,000	0	110%	80	120	0			

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

APPENDIX P

CLIENT: DANCO Builders
Work Order: 0802146
Project: Foster Avenue, Arcata, CA

QC SUMMARY REPORT
Laboratory Control Spike Duplicate

Sample ID: **LCSD-08077** Batch ID: **R50941** Test Code: **GASW-MS** Units: **µg/L** Analysis Date **02/12/08 3:34:00 AM** Prep Date:
Client ID: Run ID: **ORGCMS3_080211B** SeqNo: **741866**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Gasoline	1,087	50	1,000	0	109%	80	120	1,100	1.08%	20	

Sample ID: **LCS-19696** Batch ID: **19696** Test Code: **ICPMSW** Units: **µg/L** Analysis Date **02/18/08 2:58:00 PM** Prep Date: **02/07/08**
Client ID: Run ID: **ICPMS_080218A** SeqNo: **743318**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	518.9	5.0	500	0	104%	85	115	0			
Chromium	527.0	5.0	500	0.600	105%	85	115	0			
Lead	524.0	5.0	500	0	105%	85	115	0			
Nickel	521.8	5.0	500	0.210	104%	85	115	0			
Zinc	517.2	10	500	0	103%	85	115	0			

Sample ID: **LCS-19704** Batch ID: **19704** Test Code: **SGTPDMW** Units: **µg/L** Analysis Date **02/14/08 5:46:50 PM** Prep Date: **02/11/08**
Client ID: Run ID: **ORGC14_080214B** SeqNo: **742997**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel (C12-C22)	477.7	50	500	0	95.5%	49	121	0			
TPHC Motor Oil	1,078	170	1,000	0	108%	50	118	0			

Sample ID: **LCSD-19704** Batch ID: **19704** Test Code: **SGTPDMW** Units: **µg/L** Analysis Date **02/14/08 6:11:04 PM** Prep Date: **02/11/08**
Client ID: Run ID: **ORGC14_080214B** SeqNo: **742998**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel (C12-C22)	513.6	50	500	0	103%	49	121	478	7.25%	15	
TPHC Motor Oil	1,108	170	1,000	0	111%	50	118	1,080	2.76%	15	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

APPENDIX P

CLIENT: DANCO Builders
Work Order: 0802146
Project: Foster Avenue, Arcata, CA

QC SUMMARY REPORT
Laboratory Control Spike

Sample ID: **LCS-19703** Batch ID: **19703** Test Code: **TPHDMW** Units: **µg/L** Analysis Date **02/13/08 1:06:29 AM** Prep Date: **02/11/08**
Client ID: Run ID: **ORGC14_080213B** SeqNo: **743052**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel (C12-C22)	533.1	50	500	0	107%	59	131	0			
TPHC Motor Oil	1,145	170	1,000	0	114%	54	145	0			

Sample ID: **LCSD-19703** Batch ID: **19703** Test Code: **TPHDMW** Units: **µg/L** Analysis Date **02/13/08 1:30:27 AM** Prep Date: **02/11/08**
Client ID: Run ID: **ORGC14_080213B** SeqNo: **743053**

Analyte	Result	Limit	SPK value	SPK Ref Val	% Rec	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
TPHC Diesel (C12-C22)	533.2	50	500	0	107%	59	131	533	0.0214%	15	
TPHC Motor Oil	1,147	170	1,000	0	115%	54	145	1,140	0.227%	15	

Qualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
B - Analyte detected in the associated Method Blank

APPENDIX P

NORTH COAST LABORATORIES LTD.
5680 West End Road • Arcata • CA 95521-9202
707-822-4649 Fax 707-822-6831

Chain of Custody

LABORATORY NUMBER: 0802146

Attention: Sean Armstrong
Results & Invoice to: Danco Group
Address: 5251 Ericson Way
Arcata, CA 95521
Phone: 822-9000 ext 585
Copies of Report to: Stan Thiesen
Freshwater Env. Services 1372 Anderson
Sampler (Sign & Print): [signature] Orrin Plocher McKinleyville CA

TAT: ☒ STD (2-3 Wk) ☐ Other:
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH SAMPLES.

REPORTING REQUIREMENTS:
☐ State Forms
☒ Geotracker ☐ SWAMP ☐ Other EDD:
☒ Final Report PDF ☐ FAX By:

PROJECT INFORMATION
Project Number:
Project Name: Foster Avenue, Arcata, CA
Purchase Order Number:

LAB ID	SAMPLE ID	DATE	TIME	MATRIX*	TPH-gas, BTEX 3-40ml VOA	TPH-Diesel, MO si-gel 2-60ml/oa	TPH-Diesel MO 2-60ml/od	Dissolved Metals 1-250ml P
	SB-1	2/7/08	1455	GW	✓	✓		✓
	SB-2	2/7/08	1515	GW	✓	✓		✓
	SB-3	2/7/08	1430	GW	✓	✓	✓	✓

ANALYSIS / CONTAINER / PRESERVATIVE

CONTAINER CODES: 1—½ gal. pl; 2—250 ml pl; 3—500 ml pl; 4—1 L Nalgene; 5—250 ml BG; 6—500 ml BG; 7—1 L BG; 8—1 L cg; 9—40 ml VOA; 10—125 ml VOA; 11—4 oz glass jar; 12—8 oz glass jar; 13—brass tube; 14—other

PRESERVATIVE CODES: a—HNO_3; b—HCl; c—H_2SO_4; d—$Na_2S_2O_3$; e—NaOH; f—$C_2H_3O_2Cl$; g—other

SAMPLE CONDITION/SPECIAL INSTRUCTIONS
TPH - gas, BTEX by 8260
TPH - diesel, Motor Oil - 8015 DRO
Some TPH diesel w/ si-gel.
Some TPH diesel w/out si gel.
Dissolved metals - 6010 cadmium chromium, nickel, lead, zinc
*Report PRE + Post SGC on SB-3

RELINQUISHED BY (Sign & Print)	DATE/TIME	RECEIVED BY (Sign)	DATE/TIME
[signature] Orrin Plocher	2/7/08 15:40	Stan Thiesen [signature]	2/7/08 1540
Stan Thiesen [signature]	2/7/08 1600	[signature] Orrin Plocher	2/7/08 1600
[signature] Orrin Plocher	2/7/08 1615	[signature] 2/7/08	1615

SAMPLE DISPOSAL
☒ NCL Disposal of Non-Contaminated
☐ Return ☐ Pickup

CHAIN OF CUSTODY SEALS Y/N/NA
SHIPPED VIA: UPS Air-Ex Fed-Ex Bus Hand

***MATRIX:** DW=Drinking Water; Eff=Effluent; Inf=Influent; SW=Surface Water; GW=Ground Water; S=Soil; O=Other.

ALL CONTAMINATED NON-AQUEOUS SAMPLES WILL BE RETURNED TO CLIENT

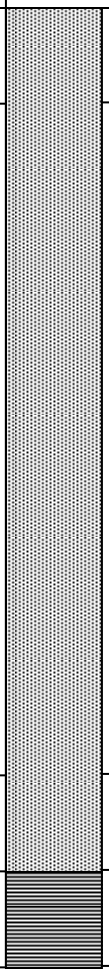
APPENDIX D

Boring Logs

Log of Boring - **SB-1**

Date Started: February 6, 2008	Date Completed: February 6, 2008

	Description	USCS	Remarks
1.0’	Silty sand, fine to medium, subrounded, very dark grayish brown (10YR 3/2), moist, some roots.	SM	
2.0’	Silty sand, fine to medium, subrounded, very dark gray (10YR 3/1), some rounded rocks up to 1.5", moist, probable fill material.	SM	
8.0’	Silty sand, fine to medium, subrounded, very dark gray (10YR 3/1), few rounded rocks up to 1.5", moist, some redwood bark.	SM	
9.0’	Clay with some silt, medium plasticity, 10 YR/3/1, (very dark gray), moist.	CL	
10.0’			



Well Completion: Boring re-augered and plugged with 3/8” bentonite pellets.

Log of Soil Boring
SB-1

Freshwater Environmental Services

Date: 2-24-08	Project No.: 113-07
By: SJT	Checked: OWP

Log of Boring - **SB-2**

Date Started: February 7, 2008	Date Completed: February 7, 2008

	Description	USCS	Remarks
	Silty sand, fine to medium, subrounded, very dark grayish brown (10YR 3/2), moist, some roots.	SM	Some redwood bark up to 1½" and rounded to well rounded gravel and cobbles ½" to 6".
1.0'	Silty sand, fine to medium, subrounded, very dark grayish brown (10YR 3/2), moist.	SM	
2.0'			
3.0'			Water level ~3'
4.0'	Clay with some silt, medium plasticity, 10 YR/3/1, (very dark gray), wet.	CL	
5.0'			

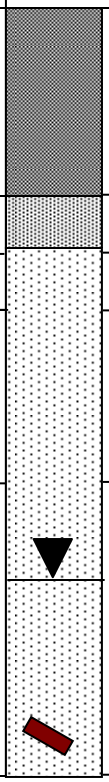
Well Completion: Boring re-augered and plugged with 3/8" bentonite pellets.

Log of Soil Boring
SB-2

Log of Boring - **SB-3**

Date Started: February 6, 2008	Date Completed: February 6, 2008

	Description	USCS	Remarks
1.0’	Silt, some fine to very fine sand, subrounded, very dark gray (10YR 3/1), moist.	ML	
2.0’	Silt, some fine to medium sand, subrounded, very dark grayish brown (7.5YR 3/2), moist.	ML	Some rounded gravel and cobbles ½” to 2”.
3.0’	Sand, fine to medium, some silt, subrounded, dark brown (10YR 3/3), moist.	SP	Some oxidized sand, dark yellowish brown (10YR 3/6).
4.0’	Sand, fine to medium, some silt, subrounded, dark brown (10YR 3/3).	SP	Some redwood bark.
5.0’	Sand, fine to medium, some silt, subrounded, very dark gray (10YR 3/1), wet.	SP	Some redwood bark. Water level ~5’
6.0’			
7.0’			Fire brick in bottom 1’.
8.0’			



Well Completion: Boring re-augered and plugged with 3/8” bentonite pellets.

Log of Soil Boring
SB-3

Freshwater Environmental Services

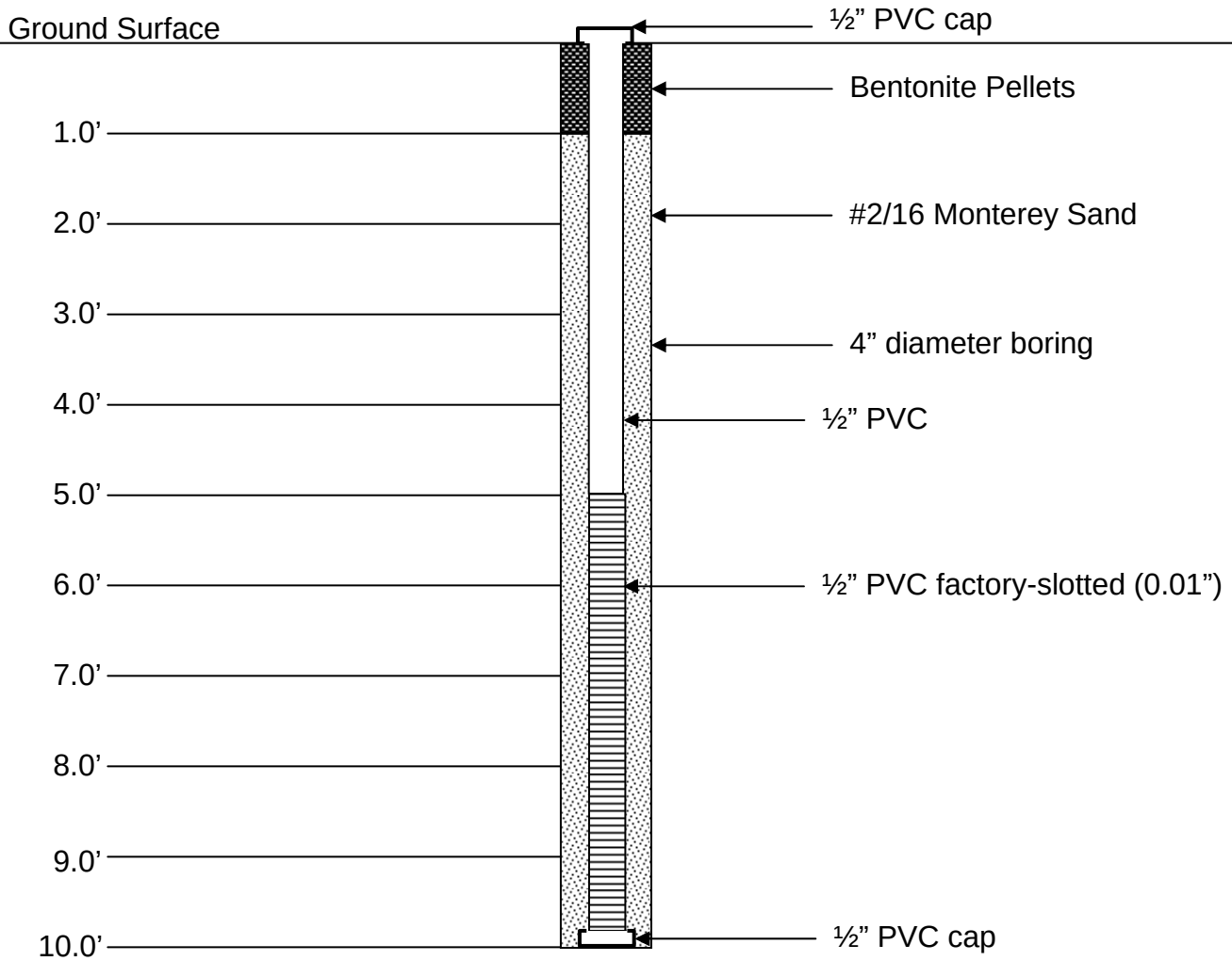
Date: 2-24-08	Project No.: 113-07
By: SJT	Checked: OWP

APPENDIX E

Temporary Well Construction Diagrams

Temporary Well/Soil Boring Details - **SB-1**

Date Installed: February 6, 2008	Date Destroyed: February 7, 2008



Well Completion: Boring re-augered and plugged with 3/8" bentonite pellets.

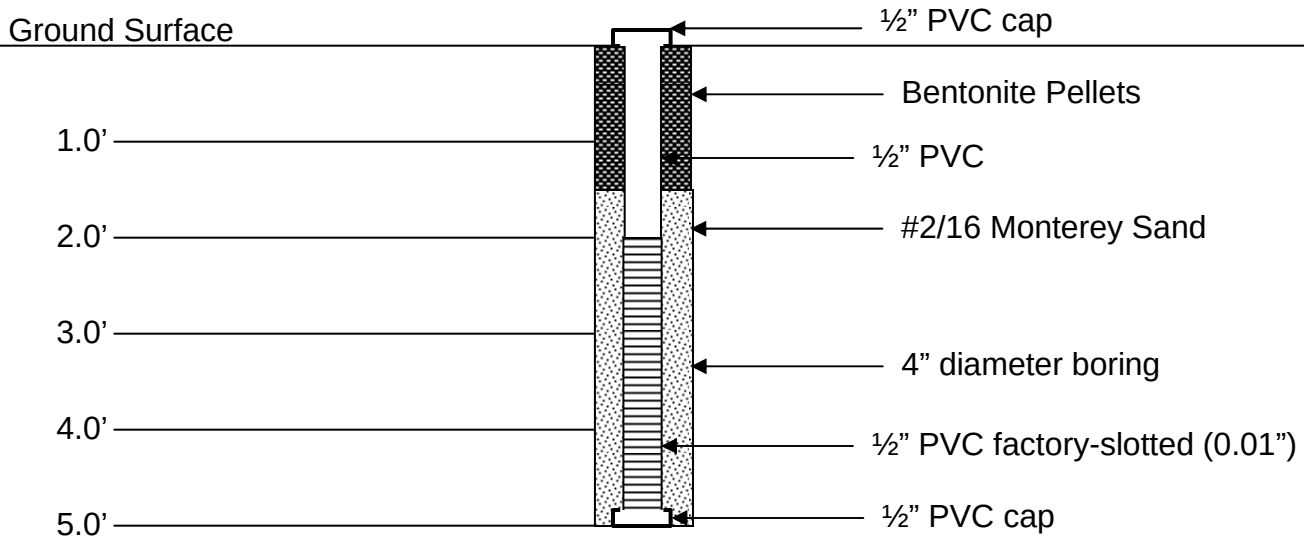
Temporary Well/Soil Boring Details
SB-1

Freshwater Environmental Services

Date: 2-24-08	Project No.: 113-07
By: SJT	Checked: OWP

Temporary Well/Soil Boring Details - **SB-2**

Date Installed: February 7, 2008	Date Destroyed: February 7, 2008



Well Completion: Boring re-augered and plugged with 3/8” bentonite pellets.

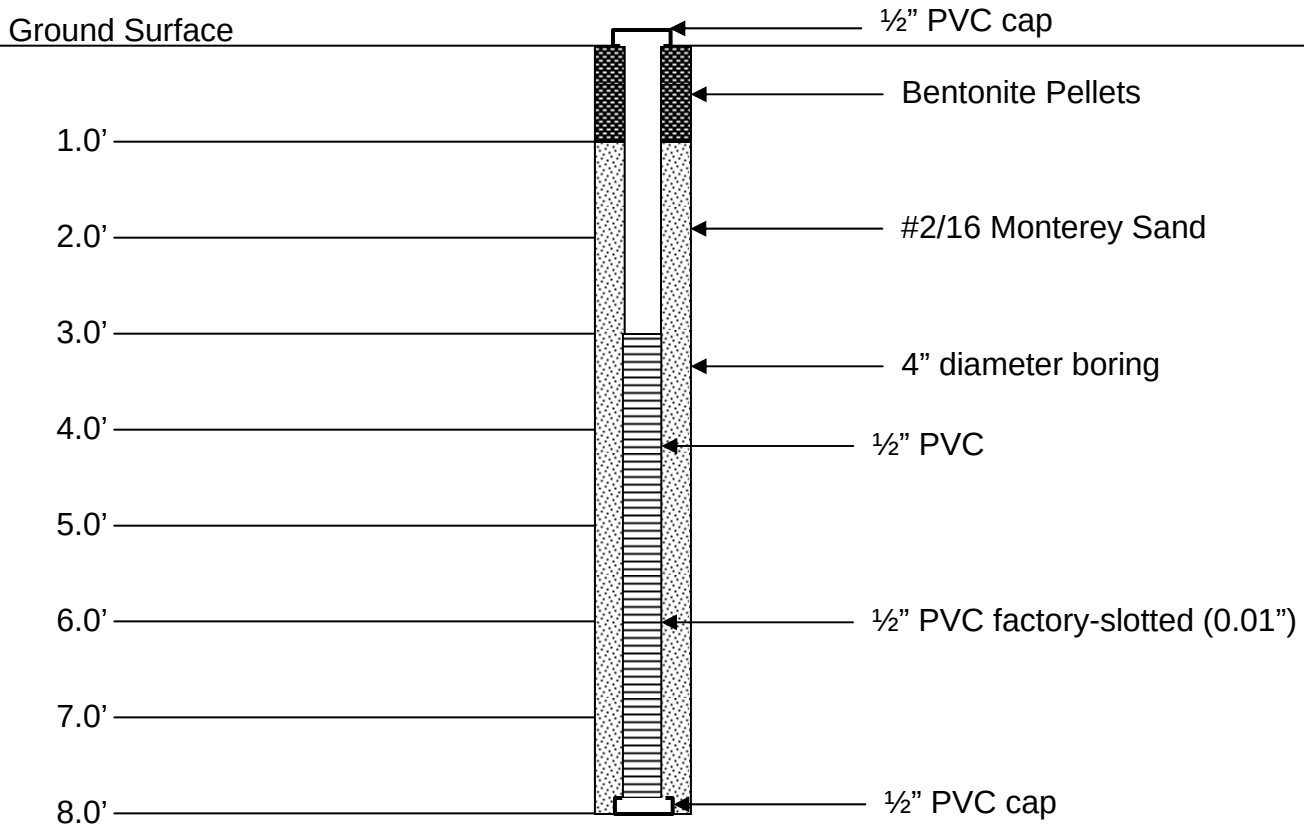
Temporary Well/Soil Boring Details
SB-2

Freshwater Environmental Services

Date: 2-24-08	Project No.: 113-07
By: SJT	Checked: OWP

Temporary Well/Soil Boring Details - **SB-3**

Date Installed: February 6, 2008	Date Destroyed: February 7, 2008



Well Completion: Boring re-augered and plugged with 3/8" bentonite pellets.

Temporary Well/Soil Boring Details
SB-3

Freshwater Environmental Services

Date: 2-24-08	Project No.: 113-07
By: SJT	Checked: OWP

APPENDIX F

Standard Operating Procedures

Freshwater Environmental Services

Standard Operating Procedure
Shallow Soil Sampling

1.0 SCOPE AND APPLICATION

The purpose of this standard operating procedure (SOP) is to describe the procedures for the collection of representative soil samples. Sampling depths are assumed to be those that can be reached without the use of a drill rig, direct-push, or other mechanized equipment (except for a back-hoe). Analysis of soil samples may determine whether concentrations of specific pollutants exceed established action levels, or if the concentrations of pollutants present a risk to public health, welfare, or the environment.

These are standard operating procedures which may be varied or changed as required, dependent upon site conditions, equipment limitations or limitations imposed by the procedure

2.0 METHOD SUMMARY

Soil samples may be collected using a variety of methods and equipment depending on the depth of the desired sample, the type of sample required (disturbed vs. undisturbed), and the soil type. Near-surface soils may be easily sampled using a spade, trowel, and scoop. Sampling at greater depths may be performed using a hand auger, continuous flight auger, or, if required, a backhoe.

3.0 SAMPLE PRESERVATION, CONTAINERS, HANDLING, AND STORAGE

Chemical preservation of solids is not generally recommended. Samples should, however, be cooled and protected from sunlight to minimize any potential reaction. The amount of sample to be collected and proper sample container type shall be provided by the analytical laboratory that will perform the required analysis.

4.0 INTERFERENCES AND POTENTIAL PROBLEMS

There are two primary potential problems associated with soil sampling - cross contamination of samples and improper sample collection. Cross contamination problems can be eliminated or minimized through the use of dedicated sampling equipment. If this is not possible or practical, then decontamination of sampling equipment is necessary. Improper sample collection can involve using contaminated equipment, disturbance of the matrix resulting in compaction of the sample, or inadequate homogenization of the samples where required, resulting in variable, non-representative results.

5.0 EQUIPMENT

Soil sampling equipment includes the following:

- Maps/plot plan
- Safety equipment, as specified in the site-specific Health and Safety Plan
- Survey equipment or global positioning system (GPS) to locate sampling points
- Tape measure
- Survey stakes or flags
- Camera and film
- Stainless steel, plastic, or other appropriate homogenization bucket, bowl or pan
- Appropriate size sample containers
- Ziplock plastic bags
- Logbook
- Labels
- Chain of Custody records and custody seals
- Field data sheets and sample labels
- Cooler(s)
- Ice
- Packing material
- Decontamination supplies/equipment
- Canvas or plastic sheet
- Spade or shovel
- Spatula
- Scoop
- Plastic or stainless steel spoons
- Trowel(s)
- Bucket auger
- Post hole auger
- Extension rods
- T-handle

6.0 PROCEDURES

6.1 Preparation

1. Determine the extent of the sampling effort, the sampling methods to be employed, and the types and amounts of equipment and supplies required.

2. Obtain necessary sampling and monitoring equipment.

3. Decontaminate or pre-clean equipment, and ensure that it is in working order.

4. Prepare schedules and coordinate with staff, client, and regulatory agencies, if appropriate.

5. Perform a general site survey prior to site entry in accordance with the site specific Health and Safety Plan.

6. Use stakes, flagging, or buoys to identify and mark all sampling locations. Specific site factors, including extent and nature of contaminant, should be considered when selecting sample location. If required, the proposed locations may be adjusted based on site access, property boundaries, and surface obstructions. All staked locations should be utility-cleared by Underground Service Alert (USA) and the property owner prior to soil sampling; and utility clearance should always be confirmed before beginning work.

6.2 Sample Collection

6.2.1 Surface Soil Samples

Collection of samples from near-surface soil can be accomplished with tools such as spades, shovels, trowels, and scoops. Surface material is removed to the required depth and a stainless steel or plastic scoop is then used to collect the sample. This method can be used in most soil types but is limited to sampling at or near the ground surface. Accurate, representative samples can be collected with this procedure depending on the care and precision demonstrated by the sample team.

The following procedure is used to collect surface soil samples:

1. Carefully remove the top layer of soil or debris to the desired sample depth with a pre-cleaned spade.

2. Using a pre-cleaned, stainless steel scoop, plastic spoon, or trowel, remove and discard a thin layer of soil from the area which came in contact with the spade.

3. If volatile organic analysis is to be performed, transfer the sample directly into an appropriate, labeled sample container with a stainless steel lab spoon, or equivalent and secure the cap tightly. Place the remainder of the sample into a stainless steel, plastic, or other appropriate homogenization container, and mix thoroughly to obtain a homogenous sample representative of the entire sampling interval. Then, either place the sample into appropriate, labeled containers and secure the caps tightly; or, if composite samples are to be collected, place a sample from another sampling interval or location into the homogenization container and mix thoroughly. When compositing is complete, place the sample into appropriate, labeled containers and secure the caps tightly.

7.0 QUALITY ASSURANCE/QUALITY CONTROL

There are no specific quality assurance (QA) activities which apply to the implementation of these procedures. However, the following QA procedures apply:

1. All data must be documented on field data sheets or within site logbooks.

2. All instrumentation must be operated in accordance with operating instructions as supplied by the manufacturer, unless otherwise specified in the work plan. Equipment checkout and calibration activities must occur prior to sampling/operation, and they must be documented.

8.0 HEALTH AND SAFETY

When working with potentially hazardous materials, follow U.S. EPA, OHSA and corporate health and safety procedures, in addition to the procedures specified in the site specific Health & Safety Plan.

Freshwater Environmental Services

Standard Operating Procedure
Hand Auger and Thin-Wall Sampler

1.0 PURPOSE

This standard operating procedure (SOP) describes the process for collecting surface and subsurface (up to about 15 ft.) soil samples with a hand auger and thin-wall tube sampler.

2.0 DEFINITIONS

*Bucket auge*r—A hand-held steel auger that can be used for digging or for sample collection. Most bucket augers consist of the auger bucket, shafts of various lengths, and a T-grip handle. All parts are either threaded and screwed together or held together with pins.

*Thin-wall tube sample*r—A one-piece metal tube, of thin gauge, which is forcefully driven into soil or sediment with a bucket auger's handle (or similar piece of equipment) at a particular sample location to collect an undisturbed surface soil or sediment sample. The sample is loaded into the stainless-steel tube by propelling the sampler into the soil, usually with a corkscrew action. The tube is the sample container and cannot be reused. The tube is generally used in conjunction with a bucket auger. They cannot be used in extremely hard soil.

3.0 PROCEDURE

Pre-Sampling Activities

- The **field team** shall acquire all necessary documentation and label all bottles.
- The **field team** shall ensure that all sampling equipment is properly decontaminated.
- In the field notebook, the **field team** shall note the exact location and location identification number of the sampled hole.
- If possible, the **field team** shall photograph the location.
- The **field team** shall mark the sampling location with stakes that include the location identification number.

Sampling Activities

Note: Discuss, understand, and fully document in the field notebook and/or daily logs the collection strategy and rationale described in the relevant sampling and analysis plan, as well as the requirements for sample handling and

decontamination between samples. Be prepared to manage borehole soil or rock in accordance with the site-specific sampling plan.

- The **field team** shall dig with a Bucket Auger in the following manner:
- Assemble the auger with a 2-, 3-, or 4-ft. shaft.
- Press down and turn the auger, digging down six to 12 inches.
- Lift the auger out of the hole and remove the soil from the auger bucket.

Note: Experience shows how deep to dig with each bucket load without making the auger stick.

- Adding additional shaft sections, repeat above steps until the required depth (usually about six inches above the intended collection depth) is reached.
- The **field team** shall collect a sample with a Bucket Auger in the following manner:
- With a clean bucket, dig out enough soil for the sample.

Note: Granular soils may not stay in the bucket. There are different styles of buckets designed for clayey versus sandy soil or sediment. These buckets vary in their degree of soil containment; choose accordingly.

- Discard any soil that falls down the hole and, as such, did not come from the required sample depth.
- Put an adequate amount of sample material into a decontaminated, stainless-steel or plastic bucket and mix until the sample is homogenized.

Note: When analyzing soils for SOVCs, do not use a plastic bucket for mixing or holding the sampled soil.

- Fill the sample containers.
- For VOC samples collected in soil (unconsolidated material), use an En Core Sampler and associated sample container to extract the VOC samples, following the current version of En Core technical manual/operating instructions.
- When collecting a composite sample, keep the pan of soil out of the sun and keep it covered with aluminum foil; collect all the aliquots as quickly as possible; do not decontaminate the auger between aliquots.

The **field team** shall collect a sample with a Thin-Wall Tube Sampler in the following manner:

- Dig to the required depth using the bucket auger.
- Assemble the tube holder with the appropriate tube inside and attach the tube holder to the auger shaft.

- Shove, twist, or pound the tube holder into the ground until it is full; when pounding, use a plastic hammer and take care not to damage the equipment.

Note: If the sample is taken from the surface, remove any rocks, sticks, or leaves before driving the sampler into the ground.

- Disassemble the tube holder, being careful not to let any soil fall out of the tube.
- Immediately cover the ends of the sample tube with 2-inch Teflon film, then put plastic caps over the film.

Note: If appropriate, place tape over the caps to ensure retention before submitting the entire tube to the laboratory.

- Label the bottom end of the tube with "*Open This End*."
- For VOC samples, either seal and ship the tube intact or use an En Core sampler and associated sample container to extract the VOC samples, following the current version of En Core technical manual/operating instructions, prior to capping the tube.
- Place the thin-wall tube sampler on a secure bench, table, rack, or on plastic laid on the ground.
- The **field team** shall label sample containers and complete documentation.
- A **field team member** shall enter the sample information in the field notebook and in the collection log at this time, including sample location identification number, depth interval, etc.
- Whenever a sample is collected for chemical analyses, a **field team member** shall initiate a custody record via the Chain of Custody/Request for Analysis Form and affix a sample label to the sample container.
- Whenever a soil sample is collected, a **field team member** shall enter a complete description of the soil in either a sample collection log or, if several intervals of soil are collected from one location, a daily drilling summary.

Post-Sampling Activities

- The **field team** shall decontaminate the outside of sample containers.
- The **field team** shall bag the samples in Ziploc bags.
- The **field team** shall pack samples in a cooler at the sampling site, ensuring that the cooler contains ice, as specified by the site specific sampling plan.
- The **field team** shall transport the cooler full of samples to the laboratory.
- The **field team** shall decontaminate equipment according to equipment decontamination SOP.

- The **field team** shall refill holes and restore the sampling area according to instructions provided in the site-specific, sampling plan.
- The **field team** shall check that all sampling locations are properly staked and that location identifications are readily visible on the location stakes.

Freshwater Environmental Services

Standard Operating Procedure
Equipment Decontamination

1.0 SCOPE AND APPLICABILITY

This standard operating procedure (SOP) describes the methods for decontamination of reusable field equipment. Decontamination helps prevents cross contamination. Equipment that is reused between sampling locations will be decontaminated before and between each sampling location. Wastes will be collected and disposed properly.

2.0 MATERIALS AND SUPPLIES

- Cleaning liquids including detergent solutions (Liquinox) tap water distilled water
- Personal protective safety gear
- Paper towels
- Disposable gloves
- Waste containers
- Cleaning containers (buckets)
- Cleaning brushes

3.0 PROCEDURE

- Removal of gross contamination from equipment with a dry brush and rinse in tap water
- Wash with laboratory-grade detergent
- Rinse with tap water
- Triple rinse with distilled water
- Air dry or wipe with chemical-free towels

Decontaminated equipment should be stored in sealable containers or zip-lock type bags.

APPENDIX Q

DIOXIN ASSESSMENT REPORT

FORMER EEL RIVER SAWMILL SPECIALTY MILL
2000 FOSTER AVENUE, ARCATA, CALIFORNIA
CASE NUMBER 1NHU518

Prepared for:

Foster Avenue, LLC.

5251 Ericson Way
Arcata, California 95521

August 7, 2008

Prepared by:
Orrin Plocher and Stan Thiesen

of

Freshwater Environmental Services

1372 Anderson Ave.
McKinleyville, California 95519
Phone (707) 839-0091

APPENDIX Q

PROFESSIONAL CERTIFICATION

This report has been prepared by Freshwater Environmental Services under the professional supervision of Stan Thiesen. The findings, recommendations, specifications and/or professional opinions presented in this report have been prepared in accordance with generally accepted professional hydrogeologic and environmental consulting practices, and within the scope of the project. There is no other warranty, either express or implied.

Stan Thiesen
P.G. No. 7990
Geologist
Freshwater Environmental Services

APPENDIX Q

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1.0 INTRODUCTION

Freshwater Environmental Services (FES) has prepared this Dioxin Assessment Report to document the collection and laboratory analysis of soils and one groundwater grab sample collected from the former Eel River Sawmill Specialty Mill located at 2000 Foster Avenue near Arcata, California (the Site). The Site location is shown on Figure 1. The Site plan with sample locations is shown on Figures 2 and 3.

This investigation was performed in accordance with the Workplan for Dioxin Assessment prepared by FES dated April 25, 2008 (FES, 2008), and approved in a letter from the California Regional Water Quality Control Board, North Coast Region (RWQCB) dated May 5, 2008.

This report is organized as follows: The Site background is described in Section 2.0. Sampling methods and analysis are included in Section 3.0. Data quality evaluation is presented in Section 4.0. Investigation derived wastes are discussed in Section 5.0, and conclusions and recommendations are presented in Section 6.0. The references cited in this report are listed in Section 7.0.

2.0 SITE BACKGROUND

Based on information provided in the RWQCB interoffice memo dated September 4, 2007 (Ashley, 2007), the Site was open space prior to 1950 and utilized as undeveloped land and pasture. In 1951, the Site was developed into an old-growth redwood mill that was operated until 1986, at which time the mill structures were demolished. The surface of the Site has been relatively undisturbed since the operation of the sawmill, as evidenced by the presence of all major foundations at or near current grade, and the presence of facility roads and log deck roads observed on historic aerial photographs.

2.1 Previous Investigations

Numerous previous investigations have been conducted at the Site including:

- 1993, Phase I Environmental Site Assessment by SHN Consulting Engineers & Geologists (SHN);
- 1994, Preliminary Phase II Field Investigation by SHN;
- 1994, 12 backhoe test pits located in the fuel tank area (FTA), septic tank area (STA), vehicle maintenance area (VM), debarker area (DB), and the old log deck area (DA);
- 1994, 30 backhoe test pits and four temporary piezometers placed in several areas including the FTA, VM, DB, DA, the leachfield, and at the property boundary;
- 1995, 4 monitoring wells and one temporary piezometer;
- 1996, 15-test pits, 8-soil gas points, 3 well points;
- 1997, soil excavation in three areas (VM, 520 cubic yards; DB, 420 cubic yards; and FTA, 1,060 cubic yards); and
- 1998, Site Development Contingency Investigation Plan.

Previous investigations indicated that Site soils and groundwater had been impacted with diesel, motor oil, and gasoline. Metals including chromium, nickel, lead, and zinc were found to be present in Site soils, and Site groundwater was reported to have contained dissolved chromium, nickel, zinc, and lead. Based on groundwater measurements during previous investigations, it was determined that groundwater was generally encountered at a depth of less than 10 feet below ground level (bgl) and that the groundwater gradient was generally to the east (SHN, 1995).

A letter from the RWQCB dated September 11, 2007, indicated that previous investigations performed by the former Site owner, Eel River Sawmills, were considered to be incomplete. The letter required the submittal of a workplan to evaluate if there had been discharges of dioxins into soils in the area of the former teepee burner, and to determine if discharges of petroleum or dissolved metals occurred to the groundwater within ten feet down-gradient from previously identified source areas. FES submitted a workplan for Additional Site Investigation dated October 29, 2007 (FES, 2007). Concurrence with the workplan was received from the RWQCB in a letter dated December, 10, 2007.

During an Additional Site Investigation conducted by FES (FES, 2008b), soil and groundwater samples were collected from remaining areas of interest including the

former teepee burner area, vehicle maintenance area (VM), and the debarker area (DB). In this investigation, petroleum compounds including gasoline, diesel and motor oil, were not detected in the groundwater grab samples collected from the areas of concern. Dissolved metals including chromium, nickel, and zinc were detected in the groundwater grab samples, likely due to leaching of background concentrations of metals from onsite soils. One soil sample (SS-2) was found to have a Dioxin/furan Toxicity Equivalent (TEQ) exceeding applicable residential regulatory standards.

Based on a review of the *Additional Site Investigation Report (*FES, 2008b), the California Regional Water Quality Control Board, North Coast Region (RWQCB) requested an additional investigation at the Site. In a March 25, 2008 letter to the Site owner, Ms. Kasey Ashley of the RWQCB requested an assessment of dioxins in soils and groundwater at the Site.

FES prepared and submitted a workplan for a Dioxin Assessment dated April 25, 2008, (FES, 2008). Concurrence with the workplan from the RWQCB was received in a letter dated May, 5, 2008. This report contains the results of the above investigation.

3.0 SAMPLING METHODS AND ANALYSIS

3.1 Soil Sampling

FES advanced five borings near previously collected soil sample SS-2 on May 20, 2008. Soil boring SB-4 is located at the former surface soil sampling location SS-2. Four soil samples were collected from the soil boring SB-4: from 0.5-1.0 feet, 1.0-1.5 feet, 1.5-2.0 feet, and 2.5-3.0 feet intervals bgl. All four samples were submitted to the laboratory. The shallowest soil sample from 0.5-1.0 feet bgl was analyzed for dioxin compounds. Samples from the deeper intervals were held pending the results of the shallower sample.

Two soil samples from each of the four additional borings (SB-5, SB-6, SB-7 and SB-8) were collected from 0.0-0.5 feet and 0.5-1.0 feet bgl. All of the soil samples were submitted to the laboratory, and the shallowest soil samples from SB-7 and SB-8 were analyzed for dioxin compounds. Samples from the deeper intervals and the other two borings were held pending the results of the shallower samples from SB-7 and SB-8. The boring locations are shown on Figures 2 and 3.

3.11 Field Methods and Observations

Prior to all subsurface field activities, FES contacted Underground Service Alert (USA) to identify all known public utilities in the area of the Site. In addition, FES worked with the Site owner to identify any additional onsite utilities or underground structures. FES acquired a boring permit from Humboldt County which is included in Appendix A. Surface soil sampling was conducted by excavating a small hole with a clean shovel from 0-0.5 feet bgl. The loose material was mixed with a clean gloved hand and directly placed into a laboratory-supplied container. The shallowest soil samples (0.5-1.0 feet) from SB-5, SB-6, SB-7 and SB-8 were field-composited as described above, following the same procedure used in the *Additional Site Investigation Report* (FES, 2008b). The 0.5-1.0 feet bgl samples from SB-4, SB-5, SB-6, SB-7 and SB-8 were collected with a drive sampler in 6-inch brass liners and were laboratory-homogenized prior to analysis. The soil present in the 0-0.5 feet bgl interval generally consisted of very dark grayish-brown gravel with some very fine sand and silt, except for SB-4 which consisted of very dark grayish brown sand with some silt and fused sand. Soil samples were labeled and placed in an ice-cooled chest immediately after collection.

3.12 Chemical Analysis Methods

Surface soil samples were submitted to TestAmerica, Inc. in West Sacramento, California, for analysis of dioxins and furans utilizing EPA Method 1613. The chain-of-custody and laboratory report are included in Appendix B.

3.13 Chemical Analysis Results

The results of the analysis of all shallow soil samples from the Site for dioxins/furans are presented in Table 1.

The Toxicity Equivalents (TEQs) presented in this report are based on Toxic Equivalency Factors (TEFs) developed by the World Health Organization (World Health Organization, 2005). TEQs are calculated in two ways. One method of calculating total TEQ is to assume that concentrations of non-detected compounds are zero--TEQ (0). The second, more conservative, method of calculating total TEQ is to assume that the concentration of the non-detected compounds is equal to half of the detection limit --TEQ (1/2). TEQs based on both methods are included in the table below.

This investigation used the following applicable regulatory references for dioxin/furan compounds in soil:

- EPA Region 9 Preliminary Remedial Goals (PRGs), residential soil (EPA, 2004); and
- California Human Health Screening Levels (CHHSL), residential land use (CA EPA, 2005).

The results of the dioxin analysis from this investigation are summarized below. Based on these results, no soil samples analyzed for this investigation within the area of the former teepee burner exceeded applicable regulatory standards for residential soils.

PRGs-Residential Soil:		3.9 (pg/g)	3.9 (pg/g)
CHHSL-Residential Land Use:		-	4.6 (pg/g)
Sample ID	**Date Sampled**	**Total TEQ (0)**	**Total TEQ (1/2)**
SB-4 0.5-1.0	5/20/2008	0.002 (pg/g)	0.80 (pg/g)
SB-7 0.0-0.5	5/20/2008	2.233 (pg/g)	3.40 (pg/g)
SB-8 0.0-0.5	5/20/2008	1.336 (pg/g)	2.50 (pg/g)

Notes: TEQ (1/2)-Total TEQs calculated with non-detections calculated as 1/2 the detection limits.
pg/g (picograms per gram)

3.2 Groundwater Grab Sampling

Soil boring SB-4 was deepened with a hand auger to approximately 8.7 feet bgl. The boring was converted into a temporary well point to allow the collection of a groundwater grab sample.

3.21 Field Methods and Observations

The locations of the soil borings are shown on Figures 2 and 3. Soil boring SB-4 was advanced at the former soil sample location SS-2, and one groundwater grab sample was collected from the temporary well point. The boring log and temporary well point construction details are included in Appendices C and D respectively. At soil boring SB-4, the Site subsurface soils consist of silty sands to a depth approximately 5.5 feet bgl, and clean sand to the bottom of the boring at approximately 8.7 feet bgl. Upon completion of the boring, machine-slotted 0.5-inch diameter PVC casing was placed in the boring followed by a sand filter pack as shown on the temporary well construction

drawing in Appendix D. At the time of temporary well installation, a check-valve attached to the end of dedicated tubing was used to remove sediment from the temporary well. Prior to groundwater sampling, a peristaltic pump was used to purge the temporary well. The groundwater grab sample was field-filtered using a 0.45 micron filter and placed into a laboratory-supplied container. The temporary well point was sampled on May 20, 2008. Following sampling, the temporary well was destroyed by removing the casing, removing the well construction materials with a hand auger, and then filling with bentonite pellets from bottom to top.

3.22 Chemical Analysis Methods

The groundwater grab sample was submitted to TestAmerica, Inc. for analysis of dioxins/furans utilizing EPA Method 1613. The chain-of-custody and laboratory report are included in Appendix B.

3.23 Chemical Analysis Results

The results of the analysis of the groundwater grab sample are summarized in Table 2. The results indicate that dioxin/furan compounds were not detected above the laboratory detection limits.

4.0 DATA QUALITY EVALUATION

FES reviewed the laboratory analytical reports to determine if there were any data quality issues. All holding times were met. There were no detections of analytes in the laboratory method blanks. In all cases the laboratory control samples (LCS) were within acceptable limits. The laboratory data is considered to be valid.

5.0 INVESTIGATION DERIVED WASTES

All investigation-derived wastes including soil cuttings, redrilled temporary well materials (sand), purge water, and decontamination water were retained and are being stored in labeled DOT-approved 55-gallon drums at a secured DANCO-owned equipment yard awaiting disposal. Investigation-derived wastes consist of two drum of solids and one drum of liquids. Based on the enclosed analytical data from the investigation, the waste is considered to be non-hazardous and will be disposed following all appropriate rules and regulations. Documentation of disposal will be provided under a separate cover letter.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of this investigation, dioxin/furan compounds were not detected in the groundwater grab sample SB-4 collected at the location of previously reported soil sample SS-2 (within the footprint of the former teepee burner).

None of the soil samples analyzed for this investigation were found to contain dioxin/furan compounds exceeding applicable residential regulatory standards.

The area of soil impacted with dioxin/furan compounds exceeding applicable residential regulatory standards, as determined during the previous Additional Site Investigation (FES 2008b), has been delineated vertically and horizontally. It is limited to an area of approximately 29 feet in diameter to a depth of approximately 0.5 feet bgl, as shown on Figure 4. This area and depth represent a volume of approximately 12 cubic yards. Using a swell factor of 1.25 this would amount to approximately 15 cubic yards (approximately sixty 55-gallon drums) of material for disposal.

FES recommends a limited excavation as shown on Figure 4. It is recommended that soils within the defined area of impact be excavated to a depth of 0.5 feet bgl. FES proposes that the excavated soil be placed in DOT-approved containers. All excavation equipment will be decontaminated by washing with a laboratory grade detergent/water solution followed by a tap water rinse and a final distilled water rinse. Equipment rinse water will also be placed in a DOT-approved container. The containers will be labeled, covered, sealed, and temporarily stored in a secure area at a nearby facility owned by the Site owner. The excavated soil and water will be disposed of following all applicable regulations. A brief letter report is proposed that will document excavation activities and disposal of soil and investigation derived wastes.

7.0 REFERENCES

Ashley, 2007, *California Regional Water Quality Control Board North Coast Region Interoffice Memo, Site Review, Eel River Sawmill Specialty Mill, 2000 Foster Avenue, Arcata, California*, September 4.

California Environmental Protection Agency, 2005, *Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties*, January.

FES, 2007, *Workplan for Additional Site investigation, Former Eel River Sawmill Specialty Mill, 2000 Foster Avenue, Arcata, CA*, October 29.

FES, 2008, *Workplan for Dioxin Assessment, Former Eel River Sawmill Specialty Mill, 2000 Foster Avenue, Arcata, CA*, April 25.

FES, 2008b, FES, 2008, *Additional Site Investigation, Former Eel River Sawmill Specialty Mill, 2000 Foster Avenue, Arcata, CA*, February 29.

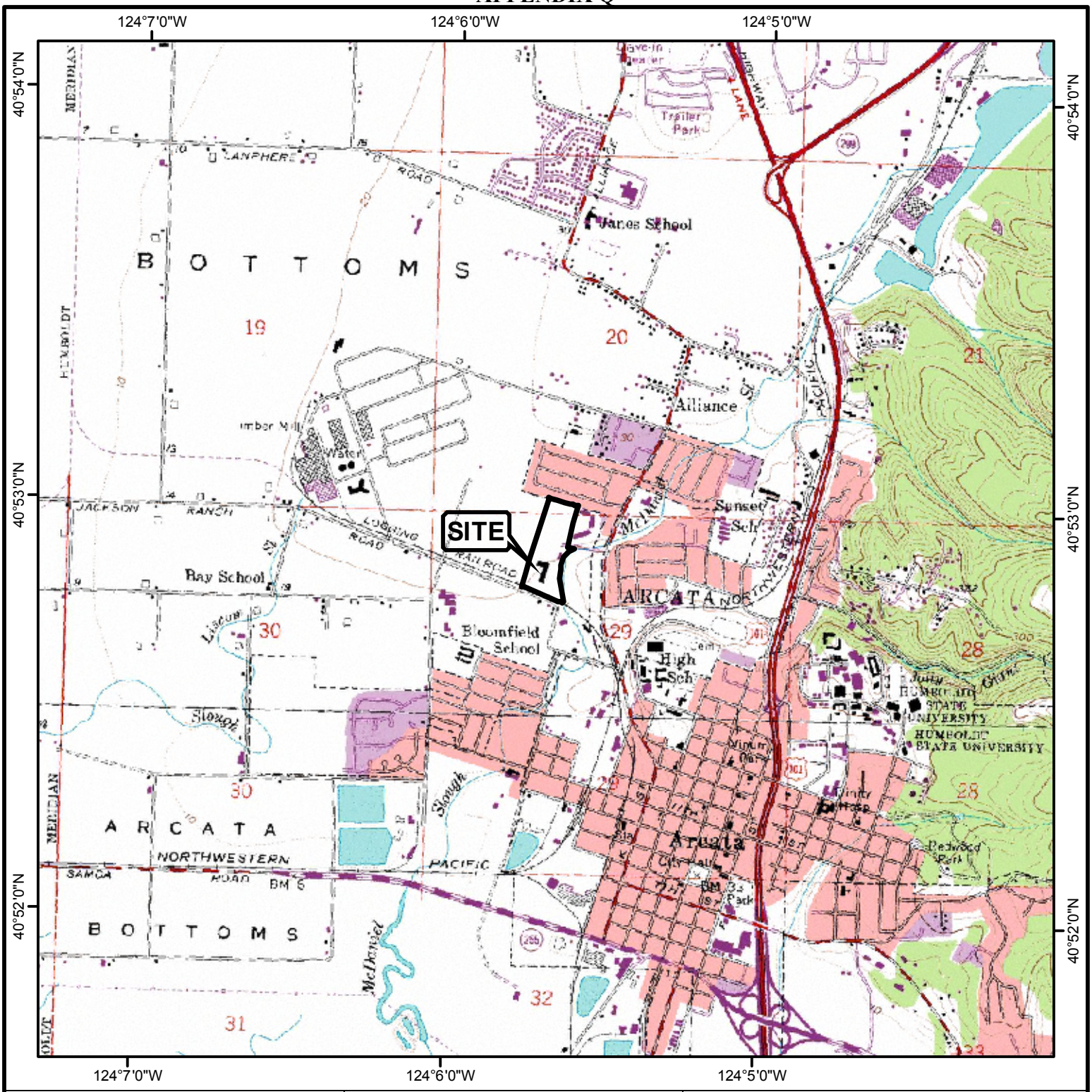
SHN Consulting Engineers & Geologists, Inc. (SHN), 1995*, Initial Groundwater Investigation Report of Findings for 2000 Foster Avenue, Arcata, California*, August.

U.S. Environmental Protection Agency Region 9, 2004, *Preliminary Remediation Goals*.

World Health Organization, 2005, *The 2005 World Health Organization Re-evaluation of Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds.*

APPENDIX Q

FIGURES



N
W E
S

Feet
0 500 1,000 2,000 3,000 4,000

LEGEND

All Locations Approximate

Base Image Data Source:
1:24,000 Digital Raster Graph Mosaic of Humboldt County, California

Foster Ave. LLC

Figure 1
Site Location Map
2000 Foster Avenue
Arcata, California

Freshwater Environmental Services

Date: 8-4-08

By: SJT

APPENDIX Q

N
W
E
S

Feet
0 50 100 200 300 400

LEGEND

Boring Location

Approximate Parcel Boundary

Base Image Data Source:
Obtained from City of Arcata,
Image date August 24, 2003.
All Locations Approximate

Foster Ave. LLC

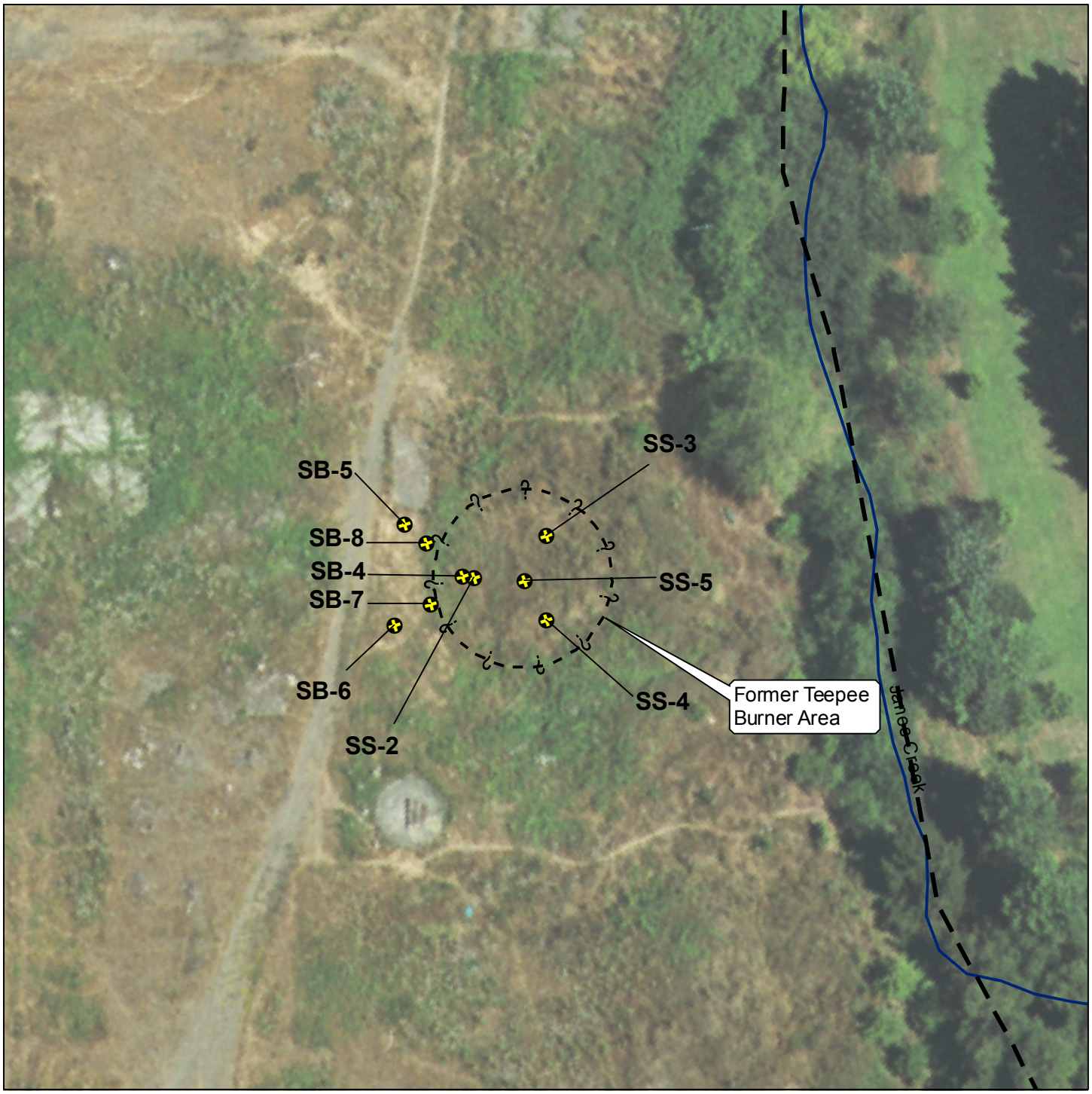
Figure 2

Boring Locations

Freshwater Environmental Services

Date: 8-4-08

By: SJT



N
E
S
W

Feet
0 10 20 40 60 80

LEGEND

Boring Location

Approximate Parcel Boundary

Base Image Data Source:
Obtained from City of Arcata,
Image date August 24, 2003.
All Locations Approximate

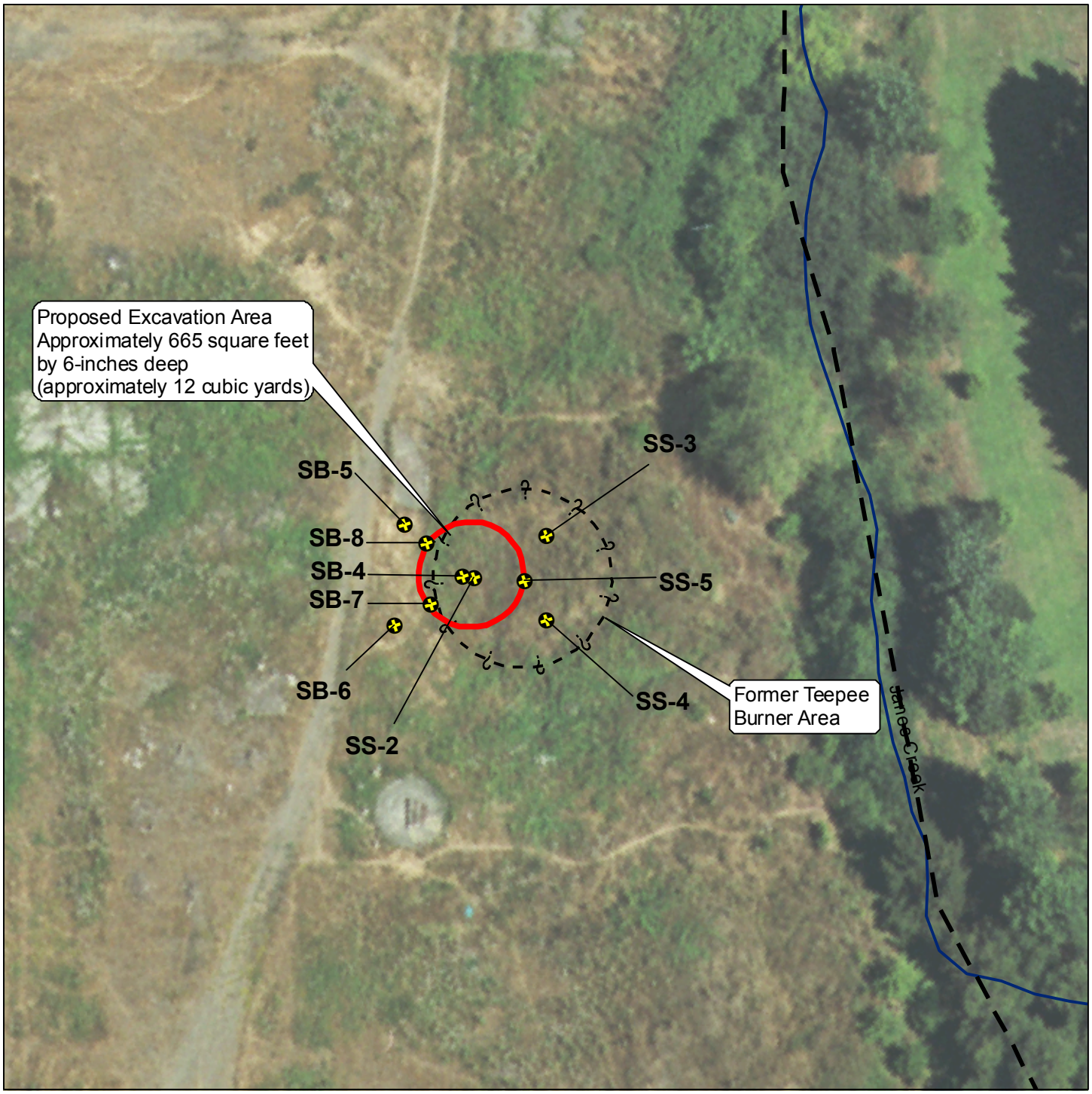
Foster Ave. LLC

Figure 3
Boring Locations
and Approximate Location of
Former Teepee Burner

Freshwater Environmental Services

Date: 8-4-08

By: SJT



N
E
S
W

Feet
0 10 20 40 60 80

LEGEND

Boring Location

Approximate Parcel Boundary

Base Image Data Source:
Obtained from City of Arcata,
Image date August 24, 2003.
All Locations Approximate

Foster Ave. LLC

Figure 4

Site Map with
Proposed Area of Excavation

Freshwater Environmental Services

Date: 8-4-08

By: SJT

APPENDIX Q

TABLES

TABLE 1
SUMMARY OF CHEMICAL ANALYSES OF SOIL SAMPLES
Former Eel River Sawmill Specialty Mill
2000 Foster Avenue
Near Arcata California

Sample ID	Date Sampled	2,3,7,8-TCDD	1,2,3,7,8-PeCDD	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,7,8,9-HxCDD	1,2,3,4,6,7,8-HpCDD	OCDD	2,3,7,8,-TCDF	1,2,3,7,8,-PeCDF	2,3,4,7,8-PeCDF	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDF	2,3,4,6,7,8-HxCDF	1,2,3,7,8,9-HxCDF	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	OCDF	Total TEQ (0)	Total TEQ (1/2)
	Units:	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)	(pg/g)		
PRGs-Residential Soil:		**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**3.9**	**3.9**
CHHSLs-Residential Land Use:		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**4.6**
SS-1	2/8/2008	1.2 J JA	<0.75	<2.1	<2.3	<2.3	28	150	0.93 J CON	<0.44	<0.52	<0.72	<0.64	<0.59	<0.64	4.4 J JA	<0.88	9.5 J	1.66	2.61
SS-2	2/8/2008	1.9	11	8.1 J	75	39	460	1000	2.9 CON	<1.6	<2.1	<3.6	<1.4	<2.5	<0.56	16	<1.1	18	**30.47**	**31.23**
SS-3	2/8/2008	1.5	<1.3	<0.89	3.7 J	<2.9	49	310	0.85 J CON	<0.82	<0.94	<1.6	<0.94	<1.6	<0.34	11	<0.61	22	2.66	3.88
SS-4	2/8/2008	<0.43	<0.7	<0.79	<1.6	<1.2	21	120	<0.45 CON	<0.45	<0.54	<0.7	<0.52	<0.81	<0.54	11	<1.2	12 J	0.36	1.37
SS-5	2/8/2008	<0.28	<0.53	<0.44	<0.5	<0.5	4.5 J	22	<0.46 CON	<0.3	<0.33	<0.72	<0.32	<0.46	<0.32	<3	<0.85	<3.1	0.06	0.74
SS-6	2/8/2008	<0.61	<1.4	<2.1	<2.4	<1.7	28	150	<0.69 CON	<0.35	<0.47	<0.59	<0.44	<0.38	<0.25	4.7 J	<0.5	11 J	0.38	1.9
SB-4 0.5-1.0	5/20/2008	<0.36	<0.78	<0.43	<0.38	<0.38	<0.94	6.5 J	<0.33	<0.39	<0.47	<0.37	<0.36	<0.29	<0.31	<0.60	<0.62	<1.8	0.002	0.80
SB-7 0.0-0.5	5/20/2008	<0.30	<1.3	<1.3	5.7	3.3 J JA	82	550	0.53 J CON	<0.46	<0.55	<1.3	<1.2	<0.90	<0.37	28	<0.91	34	2.233	3.40
SB-8 0.0-0.5	5/20/2008	<0.40	1.2	<1.5	3.2 J	3.3 J	44	270	<0.46 CON	<0.52	<0.64	<0.75	<0.80	<0.92	<0.67	16	<1.7	18	1.336	2.50

Notes:

PRGs USEPA Region 9 Preliminary Remediation Goals (October 2004).
CHHSLs California Human Health Screening Levels (January 2005).
pg/g Picograms per gram or parts per trillion.
TEQ (0) Total TEQs calculated with non-detections calculated as zero.
TEQ (1/2) Total TEQs calculated with non-detections calculated as 1/2 the minimum detection limits.
J The analyte was positively identified. The quantitation is an estimate.
JA The analyte was positively identified, but the quantitation is an estimate.
CON Confirmation analysis.

Dioxins and furans analyzed using EPA Method 1613B.

TABLE 2
SUMMARY OF CHEMICAL ANALYSES OF GROUNDWATER SAMPLE
Former Eel River Sawmill Specialty Mill
2000 Foster Avenue
Near Arcata California

Sample ID	Date Sampled	2,3,7,8-TCDD	1,2,3,7,8-PeCDD	1,2,3,4,7,8-HxCDD	1,2,3,6,7,8-HxCDD	1,2,3,7,8,9-HxCDD	1,2,3,4,6,7,8-HpCDD	OCDD	2,3,7,8,-TCDF	1,2,3,7,8,-PeCDF	2,3,4,7,8-PeCDF	1,2,3,4,7,8-HxCDF	1,2,3,6,7,8-HxCDF	2,3,4,6,7,8-HxCDF	1,2,3,7,8,9-HxCDF	1,2,3,4,6,7,8-HpCDF	1,2,3,4,7,8,9-HpCDF	OCDF	Total TEQ (0)
	Units:	**(pg/L)**	**(pg/L)**	**(pg/L)**	**(pg/L)**	**(pg/L)**	**(pg/L)**	**(pg/L)**	**(pg/L)**	**(pg/L)**	**(pg/L)**	**(pg/L)**	**(pg/L)**	**(pg/L)**	**(pg/L)**	**(pg/L)**	**(pg/L)**	**(pg/L)**	
SB-4	5/20/2008	<0.70	<1.1	<0.52	<0.82	<0.46	<1.9	<9.4	<0.35	<0.30	<0.34	<0.52	<0.45	<0.35	<0.45	<38	<51	<4.3	0

Notes:

pg/L Picograms per liter or parts per quadrillion.

TEQ (0) Total TEQs calculated with non-detections calculated as zero.

Dioxins and furans analyzed using EPA Method 1613B.

APPENDICES

APPENDIX A

Humboldt County Boring Permit

APPENDIX Q

WELL and BORING PERMIT APPLICATION

MAY - 6 2008

HUMBOLDT CO. DIVISION OF ENVIRONMENTAL HEALT

Facility ID # 1NHU518 Permit # 697-F

Facility Name: Former Eel River Sawmill Specialty Mill

Site Address: 2000 Foster Avenue Arcata, California

Site Owner: Foster Avenue, LLC Telephone: 707-822-9000

Address: 5251 Erickson Way Arcata, California AP#: 505-161-11

RP Name: Foster Avenue, LLC Telephone: 707-269-7553

Address: 5251 Erickson Way Arcata, California

Consultant: Freshwater Environmental Services, Stan Thiesen Telephone: (707) 839-0091

Address: 1372 Anderson McKinleyville, California 95519 Reg.#/Type: P.G. #7990

Driller: Hand Auger by Freshwater Telephone: (707) 839-0091

Address: C-57 Lic.#:

# On-site		# Off-site	
Wells	Borings 3	Wells	Borings

Activity: ☒ Construct ☐ Destroy ☐ Repair/Modify Electrode Type:

Well Type: ☐ Monitoring Well ☐ Injection Well ☐ Vapor Extraction ☐ Geologic Boring
☐ Extraction Well ☐ Piezometer ☐ Vapor Point ☐ Soil Gas Survey
☐ Vadose Well ☐ Cathodic Protection ☐ Direct Push Boring ☒ Temporary Well Point

Investigation Type: ☒ Site Assessment ☐ Disposal Practice ☐ UST ☐ Other*
☐ Surface Contamination ☐ Surface Impoundment ☐ AST
*Specify:

Investigation Phase: ☐ Initial ☒ Subsequent ☐ Remediation ☐ Closure

Suspected Contaminants: Dioxin/furan

Disposal/Containment for Soil Cuttings: DOT container

Disposal/Containment for Rinsate: DOT container

Disposal/Containment for Development Water: DOT container

Permits will not be processed with out the following information:

☐ Scaled Construction Detail
☒ Appropriate Fees
☒ Detailed Site Plan
☒ Copy of Workplan (if not on file at HCDEH)
☒ Lead Agency Approval Letter
☐ Off Site Well Requirements:
  ☐ Legal Right of Entry
  ☐ Off Site Address/Location
  ☐ Encroachment Permit
  ☐ Coastal Zone Permit

Proposed Work Date: May 12, 2008

rev. 6/98

APPENDIX Q

HUMBOLDT COUNTY DIVISION of ENVIRONMENTAL HEALTH - HAZARDOUS MATERIALS UNIT
WELL and BORING PERMIT APPLICATION

Facility ID # 1NHU518 **Permit #** _____

I hereby agree to comply with all laws, ordinances and regulations of the county of Humboldt and State of California pertaining to water well construction. I will contact the Humboldt County Hazardous Materials Unit at (707) 445-6215 five (5) working days prior to commencing this work. I will furnish to the County of Humboldt, Division of Environmental Health, and the owner a legible copy of the State Water Well Completion Report (form DWR 188) within fifteen (15) days after completion of work to obtain final approval of the well(s). I acknowledge that the application will become a permit ONLY after site approval by the Local Implementing Agency (HCDEH, NCRWQCB, DTSC, EPA). I understand this permit is not transferable and expires one hundred twenty (120) days from the date of issuance.

Certificates of Insurance:

☐ A currently effective General Liability Certificate of Insurance is on file with this office, endorsed to include the Humboldt County Division of Environmental Health as additional named insured.

☐ A currently effective Worker's Compensation Certificate of Insurance is on file with this office, endorsed to include the Humboldt County Division of Environmental Health as additional named insured.

_____ _____

Signature of Well Driller - no proxies - original signature only in blue ink Date

- **Well identification number and type must be affixed to exterior surface of security structure.**
- **The applicant is responsible for notifying Underground Services Alert at least 48 hours prior to the scheduled work date.**
- **A State of California Department of Water resources Well Completion Report (Form DWR 1-88) must be filed within 15 days of completion of work for all well completions and destructions.**
- **A licensed California C-57 Well Driller is required for all wells and direct push work.**

FOR OFFICE USE ONLY

Permit Approval: _____ **Date:** 5-6-08

Fee: $104. **Date:** 5-6-08 **Receipt:** Inv #

Initial Inspection: _____ **Date:** _____

Final Inspection: _____ **Date:** _____

APPENDIX B

Laboratory Reports and Chain-of-Custody Records

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

June 25, 2008

TestAmerica Project Number: G8E220367
PO/Contract:

Orrin Plocher
Freshwater Environmental Services
1372 Anderson Avenue
McKinleyville, CA 95519

Dear Mr. Plocher,

This report contains the analytical results for the samples received under chain of custody by TestAmerica on May 22, 2008. These samples are associated with your Foster Avenue, LLC project.

The test results in this report meet all NELAC requirements for parameters that accreditation is required or available. Any exceptions to NELAC requirements are noted in the case narrative. The case narrative is an integral part of this report.

If you have any questions, please feel free to call me at (916) 374-4383.

Sincerely,

David R. Alltucker
Project Manager

Table of Contents

TestAmerica West Sacramento Project Number G8E220367

Case Narrative

Quality Assurance Program

Sample Description Information

Chain of Custody Documentation

WATER, 1613B, Dioxins/Furans, HRGC/HRMS
Sample: 1
- Sample Data Sheet
- Method Blank Report
- Laboratory QC Reports

SOLID, 1613B, Dioxins/Furans, HRGC/HRMS
Samples: 2, 3, 4
- Sample Data Sheets
- Method Blank Report
- Laboratory QC Reports

SOLID, D 2216-90, Percent Moisture
Samples: 2, 3, 4
- Sample Data Sheets
- Laboratory QC Reports

Case Narrative

TestAmerica West Sacramento Project Number G8E220367

SOLID, 1613B, Dioxins/Furans, HRGC/HRMS
Sample(s): 3, 4
The result for 2, 3, 7, 8-TCDF is reported from the confirmation analysis that occurred on June 24, 2008.

Sample(s): 3
The isomer 1,2,3,7,8,9-HxCDD has been qualified with the "JA" flag due to the ion abundance ratio being outside of criteria. The isomer has been reported as an "estimated maximum possible concentration" (EMPC) because the quantitation is based on the theoretical ion abundance ratio for this analyte.

There were no other anomalies associated with this project.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

ACCREDITED IN ACCORDANCE WITH nelac

TestAmerica Laboratories West Sacramento Certifications/Accreditations

Certifying State	Certificate #	Certifying State	Certificate #
Alaska	UST-055	New York*	11666
Arizona	AZ0616	Oregon*	CA 200005
Arkansas	04-067-0	Pennsylvania	68-1272
California*	01119CA	South Carolina	87014002
Colorado	NA	Texas	TX 270-2004A
Connecticut	PH-0691	Utah*	QUAN1
Florida*	E87570	Virginia	00178
Georgia	960	Washington	C087
Hawaii	NA	West Virginia	9930C, 334
Kansas*	E10375	Wisconsin	998204680
Louisiana*	01944	NFESC	NA
Michigan	9947	USACE	NA
Nevada	CA44	USDA Foreign Plant	37-82605
New Jersey*	CA005	USDA Foreign Soil	S-46613

*NELAP accredited. A more detailed parameter list is available upon request. Updated 9/21/07

QC Parameter Definitions

QC Batch: The QC batch consists of a set of up to 20 field samples that behave similarly (i.e., same matrix) and are processed using the same procedures, reagents, and standards at the same time.

Method Blank: An analytical control consisting of all reagents, which may include internal standards and surrogates, and is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background contamination.

Laboratory Control Sample and Laboratory Control Sample Duplicate (LCS/LCSD): An aliquot of blank matrix spiked with known amounts of representative target analytes. The LCS (and LCSD as required) is carried through the entire analytical process and is used to monitor the accuracy of the analytical process independent of potential matrix effects. If an LCSD is performed, it may also be used to evaluate the precision of the process.

Duplicate Sample (DU): Different aliquots of the same sample are analyzed to evaluate the precision of an analysis.

Surrogates: Organic compounds not expected to be detected in field samples, which behave similarly to target analytes. These are added to every sample within a batch at a known concentration to determine the efficiency of the sample preparation and analytical process.

Matrix Spike and Matrix Spike Duplicate (MS/MSD): An MS is an aliquot of a matrix fortified with known quantities of specific compounds and subjected to an entire analytical procedure in order to indicate the appropriateness of the method for a particular matrix. The percent recovery for the respective compound(s) is then calculated. The MSD is a second aliquot of the same matrix as the matrix spike, also spiked, in order to determine the precision of the method.

Isotope Dilution: For isotope dilution methods, isotopically labeled analogs (internal standards) of the native target analytes are spiked into the sample at time of extraction. These internal standards are used for quantitation, and monitor and correct for matrix effects. Since matrix effects on method performance can be judged by the recovery of these analogs, there is little added benefit of performing MS/MSD for these methods. MS/MSD are only performed for client or QAPP requirements.

Control Limits: The reported control limits are either based on laboratory historical data, method requirements, or project data quality objectives. The control limits represent the estimated uncertainty of the test results.

Sample Summary

TestAmerica West Sacramento Project Number G8E220367

WO#	Sample #	Client Sample ID	Sampling Date	Received Date
KNQDE	1	SB-4	5/20/2008 01:00 PM	5/22/2008 09:15 AM
KNQDG	2	SB-4 0.5-1.0	5/20/2008 09:00 AM	5/22/2008 09:15 AM
KNQDH	3	SB-7 0.0-0.5	5/20/2008 12:48 PM	5/22/2008 09:15 AM
KNQDK	4	SB-8 0.0-0.5	5/20/2008 12:52 PM	5/22/2008 09:15 AM

Notes(s):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity, pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight

WATER, 1613B, Dioxins/Furans, HRGC/HRMS

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-4

Lot-Sample #...:	G8E220367 - 001	**Work Order #...:**	KNQDE1AA	**Matrix....:**	WATER
Date Sampled...:	05/20/08	**Date Received..:**	05/22/08	**Instrument:**	4D5
Prep Date.....:	06/02/08	**Analysis Date..:**	06/19/08	**Units.....:**	pg/L
Prep Batch #...:	8154481	**Dilution Factor:**	1	**% Moisture:**	

PARAMETER	RESULT	DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	ND	0.70	1.000	0
Total TCDD	ND	0.70		0
1,2,3,7,8-PeCDD	ND	1.1	0.500	0
Total PeCDD	ND	1.1		0
1,2,3,4,7,8-HxCDD	ND	0.52	0.100	0
1,2,3,6,7,8-HxCDD	ND	0.82	0.100	0
1,2,3,7,8,9-HxCDD	ND	0.46	0.100	0
Total HxCDD	ND	0.82		0
1,2,3,4,6,7,8-HpCDD	ND	1.9	0.010	0
Total HpCDD	ND	1.9		0
OCDD	ND	9.4	0.001	0
2,3,7,8-TCDF	ND	0.35	0.100	0
Total TCDF	ND	0.47		0
1,2,3,7,8-PeCDF	ND	0.30	0.050	0
2,3,4,7,8-PeCDF	ND	0.34	0.500	0
Total PeCDF	ND	0.35		0
1,2,3,4,7,8-HxCDF	ND	0.52	0.100	0
1,2,3,6,7,8-HxCDF	ND	0.45	0.100	0
2,3,4,6,7,8-HxCDF	ND	0.35	0.100	0
1,2,3,7,8,9-HxCDF	ND	0.45	0.100	0
Total HxCDF	ND	0.52		0
1,2,3,4,6,7,8-HpCDF	ND	38	0.010	0
1,2,3,4,7,8,9-HpCDF	ND	51	0.010	0
Total HpCDF	ND	51		0
OCDF	ND	4.3	0.001	0
Total TEQ Concentration				**0**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	57	25 - 164
13C-1,2,3,7,8-PeCDD	51	25 - 181
13C-1,2,3,4,7,8-HxCDD	47	32 - 141
13C-1,2,3,6,7,8-HxCDD	49	28 - 130
13C-1,2,3,4,6,7,8-HpCDD	53	23 - 140
13C-OCDD	42	17 - 157
13C-2,3,7,8-TCDF	56	24 - 169
13C-1,2,3,7,8-PeCDF	52	24 - 185
13C-2,3,4,7,8-PeCDF	50	21 - 178
13C-1,2,3,6,7,8-HxCDF	49	26 - 123
13C-2,3,4,6,7,8-HxCDF	54	28 - 136
13C-1,2,3,7,8,9-HxCDF	50	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	49	28 - 143
13C-1,2,3,4,7,8,9-HpCDF	48	26 - 138
13C-1,2,3,4,7,8-HxCDF	46	26 - 152

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-4

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	98	35 - 197

Notes:

TEF values are cited in U.S. Environmental Protection Agency, (1989) Interim procedures for estimating risks associated with exposures to mixtures of chlorinated dibenzo-p-dioxins and -dibenzofurans (CDDs and CDFs) and 1989 update. U.S. Environmental Protection Agency, Risk Assessment forum, Washington, DC; EPA/625/3-89/016

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-4

Lot-Sample #...:	G8E220367 - 001	**Work Order #...:**	KNQDE1AA	**Matrix.....:**	WATER
Date Sampled...:	05/20/08	**Date Received..:**	05/22/08	**Instrument:**	4D5
Prep Date.....:	06/02/08	**Analysis Date..:**	06/19/08	**Units.....:**	pg/L
Prep Batch #...:	8154481	**Dilution Factor:**	1	**% Moisture:**	

PARAMETER	RESULT	DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	ND	0.70	1.0	0.35
Total TCDD	ND	0.70		
1,2,3,7,8-PeCDD	ND	1.1	0.50	0.28
Total PeCDD	ND	1.1		
1,2,3,4,7,8-HxCDD	ND	0.52	0.10	0.026
1,2,3,6,7,8-HxCDD	ND	0.82	0.10	0.041
1,2,3,7,8,9-HxCDD	ND	0.46	0.10	0.023
Total HxCDD	ND	0.82		
1,2,3,4,6,7,8-HpCDD	ND	1.9	0.010	0.0095
Total HpCDD	ND	1.9		
OCDD	ND	9.4	0.0010	0.0047
2,3,7,8-TCDF	ND	0.35	0.10	0.018
Total TCDF	ND	0.47		
1,2,3,7,8-PeCDF	ND	0.30	0.050	0.0075
2,3,4,7,8-PeCDF	ND	0.34	0.50	0.085
Total PeCDF	ND	0.35		
1,2,3,4,7,8-HxCDF	ND	0.52	0.10	0.026
1,2,3,6,7,8-HxCDF	ND	0.45	0.10	0.022
2,3,4,6,7,8-HxCDF	ND	0.35	0.10	0.018
1,2,3,7,8,9-HxCDF	ND	0.45	0.10	0.022
Total HxCDF	ND	0.52		
1,2,3,4,6,7,8-HpCDF	ND	38	0.010	0.19
1,2,3,4,7,8,9-HpCDF	ND	51	0.010	0.25
Total HpCDF	ND	51		
OCDF	ND	4.3	0.0010	0.0022
Total TEQ Concentration				1.4

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	57	25 - 164
13C-1,2,3,7,8-PeCDD	51	25 - 181
13C-1,2,3,4,7,8-HxCDD	47	32 - 141
13C-1,2,3,6,7,8-HxCDD	49	28 - 130
13C-1,2,3,4,6,7,8-HpCDD	53	23 - 140
13C-OCDD	42	17 - 157
13C-2,3,7,8-TCDF	56	24 - 169
13C-1,2,3,7,8-PeCDF	52	24 - 185
13C-2,3,4,7,8-PeCDF	50	21 - 178
13C-1,2,3,6,7,8-HxCDF	49	26 - 123
13C-2,3,4,6,7,8-HxCDF	54	28 - 136
13C-1,2,3,7,8,9-HxCDF	50	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	49	28 - 143
13C-1,2,3,4,7,8,9-HpCDF	48	26 - 138
13C-1,2,3,4,7,8-HxCDF	46	26 - 152

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-4

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	98	35 - 197

Notes:

ND TEQ Conc. = (EDL/2) * TEF Factor

TEF values used are cited in U.S. Environmental Protection Agency. (1989) Interim procedures for estimating risks associated with exposures to mixtures of chlorinated dibenzo-p-dioxins and -dibenzofurans (CDDs and CDFs) and 1989 update. U.S. Envrionmental Protection Agency, Risk Assessment forum, Washington, DC; EPA/625/3-89/016.

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-4

Lot-Sample #...:	G8E220367 - 001	**Work Order #...:**	KNQDE1AA	**Matrix....:**	WATER
Date Sampled...:	05/20/08	**Date Received..:**	05/22/08	**Instrument:**	4D5
Prep Date.....:	06/02/08	**Analysis Date..:**	06/19/08	**Units.....:**	pg/L
Prep Batch #...:	8154481	**Dilution Factor:**	1	**% Moisture:**	

PARAMETER	RESULT	DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	ND	0.70	1	0
Total TCDD	ND	0.70		0
1,2,3,7,8-PeCDD	ND	1.1	1	0
Total PeCDD	ND	1.1		0
1,2,3,4,7,8-HxCDD	ND	0.52	0.1	0
1,2,3,6,7,8-HxCDD	ND	0.82	0.1	0
1,2,3,7,8,9-HxCDD	ND	0.46	0.1	0
Total HxCDD	ND	0.82		0
1,2,3,4,6,7,8-HpCDD	ND	1.9	0.01	0
Total HpCDD	ND	1.9		0
OCDD	ND	9.4	0.0003	0
2,3,7,8-TCDF	ND	0.35	0.1	0
Total TCDF	ND	0.47		0
1,2,3,7,8-PeCDF	ND	0.30	0.03	0
2,3,4,7,8-PeCDF	ND	0.34	0.3	0
Total PeCDF	ND	0.35		0
1,2,3,4,7,8-HxCDF	ND	0.52	0.1	0
1,2,3,6,7,8-HxCDF	ND	0.45	0.1	0
2,3,4,6,7,8-HxCDF	ND	0.35	0.1	0
1,2,3,7,8,9-HxCDF	ND	0.45	0.1	0
Total HxCDF	ND	0.52		0
1,2,3,4,6,7,8-HpCDF	ND	38	0.01	0
1,2,3,4,7,8,9-HpCDF	ND	51	0.01	0
Total HpCDF	ND	51		0
OCDF	ND	4.3	0.0003	0
Total TEQ Concentration				**0**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	57	25 - 164
13C-1,2,3,7,8-PeCDD	51	25 - 181
13C-1,2,3,4,7,8-HxCDD	47	32 - 141
13C-1,2,3,6,7,8-HxCDD	49	28 - 130
13C-1,2,3,4,6,7,8-HpCDD	53	23 - 140
13C-OCDD	42	17 - 157
13C-2,3,7,8-TCDF	56	24 - 169
13C-1,2,3,7,8-PeCDF	52	24 - 185
13C-2,3,4,7,8-PeCDF	50	21 - 178
13C-1,2,3,6,7,8-HxCDF	49	26 - 123
13C-2,3,4,6,7,8-HxCDF	54	28 - 136
13C-1,2,3,7,8,9-HxCDF	50	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	49	28 - 143
13C-1,2,3,4,7,8,9-HpCDF	48	26 - 138
13C-1,2,3,4,7,8-HxCDF	46	26 - 152

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-4

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	98	35 - 197

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

APPENDIX Q

QC DATA ASSOCIATION SUMMARY

G8E220367

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	WATER	EPA-5 1613B		8154481	
002	SOLID	EPA-5 1613B		8161259	
	SOLID	ASTM D 2216-90		8154357	8154184
003	SOLID	EPA-5 1613B		8161259	
	SOLID	ASTM D 2216-90		8154357	8154184
004	SOLID	EPA-5 1613B		8161259	
	SOLID	ASTM D 2216-90		8154357	8154184

APPENDIX Q

METHOD BLANK REPORT

Trace Level Organic Compounds

Client Lot #...: G8E220367 **Work Order #...:** KN8G21AA **Matrix.....:** WATER
MB Lot-Sample #: G8F020000-481

Prep Date.....: 06/02/08
Analysis Date..: 06/16/08 **Prep Batch #...:** 8154481
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND	8.7	pg/L	EPA-5 1613B
Total TCDD	ND	8.7	pg/L	EPA-5 1613B
1,2,3,7,8-PeCDD	ND	21	pg/L	EPA-5 1613B
Total PeCDD	ND	21	pg/L	EPA-5 1613B
1,2,3,4,7,8-HxCDD	ND	14	pg/L	EPA-5 1613B
1,2,3,6,7,8-HxCDD	ND	11	pg/L	EPA-5 1613B
1,2,3,7,8,9-HxCDD	ND	11	pg/L	EPA-5 1613B
Total HxCDD	ND	14	pg/L	EPA-5 1613B
1,2,3,4,6,7,8-HpCDD	ND	18	pg/L	EPA-5 1613B
Total HpCDD	ND	18	pg/L	EPA-5 1613B
OCDD	ND	36	pg/L	EPA-5 1613B
2,3,7,8-TCDF	ND	4.6	pg/L	EPA-5 1613B
Total TCDF	ND	4.6	pg/L	EPA-5 1613B
1,2,3,7,8-PeCDF	ND	14	pg/L	EPA-5 1613B
2,3,4,7,8-PeCDF	ND	16	pg/L	EPA-5 1613B
Total PeCDF	ND	16	pg/L	EPA-5 1613B
1,2,3,4,7,8-HxCDF	ND	8.8	pg/L	EPA-5 1613B
1,2,3,6,7,8-HxCDF	ND	8.1	pg/L	EPA-5 1613B
2,3,4,6,7,8-HxCDF	ND	8.1	pg/L	EPA-5 1613B
1,2,3,7,8,9-HxCDF	ND	11	pg/L	EPA-5 1613B
Total HxCDF	ND	11	pg/L	EPA-5 1613B
1,2,3,4,6,7,8-HpCDF	ND	11	pg/L	EPA-5 1613B
1,2,3,4,7,8,9-HpCDF	ND	18	pg/L	EPA-5 1613B
Total HpCDF	ND	18	pg/L	EPA-5 1613B
OCDF	ND	36	pg/L	EPA-5 1613B

(Continued on next page)

APPENDIX Q

METHOD BLANK REPORT

Trace Level Organic Compounds

Client Lot #...: G8E220367 **Work Order #...:** KN8G21AA **Matrix.....:** WATER

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
	PERCENT	RECOVERY		
INTERNAL STANDARDS	RECOVERY	LIMITS		
13C-2,3,7,8-TCDD	38	(25 - 164)		
13C-1,2,3,7,8-PeCDD	39	(25 - 181)		
13C-1,2,3,4,7,8-HxCDD	42	(32 - 141)		
13C-1,2,3,6,7,8-HxCDD	55	(28 - 130)		
13C-1,2,3,4,6,7,8-HpCDD	45	(23 - 140)		
13C-OCDD	42	(17 - 157)		
13C-2,3,7,8-TCDF	38	(24 - 169)		
13C-1,2,3,7,8-PeCDF	40	(24 - 185)		
13C-2,3,4,7,8-PeCDF	42	(21 - 178)		
13C-1,2,3,6,7,8-HxCDF	53	(26 - 123)		
13C-2,3,4,6,7,8-HxCDF	54	(28 - 136)		
13C-1,2,3,7,8,9-HxCDF	49	(29 - 147)		
13C-1,2,3,4,6,7,8-HpCDF	51	(28 - 143)		
13C-1,2,3,4,7,8,9-HpCDF	45	(26 - 138)		
13C-1,2,3,4,7,8-HxCDF	47	(26 - 152)		
	PERCENT	RECOVERY		
SURROGATE	RECOVERY	LIMITS		
37Cl4-2,3,7,8-TCDD	94	(35 - 197)		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

APPENDIX Q

LABORATORY CONTROL SAMPLE DATA REPORT

Trace Level Organic Compounds

Client Lot #...: G8E220367 **Work Order #...:** KN8G21AC **Matrix.....:** WATER
LCS Lot-Sample#: G8F020000-481
Prep Date.....: 06/02/08 **Analysis Date..:** 06/16/08
Prep Batch #...: 8154481
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
2,3,7,8-TCDD	200	213	pg/L	106	EPA-5 1613B
1,2,3,7,8-PeCDD	1000	1080	pg/L	108	EPA-5 1613B
1,2,3,4,7,8-HxCDD	1000	1070	pg/L	107	EPA-5 1613B
1,2,3,6,7,8-HxCDD	1000	1040	pg/L	104	EPA-5 1613B
1,2,3,7,8,9-HxCDD	1000	1180	pg/L	118	EPA-5 1613B
1,2,3,4,6,7,8-HpCDD	1000	1080	pg/L	108	EPA-5 1613B
OCDD	2000	2280	pg/L	114	EPA-5 1613B
2,3,7,8-TCDF	200	206	pg/L	103	EPA-5 1613B
1,2,3,7,8-PeCDF	1000	1100	pg/L	110	EPA-5 1613B
2,3,4,7,8-PeCDF	1000	1110	pg/L	111	EPA-5 1613B
1,2,3,4,7,8-HxCDF	1000	1150	pg/L	115	EPA-5 1613B
1,2,3,6,7,8-HxCDF	1000	1090	pg/L	109	EPA-5 1613B
2,3,4,6,7,8-HxCDF	1000	1120	pg/L	112	EPA-5 1613B
1,2,3,7,8,9-HxCDF	1000	1150	pg/L	115	EPA-5 1613B
1,2,3,4,6,7,8-HpCDF	1000	1080	pg/L	108	EPA-5 1613B
1,2,3,4,7,8,9-HpCDF	1000	1070	pg/L	107	EPA-5 1613B
OCDF	2000	2370	pg/L	118	EPA-5 1613B

(Continued on next page)

APPENDIX Q

LABORATORY CONTROL SAMPLE DATA REPORT

Trace Level Organic Compounds

Client Lot #...: G8E220367 **Work Order #...:** KN8G21AC **Matrix.....:** WATER
LCS Lot-Sample#: G8F020000-481

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	38	(25 - 164)
13C-1,2,3,7,8-PeCDD	35	(25 - 181)
13C-1,2,3,4,7,8-HxCDD	41	(32 - 141)
13C-1,2,3,6,7,8-HxCDD	38	(28 - 130)
13C-1,2,3,4,6,7,8-HpCDD	39	(23 - 140)
13C-OCDD	37	(17 - 157)
13C-2,3,7,8-TCDF	39	(24 - 169)
13C-1,2,3,7,8-PeCDF	36	(24 - 185)
13C-2,3,4,7,8-PeCDF	37	(21 - 178)
13C-1,2,3,6,7,8-HxCDF	41	(26 - 123)
13C-2,3,4,6,7,8-HxCDF	43	(28 - 136)
13C-1,2,3,7,8,9-HxCDF	41	(29 - 147)
13C-1,2,3,4,6,7,8-HpCDF	39	(28 - 143)
13C-1,2,3,4,7,8,9-HpCDF	39	(26 - 138)
13C-1,2,3,4,7,8-HxCDF	37	(26 - 152)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	91	(35 - 197)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

APPENDIX Q

LABORATORY CONTROL SAMPLE EVALUATION REPORT

Trace Level Organic Compounds

Client Lot #...: G8E220367 **Work Order #...:** KN8G21AC **Matrix.....:** WATER
LCS Lot-Sample#: G8F020000-481
Prep Date.....: 06/02/08 **Analysis Date..:** 06/16/08
Prep Batch #...: 8154481
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
2,3,7,8-TCDD	106	(67 - 158)	EPA-5 1613B
1,2,3,7,8-PeCDD	108	(70 - 142)	EPA-5 1613B
1,2,3,4,7,8-HxCDD	107	(70 - 164)	EPA-5 1613B
1,2,3,6,7,8-HxCDD	104	(76 - 134)	EPA-5 1613B
1,2,3,7,8,9-HxCDD	118	(64 - 162)	EPA-5 1613B
1,2,3,4,6,7,8-HpCDD	108	(70 - 140)	EPA-5 1613B
OCDD	114	(78 - 144)	EPA-5 1613B
2,3,7,8-TCDF	103	(75 - 158)	EPA-5 1613B
1,2,3,7,8-PeCDF	110	(80 - 134)	EPA-5 1613B
2,3,4,7,8-PeCDF	111	(68 - 160)	EPA-5 1613B
1,2,3,4,7,8-HxCDF	115	(72 - 134)	EPA-5 1613B
1,2,3,6,7,8-HxCDF	109	(84 - 130)	EPA-5 1613B
2,3,4,6,7,8-HxCDF	112	(70 - 156)	EPA-5 1613B
1,2,3,7,8,9-HxCDF	115	(78 - 130)	EPA-5 1613B
1,2,3,4,6,7,8-HpCDF	108	(82 - 122)	EPA-5 1613B
1,2,3,4,7,8,9-HpCDF	107	(78 - 138)	EPA-5 1613B
OCDF	118	(63 - 170)	EPA-5 1613B

(Continued on next page)

APPENDIX Q

LABORATORY CONTROL SAMPLE EVALUATION REPORT

Trace Level Organic Compounds

Client Lot #...: G8E220367 **Work Order #...:** KN8G21AC **Matrix.....:** WATER
LCS Lot-Sample#: G8F020000-481

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	38	(25 - 164)
13C-1,2,3,7,8-PeCDD	35	(25 - 181)
13C-1,2,3,4,7,8-HxCDD	41	(32 - 141)
13C-1,2,3,6,7,8-HxCDD	38	(28 - 130)
13C-1,2,3,4,6,7,8-HpCDD	39	(23 - 140)
13C-OCDD	37	(17 - 157)
13C-2,3,7,8-TCDF	39	(24 - 169)
13C-1,2,3,7,8-PeCDF	36	(24 - 185)
13C-2,3,4,7,8-PeCDF	37	(21 - 178)
13C-1,2,3,6,7,8-HxCDF	41	(26 - 123)
13C-2,3,4,6,7,8-HxCDF	43	(28 - 136)
13C-1,2,3,7,8,9-HxCDF	41	(29 - 147)
13C-1,2,3,4,6,7,8-HpCDF	39	(28 - 143)
13C-1,2,3,4,7,8,9-HpCDF	39	(26 - 138)
13C-1,2,3,4,7,8-HxCDF	37	(26 - 152)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	91	(35 - 197)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

SOLID, 1613B, Dioxins/Furans, HRGC/HRMS

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-4 0.5-1.0

Lot-Sample #...:	G8E220367 - 002	**Work Order #...:**	KNQDG1AC	**Matrix....:**	SOLID
Date Sampled...:	05/20/08	**Date Received..:**	05/22/08	**Instrument:**	5D5
Prep Date.....:	06/09/08	**Analysis Date..:**	06/22/08	**Units.....:**	pg/g
Prep Batch #...:	8161259	**Dilution Factor:**	1	**% Moisture:**	16

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	ND		0.36	1.000	0
Total TCDD	ND		0.36		0
1,2,3,7,8-PeCDD	ND		0.78	0.500	0
Total PeCDD	ND		0.78		0
1,2,3,4,7,8-HxCDD	ND		0.43	0.100	0
1,2,3,6,7,8-HxCDD	ND		0.38	0.100	0
1,2,3,7,8,9-HxCDD	ND		0.38	0.100	0
Total HxCDD	ND		0.43		0
1,2,3,4,6,7,8-HpCDD	ND		0.94	0.010	0
Total HpCDD	ND		0.94		0
OCDD	**6.5**	**J**		**0.001**	**0.0065**
2,3,7,8-TCDF	ND		0.33	0.100	0
Total TCDF	ND		0.33		0
1,2,3,7,8-PeCDF	ND		0.39	0.050	0
2,3,4,7,8-PeCDF	ND		0.47	0.500	0
Total PeCDF	ND		0.47		0
1,2,3,4,7,8-HxCDF	ND		0.37	0.100	0
1,2,3,6,7,8-HxCDF	ND		0.36	0.100	0
2,3,4,6,7,8-HxCDF	ND		0.29	0.100	0
1,2,3,7,8,9-HxCDF	ND		0.31	0.100	0
Total HxCDF	ND		0.37		0
1,2,3,4,6,7,8-HpCDF	ND		0.60	0.010	0
1,2,3,4,7,8,9-HpCDF	ND		0.62	0.010	0
Total HpCDF	ND		0.62		0
OCDF	ND		1.8	0.001	0
Total TEQ Concentration					**0.0065**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	85	25 - 164
13C-1,2,3,7,8-PeCDD	64	25 - 181
13C-1,2,3,4,7,8-HxCDD	82	32 - 141
13C-1,2,3,6,7,8-HxCDD	87	28 - 130
13C-1,2,3,4,6,7,8-HpCDD	78	23 - 140
13C-OCDD	42	17 - 157
13C-2,3,7,8-TCDF	83	24 - 169
13C-1,2,3,7,8-PeCDF	72	24 - 185
13C-2,3,4,7,8-PeCDF	71	21 - 178
13C-1,2,3,6,7,8-HxCDF	79	26 - 123
13C-2,3,4,6,7,8-HxCDF	89	28 - 136
13C-1,2,3,7,8,9-HxCDF	99	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	103	28 - 143
13C-1,2,3,4,7,8,9-HpCDF	90	26 - 138
13C-1,2,3,4,7,8-HxCDF	73	26 - 152

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-4 0.5-1.0

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	91	35 - 197

Notes:

TEF values are cited in U.S. Environmental Protection Agency, (1989) Interim procedures for estimating risks associated with exposures to mixtures of chlorinated dibenzo-p-dioxins and -dibenzofurans (CDDs and CDFs) and 1989 update. U.S. Environmental Protection Agency, Risk Assessment forum, Washington, DC; EPA/625/3-89/016

J Estimated result. Result is less than the reporting limit.

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-4 0.5-1.0

Lot-Sample #...:	G8E220367 - 002	**Work Order #...:**	KNQDG1AC	**Matrix....:**	SOLID
Date Sampled...:	05/20/08	**Date Received..:**	05/22/08	**Instrument:**	5D5
Prep Date.....:	06/09/08	**Analysis Date..:**	06/22/08	**Units.....:**	pg/g
Prep Batch #...:	8161259	**Dilution Factor:**	1	**% Moisture:**	16

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	ND		0.36	1.0	0.18
Total TCDD	ND		0.36		
1,2,3,7,8-PeCDD	ND		0.78	0.50	0.20
Total PeCDD	ND		0.78		
1,2,3,4,7,8-HxCDD	ND		0.43	0.10	0.021
1,2,3,6,7,8-HxCDD	ND		0.38	0.10	0.019
1,2,3,7,8,9-HxCDD	ND		0.38	0.10	0.019
Total HxCDD	ND		0.43		
1,2,3,4,6,7,8-HpCDD	ND		0.94	0.010	0.0047
Total HpCDD	ND		0.94		
OCDD	**6.5**	**J**		**0.0010**	**0.0065**
2,3,7,8-TCDF	ND		0.33	0.10	0.017
Total TCDF	ND		0.33		
1,2,3,7,8-PeCDF	ND		0.39	0.050	0.0097
2,3,4,7,8-PeCDF	ND		0.47	0.50	0.12
Total PeCDF	ND		0.47		
1,2,3,4,7,8-HxCDF	ND		0.37	0.10	0.019
1,2,3,6,7,8-HxCDF	ND		0.36	0.10	0.018
2,3,4,6,7,8-HxCDF	ND		0.29	0.10	0.014
1,2,3,7,8,9-HxCDF	ND		0.31	0.10	0.016
Total HxCDF	ND		0.37		
1,2,3,4,6,7,8-HpCDF	ND		0.60	0.010	0.0030
1,2,3,4,7,8,9-HpCDF	ND		0.62	0.010	0.0031
Total HpCDF	ND		0.62		
OCDF	ND		1.8	0.0010	0.00090
Total TEQ Concentration					0.67

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	85	25 - 164
13C-1,2,3,7,8-PeCDD	64	25 - 181
13C-1,2,3,4,7,8-HxCDD	82	32 - 141
13C-1,2,3,6,7,8-HxCDD	87	28 - 130
13C-1,2,3,4,6,7,8-HpCDD	78	23 - 140
13C-OCDD	42	17 - 157
13C-2,3,7,8-TCDF	83	24 - 169
13C-1,2,3,7,8-PeCDF	72	24 - 185
13C-2,3,4,7,8-PeCDF	71	21 - 178
13C-1,2,3,6,7,8-HxCDF	79	26 - 123
13C-2,3,4,6,7,8-HxCDF	89	28 - 136
13C-1,2,3,7,8,9-HxCDF	99	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	103	28 - 143
13C-1,2,3,4,7,8,9-HpCDF	90	26 - 138
13C-1,2,3,4,7,8-HxCDF	73	26 - 152

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-4 0.5-1.0

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	91	35 - 197

Notes:

ND TEQ Conc. = (EDL/2) * TEF Factor

TEF values used are cited in U.S. Environmental Protection Agency. (1989) Interim procedures for estimating risks associated with exposures to mixtures of chlorinated dibenzo-p-dioxins and -dibenzofurans (CDDs and CDFs) and 1989 update. U.S. Envrionmental Protection Agency, Risk Assessment forum, Washington, DC; EPA/625/3-89/016.

J Estimated result. Result is less than the reporting limit.

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-4 0.5-1.0

Lot-Sample #...:	G8E220367 - 002	**Work Order #...:**	KNQDG1AC	**Matrix....:**	SOLID
Date Sampled...:	05/20/08	**Date Received..:**	05/22/08	**Instrument:**	5D5
Prep Date.....:	06/09/08	**Analysis Date..:**	06/22/08	**Units.....:**	pg/g
Prep Batch #...:	8161259	**Dilution Factor:**	1	**% Moisture:**	16

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	ND		0.36	1	0
Total TCDD	ND		0.36		0
1,2,3,7,8-PeCDD	ND		0.78	1	0
Total PeCDD	ND		0.78		0
1,2,3,4,7,8-HxCDD	ND		0.43	0.1	0
1,2,3,6,7,8-HxCDD	ND		0.38	0.1	0
1,2,3,7,8,9-HxCDD	ND		0.38	0.1	0
Total HxCDD	ND		0.43		0
1,2,3,4,6,7,8-HpCDD	ND		0.94	0.01	0
Total HpCDD	ND		0.94		0
OCDD	**6.5**	**J**		**0.0003**	**0.002**
2,3,7,8-TCDF	ND		0.33	0.1	0
Total TCDF	ND		0.33		0
1,2,3,7,8-PeCDF	ND		0.39	0.03	0
2,3,4,7,8-PeCDF	ND		0.47	0.3	0
Total PeCDF	ND		0.47		0
1,2,3,4,7,8-HxCDF	ND		0.37	0.1	0
1,2,3,6,7,8-HxCDF	ND		0.36	0.1	0
2,3,4,6,7,8-HxCDF	ND		0.29	0.1	0
1,2,3,7,8,9-HxCDF	ND		0.31	0.1	0
Total HxCDF	ND		0.37		0
1,2,3,4,6,7,8-HpCDF	ND		0.60	0.01	0
1,2,3,4,7,8,9-HpCDF	ND		0.62	0.01	0
Total HpCDF	ND		0.62		0
OCDF	ND		1.8	0.0003	0
Total TEQ Concentration					**0.002**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	85	25 - 164
13C-1,2,3,7,8-PeCDD	64	25 - 181
13C-1,2,3,4,7,8-HxCDD	82	32 - 141
13C-1,2,3,6,7,8-HxCDD	87	28 - 130
13C-1,2,3,4,6,7,8-HpCDD	78	23 - 140
13C-OCDD	42	17 - 157
13C-2,3,7,8-TCDF	83	24 - 169
13C-1,2,3,7,8-PeCDF	72	24 - 185
13C-2,3,4,7,8-PeCDF	71	21 - 178
13C-1,2,3,6,7,8-HxCDF	79	26 - 123
13C-2,3,4,6,7,8-HxCDF	89	28 - 136
13C-1,2,3,7,8,9-HxCDF	99	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	103	28 - 143
13C-1,2,3,4,7,8,9-HpCDF	90	26 - 138
13C-1,2,3,4,7,8-HxCDF	73	26 - 152

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-4 0.5-1.0

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	91	35 - 197

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

J Estimated result. Result is less than the reporting limit.

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-4

Lot-Sample #...:	G8E220367 - 001	**Work Order #...:**	KNQDE1AA	**Matrix....:**	WATER
Date Sampled...:	05/20/08	**Date Received..:**	05/22/08	**Instrument:**	4D5
Prep Date.....:	06/02/08	**Analysis Date..:**	06/19/08	**Units.....:**	pg/L
Prep Batch #...:	8154481	**Dilution Factor:**	1	**% Moisture:**	

PARAMETER	RESULT	DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	ND	0.70	1.0	0.35
Total TCDD	ND	0.70		
1,2,3,7,8-PeCDD	ND	1.1	1.0	0.55
Total PeCDD	ND	1.1		
1,2,3,4,7,8-HxCDD	ND	0.52	0.10	0.026
1,2,3,6,7,8-HxCDD	ND	0.82	0.10	0.041
1,2,3,7,8,9-HxCDD	ND	0.46	0.10	0.023
Total HxCDD	ND	0.82		
1,2,3,4,6,7,8-HpCDD	ND	1.9	0.010	0.0095
Total HpCDD	ND	1.9		
OCDD	ND	9.4	0.00030	0.0014
2,3,7,8-TCDF	ND	0.35	0.10	0.018
Total TCDF	ND	0.47		
1,2,3,7,8-PeCDF	ND	0.30	0.030	0.0045
2,3,4,7,8-PeCDF	ND	0.34	0.30	0.051
Total PeCDF	ND	0.35		
1,2,3,4,7,8-HxCDF	ND	0.52	0.10	0.026
1,2,3,6,7,8-HxCDF	ND	0.45	0.10	0.022
2,3,4,6,7,8-HxCDF	ND	0.35	0.10	0.018
1,2,3,7,8,9-HxCDF	ND	0.45	0.10	0.022
Total HxCDF	ND	0.52		
1,2,3,4,6,7,8-HpCDF	ND	38	0.010	0.19
1,2,3,4,7,8,9-HpCDF	ND	51	0.010	0.25
Total HpCDF	ND	51		
OCDF	ND	4.3	0.00030	0.00065
Total TEQ Concentration				1.6

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	57	25 - 164
13C-1,2,3,7,8-PeCDD	51	25 - 181
13C-1,2,3,4,7,8-HxCDD	47	32 - 141
13C-1,2,3,6,7,8-HxCDD	49	28 - 130
13C-1,2,3,4,6,7,8-HpCDD	53	23 - 140
13C-OCDD	42	17 - 157
13C-2,3,7,8-TCDF	56	24 - 169
13C-1,2,3,7,8-PeCDF	52	24 - 185
13C-2,3,4,7,8-PeCDF	50	21 - 178
13C-1,2,3,6,7,8-HxCDF	49	26 - 123
13C-2,3,4,6,7,8-HxCDF	54	28 - 136
13C-1,2,3,7,8,9-HxCDF	50	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	49	28 - 143
13C-1,2,3,4,7,8,9-HpCDF	48	26 - 138
13C-1,2,3,4,7,8-HxCDF	46	26 - 152

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	98	35 - 197

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-4

Notes:

ND TEQ Conc. = (EDL/2) * TEF Factor

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-7 0.0-0.5

Lot-Sample #...:	G8E220367 - 003	**Work Order #...:**	KNQDH1AC	**Matrix....:**	SOLID
Date Sampled...:	05/20/08	**Date Received..:**	05/22/08	**Instrument:**	5D5
Prep Date.....:	06/09/08	**Analysis Date..:**	06/22/08	**Units.....:**	pg/g
Prep Batch #...:	8161259	**Dilution Factor:**	1	**% Moisture:**	7.3

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	ND		0.30	1.000	0
Total TCDD	**0.53**				
1,2,3,7,8-PeCDD	ND		1.3	0.500	0
Total PeCDD	ND		1.4		0
1,2,3,4,7,8-HxCDD	ND		1.3	0.100	0
1,2,3,6,7,8-HxCDD	**5.7**			**0.100**	**0.5700**
1,2,3,7,8,9-HxCDD	**3.3**	**J JA**		**0.100**	**0.3300**
Total HxCDD	**27**				
1,2,3,4,6,7,8-HpCDD	**82**			**0.010**	**0.8200**
Total HpCDD	**170**				
OCDD	**550**			**0.001**	**0.5500**
2,3,7,8-TCDF	**0.53**	**J CON**		**0.100**	**0.0530**
Total TCDF	**4.2**				
1,2,3,7,8-PeCDF	ND		0.46	0.050	0
2,3,4,7,8-PeCDF	ND		0.55	0.500	0
Total PeCDF	**7.2**				
1,2,3,4,7,8-HxCDF	ND		1.3	0.100	0
1,2,3,6,7,8-HxCDF	ND		1.2	0.100	0
2,3,4,6,7,8-HxCDF	ND		0.90	0.100	0
1,2,3,7,8,9-HxCDF	ND		0.37	0.100	0
Total HxCDF	**25**				
1,2,3,4,6,7,8-HpCDF	**28**			**0.010**	**0.2800**
1,2,3,4,7,8,9-HpCDF	ND		0.91	0.010	0
Total HpCDF	**67**				
OCDF	**34**			**0.001**	**0.0340**
Total TEQ Concentration					**2.6370**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	90	25 - 164
13C-1,2,3,7,8-PeCDD	71	25 - 181
13C-1,2,3,4,7,8-HxCDD	82	32 - 141
13C-1,2,3,6,7,8-HxCDD	91	28 - 130
13C-1,2,3,4,6,7,8-HpCDD	84	23 - 140
13C-OCDD	48	17 - 157
13C-2,3,7,8-TCDF	92	24 - 169
13C-1,2,3,7,8-PeCDF	80	24 - 185
13C-2,3,4,7,8-PeCDF	80	21 - 178
13C-1,2,3,6,7,8-HxCDF	79	26 - 123
13C-2,3,4,6,7,8-HxCDF	93	28 - 136
13C-1,2,3,7,8,9-HxCDF	101	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	115	28 - 143
13C-1,2,3,4,7,8,9-HpCDF	90	26 - 138
13C-1,2,3,4,7,8-HxCDF	74	26 - 152

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-7 0.0-0.5

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	93	35 - 197

Notes:

TEF values are cited in U.S. Environmental Protection Agency, (1989) Interim procedures for estimating risks associated with exposures to mixtures of chlorinated dibenzo-p-dioxins and -dibenzofurans (CDDs and CDFs) and 1989 update. U.S. Environmental Protection Agency, Risk Assessment forum, Washington, DC; EPA/625/3-89/016

CON	Confirmation analysis.
J	Estimated result. Result is less than the reporting limit.
JA	The analyte was positively identified, but the quantitation is an estimate.

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-7 0.0-0.5

Lot-Sample #...:	G8E220367 - 003	**Work Order #...:**	KNQDH1AC	**Matrix.....:**	SOLID
Date Sampled...:	05/20/08	**Date Received..:**	05/22/08	**Instrument:**	5D5
Prep Date.....:	06/09/08	**Analysis Date..:**	06/22/08	**Units.....:**	pg/g
Prep Batch #...:	8161259	**Dilution Factor:**	1	**% Moisture:**	7.3

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	ND		0.30	1.0	0.15
Total TCDD	**0.53**				
1,2,3,7,8-PeCDD	ND		1.3	0.50	0.33
Total PeCDD	ND		1.4		
1,2,3,4,7,8-HxCDD	ND		1.3	0.10	0.065
1,2,3,6,7,8-HxCDD	**5.7**			**0.10**	**0.57**
1,2,3,7,8,9-HxCDD	**3.3**	**J JA**		**0.10**	**0.33**
Total HxCDD	**27**				
1,2,3,4,6,7,8-HpCDD	**82**			**0.010**	**0.82**
Total HpCDD	**170**				
OCDD	**550**			**0.0010**	**0.55**
2,3,7,8-TCDF	**0.53**	**J CON**		**0.10**	**0.053**
Total TCDF	**4.2**				
1,2,3,7,8-PeCDF	ND		0.46	0.050	0.011
2,3,4,7,8-PeCDF	ND		0.55	0.50	0.14
Total PeCDF	**7.2**				
1,2,3,4,7,8-HxCDF	ND		1.3	0.10	0.065
1,2,3,6,7,8-HxCDF	ND		1.2	0.10	0.060
2,3,4,6,7,8-HxCDF	ND		0.90	0.10	0.045
1,2,3,7,8,9-HxCDF	ND		0.37	0.10	0.019
Total HxCDF	**25**				
1,2,3,4,6,7,8-HpCDF	**28**			**0.010**	**0.28**
1,2,3,4,7,8,9-HpCDF	ND		0.91	0.010	0.0046
Total HpCDF	**67**				
OCDF	**34**			**0.0010**	**0.034**
Total TEQ Concentration					3.5

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	90	25 - 164
13C-1,2,3,7,8-PeCDD	71	25 - 181
13C-1,2,3,4,7,8-HxCDD	82	32 - 141
13C-1,2,3,6,7,8-HxCDD	91	28 - 130
13C-1,2,3,4,6,7,8-HpCDD	84	23 - 140
13C-OCDD	48	17 - 157
13C-2,3,7,8-TCDF	92	24 - 169
13C-1,2,3,7,8-PeCDF	80	24 - 185
13C-2,3,4,7,8-PeCDF	80	21 - 178
13C-1,2,3,6,7,8-HxCDF	79	26 - 123
13C-2,3,4,6,7,8-HxCDF	93	28 - 136
13C-1,2,3,7,8,9-HxCDF	101	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	115	28 - 143
13C-1,2,3,4,7,8,9-HpCDF	90	26 - 138
13C-1,2,3,4,7,8-HxCDF	74	26 - 152

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-7 0.0-0.5

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	93	35 - 197

Notes:

ND TEQ Conc. = (EDL/2) * TEF Factor

TEF values used are cited in U.S. Environmental Protection Agency. (1989) Interim procedures for estimating risks associated with exposures to mixtures of chlorinated dibenzo-p-dioxins and -dibenzofurans (CDDs and CDFs) and 1989 update. U.S. Envrionmental Protection Agency, Risk Assessment forum, Washington, DC; EPA/625/3-89/016.

CON	Confirmation analysis.
J	Estimated result. Result is less than the reporting limit.
JA	The analyte was positively identified, but the quantitation is an estimate.

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-7 0.0-0.5

Lot-Sample #...:	G8E220367 - 003	**Work Order #...:**	KNQDH1AC	**Matrix....:**	SOLID
Date Sampled...:	05/20/08	**Date Received..:**	05/22/08	**Instrument:**	5D5
Prep Date.....:	06/09/08	**Analysis Date..:**	06/22/08	**Units.....:**	pg/g
Prep Batch #...:	8161259	**Dilution Factor:**	1	**% Moisture:**	7.3

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	ND		0.30	1	0
Total TCDD	**0.53**				
1,2,3,7,8-PeCDD	ND		1.3	1	0
Total PeCDD	ND		1.4		0
1,2,3,4,7,8-HxCDD	ND		1.3	0.1	0
1,2,3,6,7,8-HxCDD	**5.7**			**0.1**	**0.570**
1,2,3,7,8,9-HxCDD	**3.3**	**J JA**		**0.1**	**0.330**
Total HxCDD	**27**				
1,2,3,4,6,7,8-HpCDD	**82**			**0.01**	**0.820**
Total HpCDD	**170**				
OCDD	**550**			**0.0003**	**0.170**
2,3,7,8-TCDF	**0.53**	**J CON**		**0.1**	**0.053**
Total TCDF	**4.2**				
1,2,3,7,8-PeCDF	ND		0.46	0.03	0
2,3,4,7,8-PeCDF	ND		0.55	0.3	0
Total PeCDF	**7.2**				
1,2,3,4,7,8-HxCDF	ND		1.3	0.1	0
1,2,3,6,7,8-HxCDF	ND		1.2	0.1	0
2,3,4,6,7,8-HxCDF	ND		0.90	0.1	0
1,2,3,7,8,9-HxCDF	ND		0.37	0.1	0
Total HxCDF	**25**				
1,2,3,4,6,7,8-HpCDF	**28**			**0.01**	**0.280**
1,2,3,4,7,8,9-HpCDF	ND		0.91	0.01	0
Total HpCDF	**67**				
OCDF	**34**			**0.0003**	**0.010**
Total TEQ Concentration					**2.233**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	90	25 - 164
13C-1,2,3,7,8-PeCDD	71	25 - 181
13C-1,2,3,4,7,8-HxCDD	82	32 - 141
13C-1,2,3,6,7,8-HxCDD	91	28 - 130
13C-1,2,3,4,6,7,8-HpCDD	84	23 - 140
13C-OCDD	48	17 - 157
13C-2,3,7,8-TCDF	92	24 - 169
13C-1,2,3,7,8-PeCDF	80	24 - 185
13C-2,3,4,7,8-PeCDF	80	21 - 178
13C-1,2,3,6,7,8-HxCDF	79	26 - 123
13C-2,3,4,6,7,8-HxCDF	93	28 - 136
13C-1,2,3,7,8,9-HxCDF	101	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	115	28 - 143
13C-1,2,3,4,7,8,9-HpCDF	90	26 - 138
13C-1,2,3,4,7,8-HxCDF	74	26 - 152

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-7 0.0-0.5

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	93	35 - 197

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

CON	Confirmation analysis.
J	Estimated result. Result is less than the reporting limit.
JA	The analyte was positively identified, but the quantitation is an estimate.

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-4 0.5-1.0

Lot-Sample #...:	G8E220367 - 002	**Work Order #...:**	KNQDG1AC	**Matrix.....:**	SOLID
Date Sampled...:	05/20/08	**Date Received..:**	05/22/08	**Instrument:**	5D5
Prep Date.....:	06/09/08	**Analysis Date..:**	06/22/08	**Units.....:**	pg/g
Prep Batch #...:	8161259	**Dilution Factor:**	1	**% Moisture:**	16

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	ND		0.36	1.0	0.18
Total TCDD	ND		0.36		
1,2,3,7,8-PeCDD	ND		0.78	1.0	0.39
Total PeCDD	ND		0.78		
1,2,3,4,7,8-HxCDD	ND		0.43	0.10	0.021
1,2,3,6,7,8-HxCDD	ND		0.38	0.10	0.019
1,2,3,7,8,9-HxCDD	ND		0.38	0.10	0.019
Total HxCDD	ND		0.43		
1,2,3,4,6,7,8-HpCDD	ND		0.94	0.010	0.0047
Total HpCDD	ND		0.94		
OCDD	**6.5**	**J**		**0.00030**	**0.0020**
2,3,7,8-TCDF	ND		0.33	0.10	0.017
Total TCDF	ND		0.33		
1,2,3,7,8-PeCDF	ND		0.39	0.030	0.0058
2,3,4,7,8-PeCDF	ND		0.47	0.30	0.070
Total PeCDF	ND		0.47		
1,2,3,4,7,8-HxCDF	ND		0.37	0.10	0.019
1,2,3,6,7,8-HxCDF	ND		0.36	0.10	0.018
2,3,4,6,7,8-HxCDF	ND		0.29	0.10	0.014
1,2,3,7,8,9-HxCDF	ND		0.31	0.10	0.016
Total HxCDF	ND		0.37		
1,2,3,4,6,7,8-HpCDF	ND		0.60	0.010	0.0030
1,2,3,4,7,8,9-HpCDF	ND		0.62	0.010	0.0031
Total HpCDF	ND		0.62		
OCDF	ND		1.8	0.00030	0.00027
Total TEQ Concentration					0.80

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	85	25 - 164
13C-1,2,3,7,8-PeCDD	64	25 - 181
13C-1,2,3,4,7,8-HxCDD	82	32 - 141
13C-1,2,3,6,7,8-HxCDD	87	28 - 130
13C-1,2,3,4,6,7,8-HpCDD	78	23 - 140
13C-OCDD	42	17 - 157
13C-2,3,7,8-TCDF	83	24 - 169
13C-1,2,3,7,8-PeCDF	72	24 - 185
13C-2,3,4,7,8-PeCDF	71	21 - 178
13C-1,2,3,6,7,8-HxCDF	79	26 - 123
13C-2,3,4,6,7,8-HxCDF	89	28 - 136
13C-1,2,3,7,8,9-HxCDF	99	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	103	28 - 143
13C-1,2,3,4,7,8,9-HpCDF	90	26 - 138
13C-1,2,3,4,7,8-HxCDF	73	26 - 152

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	91	35 - 197

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-4 0.5-1.0

Notes:

ND TEQ Conc. = (EDL/2) * TEF Factor

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

J	The analyte was positively identified. The quantitation is an estimation.

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-8 0.0-0.5

Lot-Sample #...:	G8E220367 - 004	**Work Order #...:**	KNQDK1AC	**Matrix.....:**	SOLID
Date Sampled...:	05/20/08	**Date Received..:**	05/22/08	**Instrument:**	5D5
Prep Date.....:	06/09/08	**Analysis Date..:**	06/22/08	**Units.....:**	pg/g
Prep Batch #...:	8161259	**Dilution Factor:**	1	**% Moisture:**	9.0

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	ND		0.40	1.000	0
Total TCDD	ND		0.64		0
1,2,3,7,8-PeCDD	ND		1.2	0.500	0
Total PeCDD	ND		1.2		0
1,2,3,4,7,8-HxCDD	ND		1.5	0.100	0
1,2,3,6,7,8-HxCDD	**3.2**	**J**		**0.100**	**0.3200**
1,2,3,7,8,9-HxCDD	**3.3**	**J**		**0.100**	**0.3300**
Total HxCDD	**25**				
1,2,3,4,6,7,8-HpCDD	**44**			**0.010**	**0.4400**
Total HpCDD	**89**				
OCDD	**270**			**0.001**	**0.2700**
2,3,7,8-TCDF	ND	CON	0.46	0.100	0
Total TCDF	**1.4**				
1,2,3,7,8-PeCDF	ND		0.52	0.050	0
2,3,4,7,8-PeCDF	ND		0.64	0.500	0
Total PeCDF	ND		2.0		0
1,2,3,4,7,8-HxCDF	ND		0.75	0.100	0
1,2,3,6,7,8-HxCDF	ND		0.80	0.100	0
2,3,4,6,7,8-HxCDF	ND		0.92	0.100	0
1,2,3,7,8,9-HxCDF	ND		0.67	0.100	0
Total HxCDF	**15**				
1,2,3,4,6,7,8-HpCDF	**16**			**0.010**	**0.1600**
1,2,3,4,7,8,9-HpCDF	ND		1.7	0.010	0
Total HpCDF	**38**				
OCDF	**18**			**0.001**	**0.0180**
Total TEQ Concentration					**1.5380**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	92	25 - 164
13C-1,2,3,7,8-PeCDD	78	25 - 181
13C-1,2,3,4,7,8-HxCDD	94	32 - 141
13C-1,2,3,6,7,8-HxCDD	97	28 - 130
13C-1,2,3,4,6,7,8-HpCDD	77	23 - 140
13C-OCDD	54	17 - 157
13C-2,3,7,8-TCDF	90	24 - 169
13C-1,2,3,7,8-PeCDF	86	24 - 185
13C-2,3,4,7,8-PeCDF	83	21 - 178
13C-1,2,3,6,7,8-HxCDF	95	26 - 123
13C-2,3,4,6,7,8-HxCDF	91	28 - 136
13C-1,2,3,7,8,9-HxCDF	93	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	92	28 - 143
13C-1,2,3,4,7,8,9-HpCDF	76	26 - 138
13C-1,2,3,4,7,8-HxCDF	91	26 - 152

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-8 0.0-0.5

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	94	35 - 197

Notes:

TEF values are cited in U.S. Environmental Protection Agency, (1989) Interim procedures for estimating risks associated with exposures to mixtures of chlorinated dibenzo-p-dioxins and -dibenzofurans (CDDs and CDFs) and 1989 update. U.S. Environmental Protection Agency, Risk Assessment forum, Washington, DC; EPA/625/3-89/016

CON	Confirmation analysis.
J	Estimated result. Result is less than the reporting limit.

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-8 0.0-0.5

Lot-Sample #...:	G8E220367 - 004	**Work Order #...:**	KNQDK1AC	**Matrix.....:**	SOLID
Date Sampled...:	05/20/08	**Date Received..:**	05/22/08	**Instrument:**	5D5
Prep Date.....:	06/09/08	**Analysis Date..:**	06/22/08	**Units.....:**	pg/g
Prep Batch #...:	8161259	**Dilution Factor:**	1	**% Moisture:**	9.0

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	ND		0.40	1.0	0.20
Total TCDD	ND		0.64		
1,2,3,7,8-PeCDD	ND		1.2	0.50	0.30
Total PeCDD	ND		1.2		
1,2,3,4,7,8-HxCDD	ND		1.5	0.10	0.075
1,2,3,6,7,8-HxCDD	**3.2**	**J**		**0.10**	**0.32**
1,2,3,7,8,9-HxCDD	**3.3**	**J**		**0.10**	**0.33**
Total HxCDD	**25**				
1,2,3,4,6,7,8-HpCDD	**44**			**0.010**	**0.44**
Total HpCDD	**89**				
OCDD	**270**			**0.0010**	**0.27**
2,3,7,8-TCDF	ND	CON	0.46	0.10	0.023
Total TCDF	**1.4**				
1,2,3,7,8-PeCDF	ND		0.52	0.050	0.013
2,3,4,7,8-PeCDF	ND		0.64	0.50	0.16
Total PeCDF	ND		2.0		
1,2,3,4,7,8-HxCDF	ND		0.75	0.10	0.037
1,2,3,6,7,8-HxCDF	ND		0.80	0.10	0.040
2,3,4,6,7,8-HxCDF	ND		0.92	0.10	0.046
1,2,3,7,8,9-HxCDF	ND		0.67	0.10	0.034
Total HxCDF	**15**				
1,2,3,4,6,7,8-HpCDF	**16**			**0.010**	**0.16**
1,2,3,4,7,8,9-HpCDF	ND		1.7	0.010	0.0085
Total HpCDF	**38**				
OCDF	**18**			**0.0010**	**0.018**
Total TEQ Concentration					2.5

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	92	25 - 164
13C-1,2,3,7,8-PeCDD	78	25 - 181
13C-1,2,3,4,7,8-HxCDD	94	32 - 141
13C-1,2,3,6,7,8-HxCDD	97	28 - 130
13C-1,2,3,4,6,7,8-HpCDD	77	23 - 140
13C-OCDD	54	17 - 157
13C-2,3,7,8-TCDF	90	24 - 169
13C-1,2,3,7,8-PeCDF	86	24 - 185
13C-2,3,4,7,8-PeCDF	83	21 - 178
13C-1,2,3,6,7,8-HxCDF	95	26 - 123
13C-2,3,4,6,7,8-HxCDF	91	28 - 136
13C-1,2,3,7,8,9-HxCDF	93	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	92	28 - 143
13C-1,2,3,4,7,8,9-HpCDF	76	26 - 138
13C-1,2,3,4,7,8-HxCDF	91	26 - 152

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-8 0.0-0.5

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	94	35 - 197

Notes:

ND TEQ Conc. = (EDL/2) * TEF Factor

TEF values used are cited in U.S. Environmental Protection Agency. (1989) Interim procedures for estimating risks associated with exposures to mixtures of chlorinated dibenzo-p-dioxins and -dibenzofurans (CDDs and CDFs) and 1989 update. U.S. Envrionmental Protection Agency, Risk Assessment forum, Washington, DC; EPA/625/3-89/016.

CON	Confirmation analysis.
J	Estimated result. Result is less than the reporting limit.

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-8 0.0-0.5

Lot-Sample #...:	G8E220367 - 004	**Work Order #...:**	KNQDK1AC	**Matrix....:**	SOLID
Date Sampled...:	05/20/08	**Date Received..:**	05/22/08	**Instrument:**	5D5
Prep Date.....:	06/09/08	**Analysis Date..:**	06/22/08	**Units.....:**	pg/g
Prep Batch #...:	8161259	**Dilution Factor:**	1	**% Moisture:**	9.0

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	ND		0.40	1	0
Total TCDD	ND		0.64		0
1,2,3,7,8-PeCDD	ND		1.2	1	0
Total PeCDD	ND		1.2		0
1,2,3,4,7,8-HxCDD	ND		1.5	0.1	0
1,2,3,6,7,8-HxCDD	**3.2**	**J**		**0.1**	**0.320**
1,2,3,7,8,9-HxCDD	**3.3**	**J**		**0.1**	**0.330**
Total HxCDD	**25**				
1,2,3,4,6,7,8-HpCDD	**44**			**0.01**	**0.440**
Total HpCDD	**89**				
OCDD	**270**			**0.0003**	**0.081**
2,3,7,8-TCDF	ND	CON	0.46	0.1	0
Total TCDF	**1.4**				
1,2,3,7,8-PeCDF	ND		0.52	0.03	0
2,3,4,7,8-PeCDF	ND		0.64	0.3	0
Total PeCDF	ND		2.0		0
1,2,3,4,7,8-HxCDF	ND		0.75	0.1	0
1,2,3,6,7,8-HxCDF	ND		0.80	0.1	0
2,3,4,6,7,8-HxCDF	ND		0.92	0.1	0
1,2,3,7,8,9-HxCDF	ND		0.67	0.1	0
Total HxCDF	**15**				
1,2,3,4,6,7,8-HpCDF	**16**			**0.01**	**0.160**
1,2,3,4,7,8,9-HpCDF	ND		1.7	0.01	0
Total HpCDF	**38**				
OCDF	**18**			**0.0003**	**0.005**
Total TEQ Concentration					**1.336**

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	92	25 - 164
13C-1,2,3,7,8-PeCDD	78	25 - 181
13C-1,2,3,4,7,8-HxCDD	94	32 - 141
13C-1,2,3,6,7,8-HxCDD	97	28 - 130
13C-1,2,3,4,6,7,8-HpCDD	77	23 - 140
13C-OCDD	54	17 - 157
13C-2,3,7,8-TCDF	90	24 - 169
13C-1,2,3,7,8-PeCDF	86	24 - 185
13C-2,3,4,7,8-PeCDF	83	21 - 178
13C-1,2,3,6,7,8-HxCDF	95	26 - 123
13C-2,3,4,6,7,8-HxCDF	91	28 - 136
13C-1,2,3,7,8,9-HxCDF	93	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	92	28 - 143
13C-1,2,3,4,7,8,9-HpCDF	76	26 - 138
13C-1,2,3,4,7,8-HxCDF	91	26 - 152

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-8 0.0-0.5

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	94	35 - 197

Notes:

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

CON	Confirmation analysis.
J	Estimated result. Result is less than the reporting limit.

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-7 0.0-0.5

Lot-Sample #...:	G8E220367 - 003	**Work Order #...:**	KNQDH1AC	**Matrix.....:**	SOLID
Date Sampled...:	05/20/08	**Date Received..:**	05/22/08	**Instrument:**	5D5
Prep Date.....:	06/09/08	**Analysis Date..:**	06/22/08	**Units.....:**	pg/g
Prep Batch #...:	8161259	**Dilution Factor:**	1	**% Moisture:**	7.3

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	ND		0.30	1.0	0.15
Total TCDD	**0.53**				
1,2,3,7,8-PeCDD	ND		1.3	1.0	0.65
Total PeCDD	ND		1.4		
1,2,3,4,7,8-HxCDD	ND		1.3	0.10	0.065
1,2,3,6,7,8-HxCDD	**5.7**			**0.10**	**0.57**
1,2,3,7,8,9-HxCDD	**3.3**	**J JA**		**0.10**	**0.33**
Total HxCDD	**27**				
1,2,3,4,6,7,8-HpCDD	**82**			**0.010**	**0.82**
Total HpCDD	**170**				
OCDD	**550**			**0.00030**	**0.17**
2,3,7,8-TCDF	**0.53**	**J CON**		**0.10**	**0.053**
Total TCDF	**4.2**				
1,2,3,7,8-PeCDF	ND		0.46	0.030	0.0069
2,3,4,7,8-PeCDF	ND		0.55	0.30	0.083
Total PeCDF	**7.2**				
1,2,3,4,7,8-HxCDF	ND		1.3	0.10	0.065
1,2,3,6,7,8-HxCDF	ND		1.2	0.10	0.060
2,3,4,6,7,8-HxCDF	ND		0.90	0.10	0.045
1,2,3,7,8,9-HxCDF	ND		0.37	0.10	0.019
Total HxCDF	**25**				
1,2,3,4,6,7,8-HpCDF	**28**			**0.010**	**0.28**
1,2,3,4,7,8,9-HpCDF	ND		0.91	0.010	0.0046
Total HpCDF	**67**				
OCDF	**34**			**0.00030**	**0.010**
Total TEQ Concentration					3.4

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	90	25 - 164
13C-1,2,3,7,8-PeCDD	71	25 - 181
13C-1,2,3,4,7,8-HxCDD	82	32 - 141
13C-1,2,3,6,7,8-HxCDD	91	28 - 130
13C-1,2,3,4,6,7,8-HpCDD	84	23 - 140
13C-OCDD	48	17 - 157
13C-2,3,7,8-TCDF	92	24 - 169
13C-1,2,3,7,8-PeCDF	80	24 - 185
13C-2,3,4,7,8-PeCDF	80	21 - 178
13C-1,2,3,6,7,8-HxCDF	79	26 - 123
13C-2,3,4,6,7,8-HxCDF	93	28 - 136
13C-1,2,3,7,8,9-HxCDF	101	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	115	28 - 143
13C-1,2,3,4,7,8,9-HpCDF	90	26 - 138
13C-1,2,3,4,7,8-HxCDF	74	26 - 152

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	93	35 - 197

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-7 0.0-0.5

Notes:

ND TEQ Conc. = (EDL/2) * TEF Factor

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

CON	Confirmation analysis.
J	The analyte was positively identified. The quantitation is an estimation.
JA	The analyte was positively identified, but the quantitation is an estimate.

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-8 0.0-0.5

Lot-Sample #...:	G8E220367 - 004	**Work Order #...:**	KNQDK1AC	**Matrix....:**	SOLID
Date Sampled...:	05/20/08	**Date Received..:**	05/22/08	**Instrument:**	5D5
Prep Date.....:	06/09/08	**Analysis Date..:**	06/22/08	**Units.....:**	pg/g
Prep Batch #...:	8161259	**Dilution Factor:**	1	**% Moisture:**	9.0

PARAMETER	RESULT		DETECTION LIMIT	TEF FACTOR	TEQ CONCENTRATION
2,3,7,8-TCDD	ND		0.40	1.0	0.20
Total TCDD	ND		0.64		
1,2,3,7,8-PeCDD	ND		1.2	1.0	0.60
Total PeCDD	ND		1.2		
1,2,3,4,7,8-HxCDD	ND		1.5	0.10	0.075
1,2,3,6,7,8-HxCDD	**3.2**	**J**		**0.10**	**0.32**
1,2,3,7,8,9-HxCDD	**3.3**	**J**		**0.10**	**0.33**
Total HxCDD	**25**				
1,2,3,4,6,7,8-HpCDD	**44**			**0.010**	**0.44**
Total HpCDD	**89**				
OCDD	**270**			**0.00030**	**0.081**
2,3,7,8-TCDF	ND	CON	0.46	0.10	0.023
Total TCDF	**1.4**				
1,2,3,7,8-PeCDF	ND		0.52	0.030	0.0078
2,3,4,7,8-PeCDF	ND		0.64	0.30	0.096
Total PeCDF	ND		2.0		
1,2,3,4,7,8-HxCDF	ND		0.75	0.10	0.037
1,2,3,6,7,8-HxCDF	ND		0.80	0.10	0.040
2,3,4,6,7,8-HxCDF	ND		0.92	0.10	0.046
1,2,3,7,8,9-HxCDF	ND		0.67	0.10	0.034
Total HxCDF	**15**				
1,2,3,4,6,7,8-HpCDF	**16**			**0.010**	**0.16**
1,2,3,4,7,8,9-HpCDF	ND		1.7	0.010	0.0085
Total HpCDF	**38**				
OCDF	**18**			**0.00030**	**0.0054**
Total TEQ Concentration					2.5

INTERNAL STANDARDS	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	92	25 - 164
13C-1,2,3,7,8-PeCDD	78	25 - 181
13C-1,2,3,4,7,8-HxCDD	94	32 - 141
13C-1,2,3,6,7,8-HxCDD	97	28 - 130
13C-1,2,3,4,6,7,8-HpCDD	77	23 - 140
13C-OCDD	54	17 - 157
13C-2,3,7,8-TCDF	90	24 - 169
13C-1,2,3,7,8-PeCDF	86	24 - 185
13C-2,3,4,7,8-PeCDF	83	21 - 178
13C-1,2,3,6,7,8-HxCDF	95	26 - 123
13C-2,3,4,6,7,8-HxCDF	91	28 - 136
13C-1,2,3,7,8,9-HxCDF	93	29 - 147
13C-1,2,3,4,6,7,8-HpCDF	92	28 - 143
13C-1,2,3,4,7,8,9-HpCDF	76	26 - 138
13C-1,2,3,4,7,8-HxCDF	91	26 - 152

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	94	35 - 197

APPENDIX Q

Freshwater Environmental Services

Dioxins/Furans, HRGC/HRMS (1613B)

Client Sample ID: SB-8 0.0-0.5

Notes:

ND TEQ Conc. = (EDL/2) * TEF Factor

WHO TEFs for human risk assessment based on the conclusions of the World Health Organization meeting in Geneva, Switzerland, June 2005.

CON	Confirmation analysis.
J	The analyte was positively identified. The quantitation is an estimation.

APPENDIX Q

QC DATA ASSOCIATION SUMMARY

G8E220367

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	WATER	EPA-5 1613B		8154481	
002	SOLID	EPA-5 1613B		8161259	
	SOLID	ASTM D 2216-90		8154357	8154184
003	SOLID	EPA-5 1613B		8161259	
	SOLID	ASTM D 2216-90		8154357	8154184
004	SOLID	EPA-5 1613B		8161259	
	SOLID	ASTM D 2216-90		8154357	8154184

APPENDIX Q

METHOD BLANK REPORT

Trace Level Organic Compounds

Client Lot #...: G8E220367 **Work Order #...:** KPLA01AA **Matrix.....:** SOLID
MB Lot-Sample #: G8F090000-259

Prep Date.....: 06/09/08
Analysis Date..: 06/22/08 **Prep Batch #...:** 8161259
Dilution Factor: 1

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
2,3,7,8-TCDD	ND	0.60	pg/g	EPA-5 1613B
Total TCDD	ND	0.60	pg/g	EPA-5 1613B
1,2,3,7,8-PeCDD	ND	1.5	pg/g	EPA-5 1613B
Total PeCDD	ND	1.5	pg/g	EPA-5 1613B
1,2,3,4,7,8-HxCDD	ND	0.74	pg/g	EPA-5 1613B
1,2,3,6,7,8-HxCDD	ND	0.68	pg/g	EPA-5 1613B
1,2,3,7,8,9-HxCDD	ND	0.65	pg/g	EPA-5 1613B
Total HxCDD	ND	0.74	pg/g	EPA-5 1613B
1,2,3,4,6,7,8-HpCDD	ND	0.90	pg/g	EPA-5 1613B
Total HpCDD	ND	0.90	pg/g	EPA-5 1613B
OCDD	ND	4.4	pg/g	EPA-5 1613B
2,3,7,8-TCDF	ND	0.55	pg/g	EPA-5 1613B
Total TCDF	ND	0.55	pg/g	EPA-5 1613B
1,2,3,7,8-PeCDF	ND	0.79	pg/g	EPA-5 1613B
2,3,4,7,8-PeCDF	ND	0.94	pg/g	EPA-5 1613B
Total PeCDF	ND	0.94	pg/g	EPA-5 1613B
1,2,3,4,7,8-HxCDF	ND	0.62	pg/g	EPA-5 1613B
1,2,3,6,7,8-HxCDF	ND	0.60	pg/g	EPA-5 1613B
2,3,4,6,7,8-HxCDF	ND	0.47	pg/g	EPA-5 1613B
1,2,3,7,8,9-HxCDF	ND	0.53	pg/g	EPA-5 1613B
Total HxCDF	ND	0.62	pg/g	EPA-5 1613B
1,2,3,4,6,7,8-HpCDF	ND	0.73	pg/g	EPA-5 1613B
1,2,3,4,7,8,9-HpCDF	ND	1.2	pg/g	EPA-5 1613B
Total HpCDF	ND	1.2	pg/g	EPA-5 1613B
OCDF	ND	2.6	pg/g	EPA-5 1613B

(Continued on next page)

APPENDIX Q

METHOD BLANK REPORT

Trace Level Organic Compounds

Client Lot #...: G8E220367 **Work Order #...:** KPLA01AA **Matrix.....:** SOLID

PARAMETER	RESULT	DETECTION LIMIT	UNITS	METHOD
	PERCENT RECOVERY	RECOVERY LIMITS		
INTERNAL STANDARDS				
13C-2,3,7,8-TCDD	43	(25 - 164)		
13C-1,2,3,7,8-PeCDD	33	(25 - 181)		
13C-1,2,3,4,7,8-HxCDD	38	(32 - 141)		
13C-1,2,3,6,7,8-HxCDD	40	(28 - 130)		
13C-1,2,3,4,6,7,8-HpCDD	39	(23 - 140)		
13C-OCDD	22	(17 - 157)		
13C-2,3,7,8-TCDF	42	(24 - 169)		
13C-1,2,3,7,8-PeCDF	37	(24 - 185)		
13C-2,3,4,7,8-PeCDF	36	(21 - 178)		
13C-1,2,3,6,7,8-HxCDF	37	(26 - 123)		
13C-2,3,4,6,7,8-HxCDF	43	(28 - 136)		
13C-1,2,3,7,8,9-HxCDF	45	(29 - 147)		
13C-1,2,3,4,6,7,8-HpCDF	52	(28 - 143)		
13C-1,2,3,4,7,8,9-HpCDF	40	(26 - 138)		
13C-1,2,3,4,7,8-HxCDF	35	(26 - 152)		
	PERCENT RECOVERY	RECOVERY LIMITS		
SURROGATE				
37Cl4-2,3,7,8-TCDD	87	(35 - 197)		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

APPENDIX Q

LABORATORY CONTROL SAMPLE DATA REPORT

Trace Level Organic Compounds

Client Lot #...: G8E220367 Work Order #...: KPLA01AC Matrix.....: SOLID
LCS Lot-Sample#: G8F090000-259
Prep Date.....: 06/09/08 Analysis Date..: 06/22/08
Prep Batch #...: 8161259
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
2,3,7,8-TCDD	20.0	20.5	pg/g	102	EPA-5 1613B
1,2,3,7,8-PeCDD	100	112	pg/g	112	EPA-5 1613B
1,2,3,4,7,8-HxCDD	100	116	pg/g	116	EPA-5 1613B
1,2,3,6,7,8-HxCDD	100	115	pg/g	115	EPA-5 1613B
1,2,3,7,8,9-HxCDD	100	118	pg/g	118	EPA-5 1613B
1,2,3,4,6,7,8-HpCDD	100	115	pg/g	115	EPA-5 1613B
OCDD	200	240	pg/g	120	EPA-5 1613B
2,3,7,8-TCDF	20.0	25.2	pg/g	126	EPA-5 1613B
1,2,3,7,8-PeCDF	100	108	pg/g	108	EPA-5 1613B
2,3,4,7,8-PeCDF	100	113	pg/g	113	EPA-5 1613B
1,2,3,4,7,8-HxCDF	100	108	pg/g	108	EPA-5 1613B
1,2,3,6,7,8-HxCDF	100	114	pg/g	114	EPA-5 1613B
2,3,4,6,7,8-HxCDF	100	114	pg/g	114	EPA-5 1613B
1,2,3,7,8,9-HxCDF	100	112	pg/g	112	EPA-5 1613B
1,2,3,4,6,7,8-HpCDF	100	119	pg/g	119	EPA-5 1613B
1,2,3,4,7,8,9-HpCDF	100	116	pg/g	116	EPA-5 1613B
OCDF	200	243	pg/g	122	EPA-5 1613B

(Continued on next page)

APPENDIX Q

LABORATORY CONTROL SAMPLE DATA REPORT

Trace Level Organic Compounds

Client Lot #...: G8E220367 **Work Order #...:** KPLA01AC **Matrix.....:** SOLID
LCS Lot-Sample#: G8F090000-259

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	94	(25 - 164)
13C-1,2,3,7,8-PeCDD	73	(25 - 181)
13C-1,2,3,4,7,8-HxCDD	88	(32 - 141)
13C-1,2,3,6,7,8-HxCDD	97	(28 - 130)
13C-1,2,3,4,6,7,8-HpCDD	89	(23 - 140)
13C-OCDD	53	(17 - 157)
13C-2,3,7,8-TCDF	93	(24 - 169)
13C-1,2,3,7,8-PeCDF	83	(24 - 185)
13C-2,3,4,7,8-PeCDF	78	(21 - 178)
13C-1,2,3,6,7,8-HxCDF	85	(26 - 123)
13C-2,3,4,6,7,8-HxCDF	97	(28 - 136)
13C-1,2,3,7,8,9-HxCDF	106	(29 - 147)
13C-1,2,3,4,6,7,8-HpCDF	118	(28 - 143)
13C-1,2,3,4,7,8,9-HpCDF	94	(26 - 138)
13C-1,2,3,4,7,8-HxCDF	83	(26 - 152)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	96	(35 - 197)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

APPENDIX Q

LABORATORY CONTROL SAMPLE EVALUATION REPORT

Trace Level Organic Compounds

Client Lot #...: G8E220367 Work Order #...: KPLA01AC Matrix.....: SOLID
LCS Lot-Sample#: G8F090000-259
Prep Date.....: 06/09/08 Analysis Date..: 06/22/08
Prep Batch #...: 8161259
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
2,3,7,8-TCDD	102	(67 - 158)	EPA-5 1613B
1,2,3,7,8-PeCDD	112	(70 - 142)	EPA-5 1613B
1,2,3,4,7,8-HxCDD	116	(70 - 164)	EPA-5 1613B
1,2,3,6,7,8-HxCDD	115	(76 - 134)	EPA-5 1613B
1,2,3,7,8,9-HxCDD	118	(64 - 162)	EPA-5 1613B
1,2,3,4,6,7,8-HpCDD	115	(70 - 140)	EPA-5 1613B
OCDD	120	(78 - 144)	EPA-5 1613B
2,3,7,8-TCDF	126	(75 - 158)	EPA-5 1613B
1,2,3,7,8-PeCDF	108	(80 - 134)	EPA-5 1613B
2,3,4,7,8-PeCDF	113	(68 - 160)	EPA-5 1613B
1,2,3,4,7,8-HxCDF	108	(72 - 134)	EPA-5 1613B
1,2,3,6,7,8-HxCDF	114	(84 - 130)	EPA-5 1613B
2,3,4,6,7,8-HxCDF	114	(70 - 156)	EPA-5 1613B
1,2,3,7,8,9-HxCDF	112	(78 - 130)	EPA-5 1613B
1,2,3,4,6,7,8-HpCDF	119	(82 - 122)	EPA-5 1613B
1,2,3,4,7,8,9-HpCDF	116	(78 - 138)	EPA-5 1613B
OCDF	122	(63 - 170)	EPA-5 1613B

(Continued on next page)

APPENDIX Q

LABORATORY CONTROL SAMPLE EVALUATION REPORT

Trace Level Organic Compounds

Client Lot #...: G8E220367 **Work Order #...:** KPLA01AC **Matrix.....:** SOLID
LCS Lot-Sample#: G8F090000-259

INTERNAL STANDARD	PERCENT RECOVERY	RECOVERY LIMITS
13C-2,3,7,8-TCDD	94	(25 - 164)
13C-1,2,3,7,8-PeCDD	73	(25 - 181)
13C-1,2,3,4,7,8-HxCDD	88	(32 - 141)
13C-1,2,3,6,7,8-HxCDD	97	(28 - 130)
13C-1,2,3,4,6,7,8-HpCDD	89	(23 - 140)
13C-OCDD	53	(17 - 157)
13C-2,3,7,8-TCDF	93	(24 - 169)
13C-1,2,3,7,8-PeCDF	83	(24 - 185)
13C-2,3,4,7,8-PeCDF	78	(21 - 178)
13C-1,2,3,6,7,8-HxCDF	85	(26 - 123)
13C-2,3,4,6,7,8-HxCDF	97	(28 - 136)
13C-1,2,3,7,8,9-HxCDF	106	(29 - 147)
13C-1,2,3,4,6,7,8-HpCDF	118	(28 - 143)
13C-1,2,3,4,7,8,9-HpCDF	94	(26 - 138)
13C-1,2,3,4,7,8-HxCDF	83	(26 - 152)

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
37Cl4-2,3,7,8-TCDD	96	(35 - 197)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

SOLID, D 2216-90, Percent Moisture

APPENDIX Q

Freshwater Environmental Services

Client Sample ID: SB-4 0.5-1.0

General Chemistry

Lot-Sample #...: G8E220367-002 Work Order #...: KNQDG Matrix.....: SOLID
Date Sampled...: 05/20/08 Date Received..: 05/22/08
% Moisture.....: 16

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	16.2		%	ASTM D 2216-90	06/02-06/03/08	8154357

Dilution Factor: 1

APPENDIX Q

Freshwater Environmental Services

Client Sample ID: SB-7 0.0-0.5

General Chemistry

Lot-Sample #...: G8E220367-003 Work Order #...: KNQDH Matrix.....: SOLID
Date Sampled...: 05/20/08 Date Received..: 05/22/08
% Moisture.....: 7.3

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	7.3		%	ASTM D 2216-90	06/02-06/03/08	8154357

Dilution Factor: 1

APPENDIX Q

Freshwater Environmental Services

Client Sample ID: SB-8 0.0-0.5

General Chemistry

Lot-Sample #...: G8E220367-004 Work Order #...: KNQDK Matrix.....: SOLID
Date Sampled...: 05/20/08 Date Received..: 05/22/08
% Moisture.....: 9.0

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture	9.0		%	ASTM D 2216-90	06/02-06/03/08	8154357

Dilution Factor: 1

APPENDIX Q

QC DATA ASSOCIATION SUMMARY

G8E220367

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	WATER	EPA-5 1613B		8154481	
002	SOLID	EPA-5 1613B		8161259	
	SOLID	ASTM D 2216-90		8154357	8154184
003	SOLID	EPA-5 1613B		8161259	
	SOLID	ASTM D 2216-90		8154357	8154184
004	SOLID	EPA-5 1613B		8161259	
	SOLID	ASTM D 2216-90		8154357	8154184

APPENDIX Q

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: G8E220367 **Work Order #...:** KN68G-SMP KN68G-DUP **Matrix.....:** SOLID

Date Sampled...: 05/29/08 **Date Received..:** 05/31/08

% Moisture.....: 15

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Percent Moisture						SD Lot-Sample #: G8E310184-001		
	15.5	15.3	%	0.94	(0-20)	ASTM D 2216-90	06/02-06/03/08	8154357

Dilution Factor: 1

APPENDIX C

Boring Logs

APPENDIX Q

Log of Boring - SB-4

Date Started: May 20, 2008	Date Completed: May 20, 2008

Depth (ft)	Description	USCS	Remarks
0	Ground Surface		
	Sand, fine to very fine, subrounded, some silt, some roots some fused sand, 10YR 3/2 (very dark grayish brown), dry.	SM	
	Same as above with no roots or fused sand.	SM	Sample **SB-4 0.5-1.0** (5-20-08 @ 0900)
1	Sand, fine to very fine, subrounded, some silt, 10YR 3/2 (very dark grayish brown), moist.	SM	Sample **SB-4 1.0-1.5** (5-20-08 @ 0915)
			Sample **SB-4 1.5-2.0** (5-20-08 @ 0930)
2			Sample **SB-4 2.0-2.5** (5-20-08 @ 0940)
			Sample **SB-4 2.5-3.0** (5-20-08 @ 0950)
3	Sand, fine to very fine, subrounded, some silt, 10YR 4/2 (dark grayish brown), moist.	SM	
4			
5			
6	Sand, fine to very fine, subrounded, very few fines, 10YR 4/2 (dark grayish brown), moist.	SP	
7			estimated water level, 5-20-08
	Some mottling.	SP	
8	Sand, very fine, subrounded, very few fines, 10YR 4/2 (dark grayish brown), wet.		Water Sample **SB-4** (5-20-08 @ 1300)
9	BOH ~ 8.7'		

Total Depth: ~ 8.7 feet
Well Completion: Boring plugged with 3/8" bentonite pellets.

SB-4

Freshwater Environmental Services

Former Eel River Sawmills

Date: 7-25-08 | By: SJT

Log of Boring - SB-5

Date Started: May 20, 2008	Date Completed: May 20, 2008

Depth (ft)	Description	USCS	Remarks
0	Ground Surface		
	Gravel, rounded, some very fine sand, some silt, some roots, 10YR 3/2 (very dark grayish brown), dry.	GM	Sample **SB-5 0.0-0.5** (5-20-08 @ 1230)
	Same as above with fewer roots.	GM	Sample **SB-5 0.5-1.0** (5-20-08 @ 1235)
1	Gravel, rounded, some metagraywacke cobbles, rounded to well-rounded, very few fines, 10YR 3/2 (very dark grayish brown), dry.	GP	
	BOH ~ 1.5’		
2			

Total Depth: ~ 1.5 feet
Well Completion: NA

SB-5

Freshwater Environmental Services

Former Eel River Sawmills

Date: 7-25-08 | By: SJT

Log of Boring - SB-6

Date Started: May 20, 2008	Date Completed: May 20, 2008

Depth (ft)	Description	USCS	Remarks
0	Ground Surface		
	Gravel, rounded, some very fine sand, some silt, some roots, 10YR 3/2 (very dark grayish brown), dry.	GM	Sample **SB-6 0.0-0.5** (5-20-08 @ 1244)
1	Gravel, rounded, some metagraywacke cobbles, rounded to well-rounded, very few fines, 10YR 3/2 (very dark grayish brown), dry.	GP	Sample **SB-6 0.5-1.0** (5-20-08 @ 1302)
2	BOH ~ 1.5’		

Total Depth: ~ 1.5 feet
Well Completion: NA

SB-6

Freshwater Environmental Services

Former Eel River Sawmills

Date: 7-25-08 | By: SJT

Log of Boring - SB-7

Date Started: May 20, 2008	Date Completed: May 20, 2008

Depth (ft)	Description	USCS	Remarks
0	Ground Surface		
	Gravel, rounded, some very fine sand, some silt, some roots, 10YR 3/2 (very dark grayish brown), dry.	GM	Sample **SB-7 0.0-0.5** (5-20-08 @ 1248)
1	Gravel, rounded, some metagraywacke cobbles, rounded to well-rounded, very few fines, 10YR 3/2 (very dark grayish brown), dry.	GP	Sample **SB-7 0.5-1.0** (5-20-08 @ 1312)
2	BOH ~ 1.5’		

Total Depth: ~ 1.5 feet
Well Completion: NA

SB-7

Freshwater Environmental Services

Former Eel River Sawmills

Date: 7-25-08 | By: SJT

Log of Boring - SB-8

Date Started: May 20, 2008	Date Completed: May 20, 2008

Depth (ft)	Description	USCS	Remarks
0	Ground Surface		
	Gravel, rounded, some very fine sand, some silt, some roots, 10YR 3/2 (very dark grayish brown), dry.	GP	Sample **SB-8 0.0-0.5** (5-20-08 @ 1252)
1	Silt, some very fine sand, some small woody debris, 10YR 2/2 (very dark brown), dry.	ML	Sample **SB-8 0.5-1.0** (5-20-08 @ 1257)
	BOH ~ 1.5’		
2			

Total Depth: ~ 1.5 feet
Well Completion: NA

SB-8

Freshwater Environmental Services

Former Eel River Sawmills

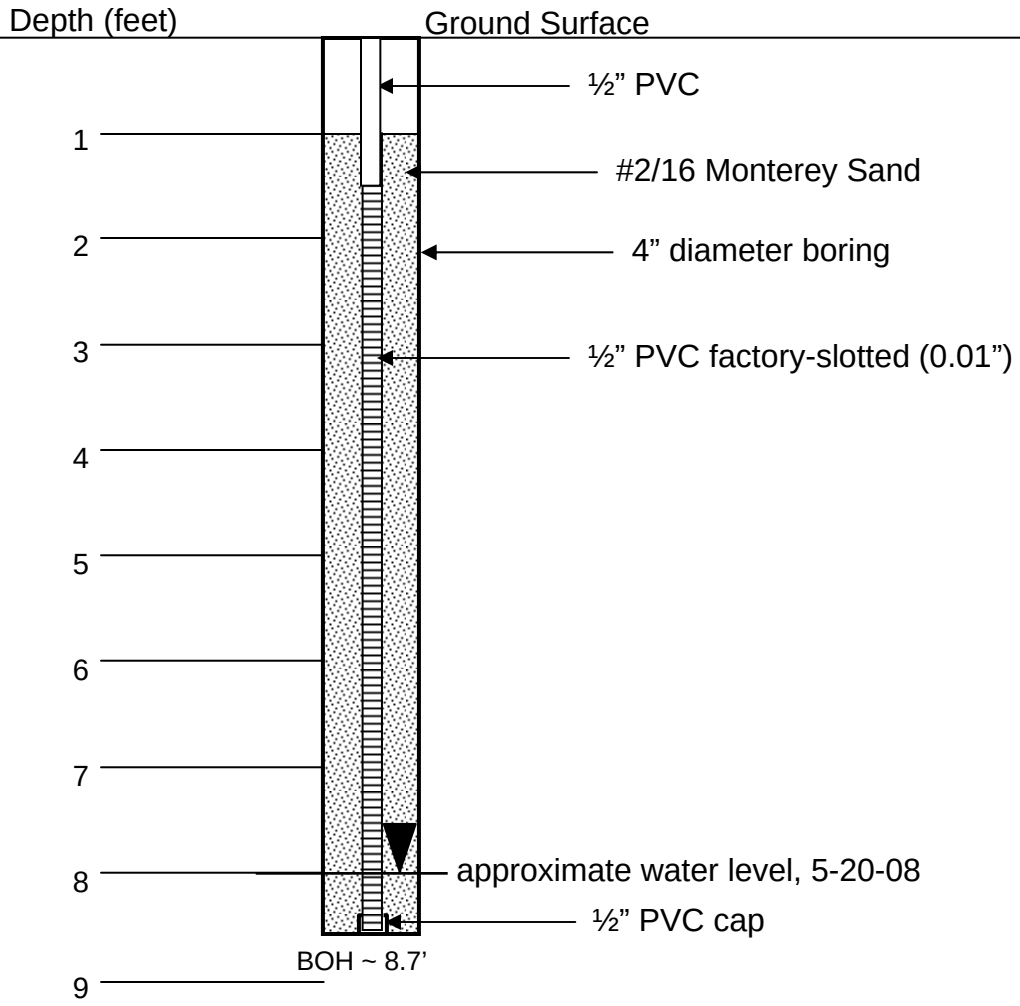
Date: 7-25-08 | By: SJT

APPENDIX D

Temporary Well Construction Diagram

Temporary Well/Soil Boring Details - SB-4

Date Started: May 20, 2008	Date Completed: May 20, 2008



Total Depth: ~ 8.7 feet
Well Completion: Boring plugged with 3/8" bentonite pellets.

SB-4

Freshwater Environmental Services

Former Eel River Sawmills

Date: 7-25-08 | By: SJT

APPENDIX R

Freshwater Environmental Services

October 9, 2008

California Regional Water Quality Control Board
North Coast Region
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

Attention : Ms. Kasey Ashley

Subject: Excavation of Dioxin-Containing Soils

File: **Former Eel River Sawmill Specialty Mill, 2000 Foster Avenue, Arcata, California**
Case Number 1NHU518

Dear Ms. Ashley:

This letter presents information regarding the excavation of dioxin-containing soils from the former Eel River Sawmill Specialty Mill located at 2000 Foster Avenue in Arcata, California, the Site. The Site location map is included as Figure 1 and the Site plan with the limits of the excavation is included in Figure 2.

The excavation of dioxin containing soils was conducted on September 12, 2008 as proposed in the Dioxin Assessment Report prepared by Freshwater Environmental Services (FES) dated August 7, 2008, (FES, 2008). The proposed excavation was approved in an email to Sean Armstrong of Foster Avenue, LLC. from the California Regional Water Quality Control Board, North Coast Region (RWQCB) dated September 02, 2008.

The excavation was conducted using a backhoe in the area delineated on figure 2. A hose with a spray nozzle was used for dust suppression. Soils from the edge of the delineated area were excavated to a depth of approximately 0.5 feet below ground level (BGL). The center of the delineated area was excavated to a depth of approximately 1.5 feet BGL and tapers towards the edge. Approximately 18 cubic yards of excavated soil was placed in a DOT-approved 20 cubic yard roll-top bin provided by NRC Environmental Services of Eureka, California. The excavated area was backfilled with river-run gravel obtained from a local gravel company.

The backhoe used for the excavation was decontaminated by washing with a laboratory grade detergent/water solution followed by a tap water rinse and a final distilled water rinse. Equipment rinse water was also placed in the bin. The bin was removed from the Site on the day of the excavation. Documentation of the removal and of disposal of the soil is attached. Documentation of the removal and of the previously generated investigation derived waste (IDW) from this Site is attached. Final documentation of disposal of the IDW will be forwarded upon receipt.

Should you have any questions about this letter please do not hesitate to contact the undersigned at 707 839-0091.

Sincerely,
Freshwater Environmental Services

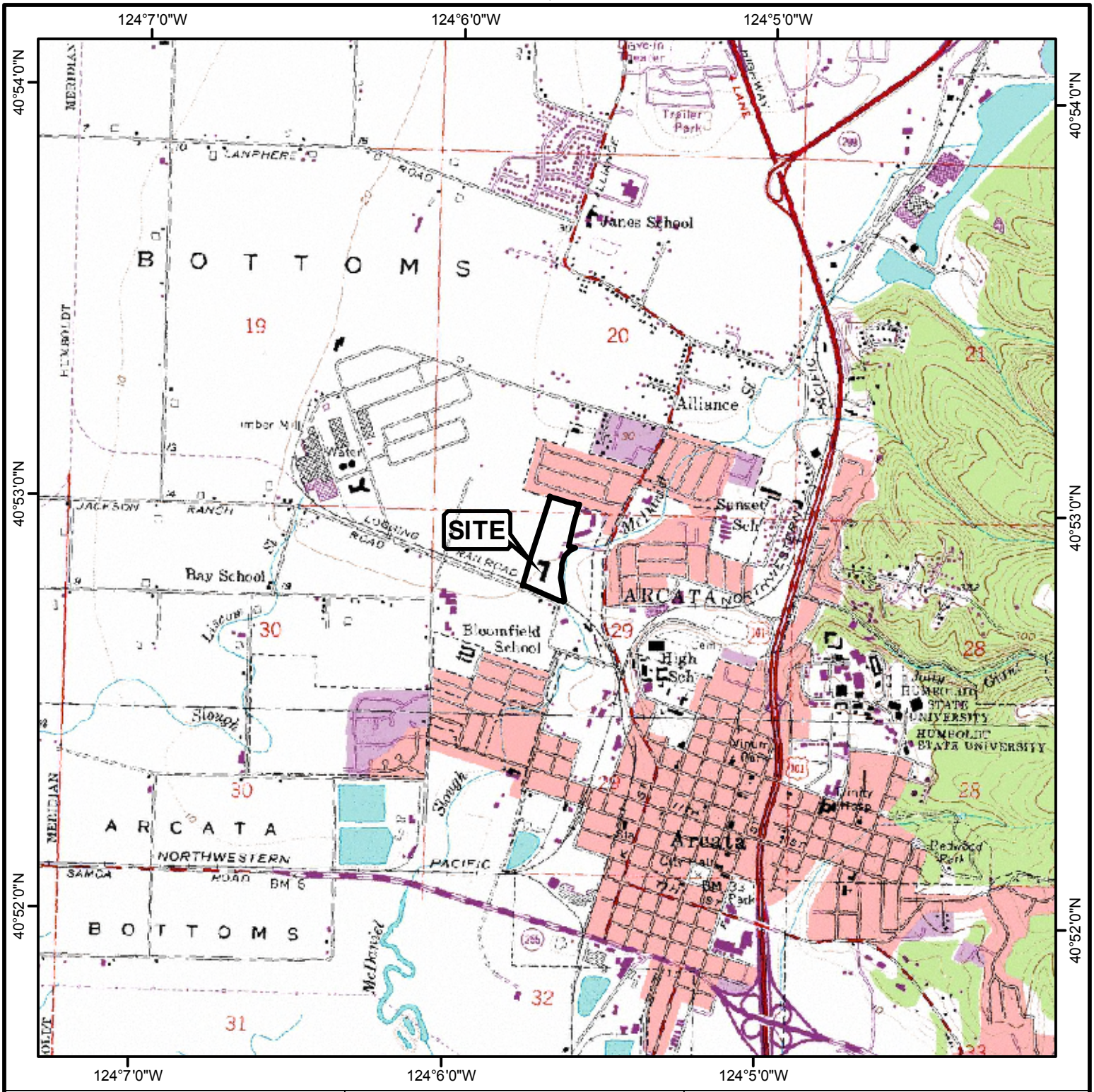
Stan Thiesen, P.G.
Geologist

Orrin Plocher
Geologist

Attachments: Figure 1 Site Location map
Figure 2 Site Plan
Figure 3 Excavation Area
Disposal Documentation

References:

Freshwater Environmental Services, *Dioxin Assessment Report, Former Eel River Sawmill Specialty Mill, 2000 Foster Avenue, Arcata, California*, August 7, 2008.



LEGEND

Base Image Data Source:
1:24,000 Digital Raster Graph Mosaic of Humboldt County, California

All Locations Approximate

Foster Ave. LLC

Figure 1
Site Location Map
2000 Foster Avenue
Arcata, California

Freshwater Environmental Services

Date: 9-23-08

By: SJT

N
W
E
S

Feet
0 50 100 200 300 400

LEGEND

Boring Location

Approximate Parcel Boundary

Base Image Data Source:
Obtained from City of Arcata,
Image date August 24, 2003.
All Locations Approximate

Foster Ave. LLC

Figure 2

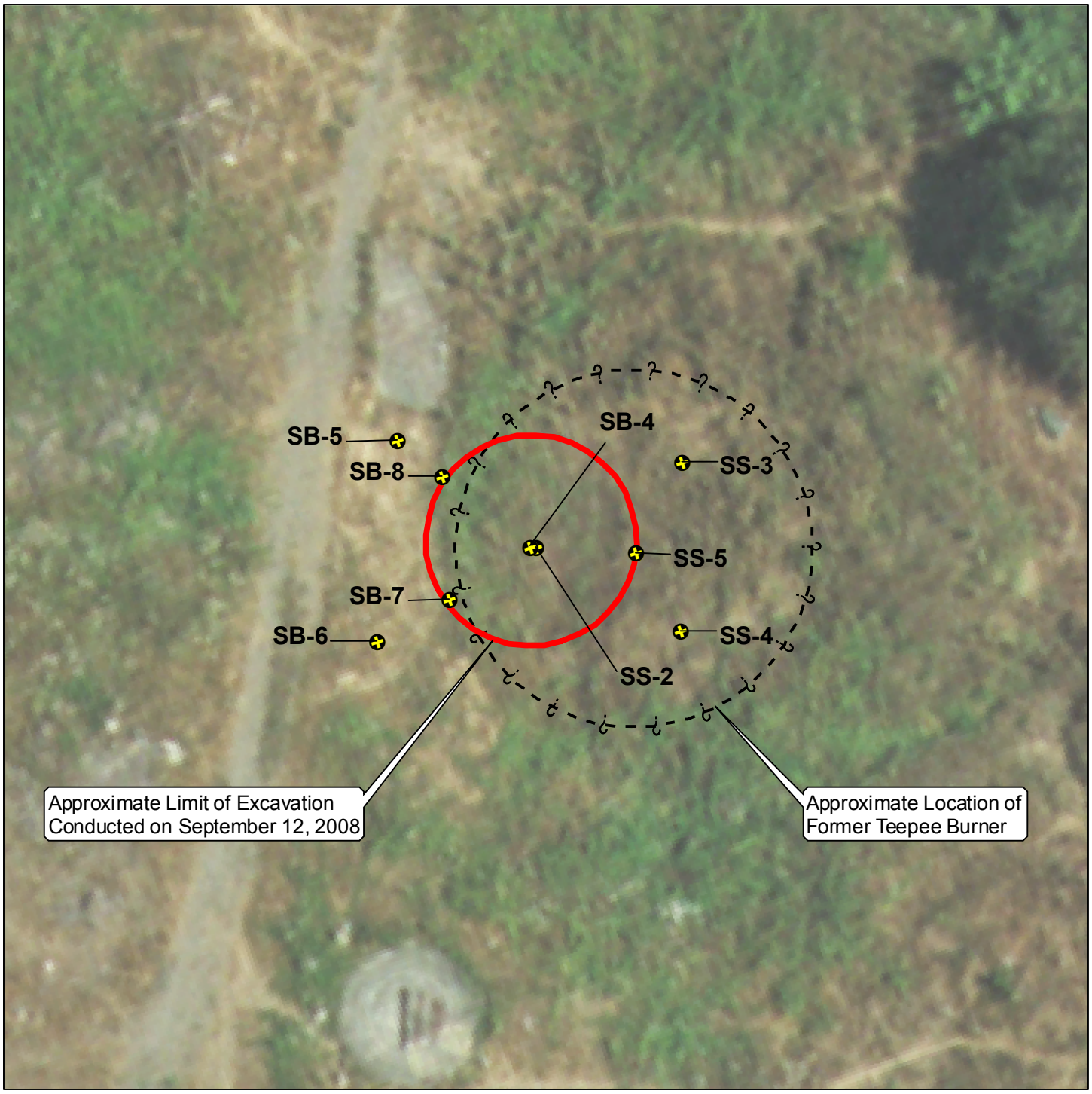
Site Plan

Freshwater Environmental Services

Date: 9-27-08

By: SJT

APPENDIX R



N
W
E
S

Feet
0 5 10 20 30 40

LEGEND

Boring Location

Base Image Data Source:
Obtained from City of Arcata,
Image date August 24, 2003.

All Locations Approximate

Foster Ave. LLC

Figure 3

Excavation Area

Freshwater Environmental Services

Date: 9-23-08

By: SJT

APPENDIX R

NON-HAZARDOUS WASTE MANIFEST	1. Generator ID Number	2. Page 1 of 1	3. Emergency Response Phone NRCES 510-7491390	4. Waste Tracking Number 37042

GENERATOR

5. Generator's Name and Mailing Address
FOSTER AVE. LLC
5251 ERICSON WAY
ARCATA, CA 95521
ATT: SEAN ARMSTRONG
Generator's Phone: 707-822-9000

Generator's Site Address (if different than mailing address)
FOSTER AVE. LLC
2000 FOSTER AVE
ARCATA, CA 95521

6. Transporter 1 Company Name: NRC ENVIRONMENTAL SERVICES INC — U.S. EPA ID Number: CAR000030114

7. Transporter 2 Company Name — U.S. EPA ID Number:

8. Designated Facility Name and Site Address
POTRERO HILLS LANDFILL (REPUBLIC)
3675 POTRERO HILL LANE
FAIRFIELD, CA 94686
Facility's Phone: 707-429-9600
U.S. EPA ID Number:

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.
	1. NON-HAZARDOUS WASTE SOLID (SOIL CUTTINGS)	001	CM	015	Y
	2.				
	3.				
	4.				

13. Special Handling Instructions and Additional Information
USE PROPER PPE WHEN HANDLING
Job / PO # 37042
PROFILE #1004428 BIN #3342

14. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Generator's/Offeror's Printed/Typed Name: [signature] as agent — Signature: Bill Earls — Month 9 Day 12 Year 08

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: JAMES D Mills — Signature: James D Mills — Month 10 Day 06 Year 08

Transporter 2 Printed/Typed Name — Signature — Month Day Year

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

17c. Signature of Alternate Facility (or Generator) — Month Day Year

18. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 17a

Printed/Typed Name — Signature — Month Day Year

APPENDIX R

REPUBLIC SERVICES, INC.

NON-HAZARDOUS WASTE MANIFEST

GENERATOR INFORMATION

Generator Name: DANCO BUILDERS

Address: 5251 ERICSON WAY

City: ARCATA County:

State: CA Zip: 95521

CUSTOMER/BILLING INFORMATION

Billing Name: NRCES

Address: 1605 FERRY POINT

City: ALAMEDA County:

State: CA Zip: 94501

Site Location (if different): FOSTER AVENUE, ARCATA, CA

Republic Services Approval #	Description of Waste	Volume/Weight	Expiration Date	Container Type
1004428	SOIL - DISPOSAL	20 TONS	2/2/2009	
	** MUST BE DELIV. NO LATER			
	THEN 12:00 PM.			

*Attach Additional Sheet if necessary

I hereby certify that the above described materials are non-hazardous wastes as defined by 40 CFR 261 or any applicable state law. Further, that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

David DelOsso — [signature] — 06 OCT 2008

Generator/Authorized Agent Name — Signature — Date Shipped

UPA
9B56849
502728

TRANSPORTER INFORMATION

Transporter Name: NRC Environmental — DOT#

Transporter Address: 1605 Ferry Point Alameda CA 94501 — Truck Number: 2501

Phone Number: 510-749-9615

I certify no hazardous waste or other regulated substance was knowingly introduced to the waste while in my custody. The waste transported in this vehicle is the waste identified above, to the best of my knowledge.

Jamesy Mills — [signature] — 10/6/08

Name of Authorized Agent — Signature — Date Delivered

DISPOSAL SITE INFORMATION

Site Name: POTRERO HILLS LANDFILL — Phone No. 707.432.4627

Site Address: 3675 POTRERO HIILLS LANE SUISUN, CA 94585

I hereby acknowledge receipt of the above described materials.

Janee Quinones — [signature] — 10/6/08

Name (Print or Type) — Signature — Date Received

Form SW02 (2003)

APPENDIX R

NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number

2. Page 1 of 1

3. Emergency Response Phone: NRCES 510-749-1390

4. Waste Tracking Number

GENERATOR

5. Generator's Name and Mailing Address: FOSTER AVENUE LLC
5251 ERICSON WAY
ARCATA, CA 95521

Generator's Site Address (if different than mailing address)
2000 FOSTER AVE
ARCATA, CA 95521

Generator's Phone: 707-825-1585

6. Transporter 1 Company Name: NRC ENVIRONMENTAL SERVICES INC.
U.S. EPA ID Number: CAR000030114

7. Transporter 2 Company Name
U.S. EPA ID Number

8. Designated Facility Name and Site Address
Crosby & Overton, Inc.
1630 W. 17th Street
Long Beach CA 90813
U.S. EPA ID Number: CAD028409010

Facility's Phone: 562 432-5445

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
	1. NON HAZARDOUS WASTE SOLID (SOIL WITH HYDROCARBONS)	01	DM	700	P	
	2. NON HAZARDOUS WASTE LIQUID (PURGE WATER)	02	DM	57	G	
	3.					
	4.					

13. Special Handling Instructions and Additional Information
USE PROPER PROPER PROTECTIVE EQUIPMENT
JOB/PO#: 37042
Profile # 96-1-51544
Profile # 96-2-51545

14. **GENERATOR'S CERTIFICATION:** I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Generator's/Offeror's Printed/Typed Name: Sean Armstrong
Signature
Month: 9 Day: 25 Year: 08

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: James D Mills
Signature: James D Mills
Month: 09 Day: 25 Year: 08

Transporter 2 Printed/Typed Name
Signature
Month Day Year

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator)
U.S. EPA ID Number

Facility's Phone:

17c. Signature of Alternate Facility (or Generator)
Month Day Year

18. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 17a

Printed/Typed Name
Signature
Month Day Year

City of ARCATA

City Manager	Environmental Services	Police	Recreation
(707) 822·5953	822·8184	822·2428	822·7091
Community Development	*Finance*	*Public Works*	*Transportation*
822·5955	822·5951	822·5957	822·3775

736 F Street
Arcata, CA 95521

M E M O R A N D U M

TO: Karen T. Diemer, City Manager

FROM: David Loya, Community Development Director; Mark Andre, Environmental Services Director; Doby Class, City Engineer

DATE: June 23, 2017

RE: Water and Wastewater Impact of Sunset Area Housing Projects

This memo addresses the environmental and fiscal impact of upzoned developments' demands on the City's wastewater treatment system. The analysis is based on the limitations of the current treatment plant and other facilities, the rationale for capital connections fees, and the current population and development trends throughout the City. The purpose is to outline the rationale and method for a fee to address upzoned properties' impacts. The analysis is based on population growth projections, an evaluation of land suitable for development, and the various guiding documents, including the General Plan and its Programmatic Environmental Impact Report, the fee resolution, and evaluations of the treatment plant's current capacity.

The City's wastewater treatment plant is currently undergoing a facilities plan update to determine present capacity and ability to serve the City's treatment needs. This work informs the City's ability to comply with its National Pollution Discharge Elimination System permit ("Discharge Permit") issued by the North Coast Regional Water Control Board ("Regional Board"). In summary, the wastewater treatment plant is underperforming, at times resulting in violations, and significant improvements must be made to bring the City into consistent compliance with the terms of its discharge permit.

The Regional Board has provided a time schedule order for compliance that has allowed continued use of the system and approval of development projects instead of imposing a development moratorium as long as the City continues to advance its development and implementation of compliance projects. If the City does not respond proactively to these capacity issues, the likelihood the Regional Board will impose a development cease and desist, or ban, on development is higher.

This memo provides the mitigation necessary to offset impacts of upzoning considering the City's current limitations on wastewater facilities. In particular, this memo distinguishes between nexus impacts, which are addressed by fees and capital projects, and the fair share of future planning of upzoned projects. The City recognizes the need to continue to proactively address current sewer system performance while working to bring the facilities into compliance and meet the City's sewage treatment needs.

APPENDIX S

Rationale

Critical to this analysis is the City's potential population growth given current zoning. If the full build out population plus the proposed upzoned units' population results in a smaller population than what was planned for in the General Plan, then the upzoned projects' impacts, though not explicitly identified in the General Plan, are contained within the General Plan analysis. If there are no extraordinary impacts, then the established fees and methods to address the infrastructure needed to service the planned population are appropriate to apply to the upzoned developments.

If the upzoned properties added to the full buildout population result in a larger than planned population, there are three options. The City could deny the projects, citing the lack of adequate resources to service them. The City could require the developments either avoid, reduce, or mitigate their impact. Or the City could accept that the projects would have an unmitigatable significant impact on the environment and approve them with an overriding consideration.

Method

We estimate total build out under current zoning using the 2014 City of Arcata Housing Element methodology of midpoint density for parcels, recognizing development constraints. We then make the connection between unit production potential under current residential zoning and population at full buildout based on Department of Finance (DOF) estimates of persons per household to estimate total population under full build out. We compared this estimate of buildout population plus projects population against the planned population. The City's Plan, adopted in 2000, planned for sewer treatment services for a population of 20,000.

The parcels considered under the full buildout scenario in this method is a subset of the parcels identified in the Housing Element. The Housing Element objective was to determine the complete housing stock potential based on all available land and current zoning. The objective of this analysis is to determine total feasible housing stock potential under current market conditions. Because we are using this estimate to evaluate whether the population associated with the upzoned projects would impact wastewater services, we include the likely buildout scenario given fiscal constraints, not the total buildout given only zoning constraints. To accomplish this analysis, vacant and underdeveloped properties that would require significant market pressure to make development feasible were removed from the analysis.

The vacant, residentially zoned parcel subset was confirmed parcel-by-parcel using readily available aerial imagery. We confirmed that the parcels were, in fact, vacant and that there were no obvious significant constraints, such as extreme slope or wetlands. The density of the subset was then calculated using the Housing Element method of midpoint density with a deduction for constraints.

The DOF data divide population into persons housed in households (houses, apartments, mobilehomes, etc.) and those in group quarters (dorms, shelters, etc.). Arcata has a relatively large and stable group quarters population living in HSU housing. This analysis estimated these populations by different methods. The household population was based on a total unit buildout estimate multiplied by persons per household. The group quarters population was based on the capacity of the existing and proposed units in group quarters.

We estimated buildout household population by adding the feasible buildout estimates to the total proposed upzone and annex housing stock and multiplying by persons per household. These estimates were based on the 2017 Department of Finance Population and Housing Estimates (DOF 2017). The

2017 estimated households were added to the total feasible buildout and the proposed units. A 4.5% vacancy rate was applied to estimate occupied units. The 4.5% vacancy is industry standard for real estate estimating, but the DOF housing data for 2011-2017 demonstrate lower vacancy for Arcata. The total number of occupied units was multiplied by the persons per household to arrive at total buildout population considering maximum unit count on all proposed and currently approved projects.

To estimate group quarters population, we added the proposed group quarters to the DOF 2017 estimate. The Village Student Housing project and the assisted living component of the Creekside Annexation are considered group quarters in this analysis. Current group quarters housing in Arcata is comprised of HSU dormitory housing. HSU reports that they have 2,100 units and typically run at 97% occupancy. Group quarters are expected to have a lower than market vacancy due to the demand for this type of housing. In this analysis, we applied a 3% vacancy to proposed group quarters, which is consistent with the projections provided by HSU. The estimates for population for households and group quarters were added to determine the full buildout population.

Results

Arcata's population was estimated at 18,374 in January 2017 (DOF 2017). This population estimate comprises 16,091 living in households and 2,283 living in group quarters. We added to these population estimates the estimated population using the method described above. The feasible buildout analysis resulted in a total of 252 units. In addition, the Sunset Terrace and Twin Parks projects, which have entitlements from the City, add 182 units. Other projects with entitlements that are included in the buildout potential include the 27th Street, Q Street, and the 30th Street subdivisions. The Canyon Creek and Creekside projects proposes to add 74 and 57 units, respectively. In total, estimated feasible buildout, prospective proposed, and entitled unit production is 565. To arrive at total unit count, this new production is added to the DOF estimated 2017 unit count of 7,967. The total number of units at full buildout is 8,532. Applying the vacancy rate of 4.5%, the total buildout occupied unit count is 8,148. The total household population under full buildout is 17,111 (8,148 x 2.1).

To determine total population, we added the group quarters population. The Village and Creekside projects propose 800 and 100 beds, respectively. After applying the 3% vacancy, this adds 873 people to the 2,283 DOF estimated 2017 group quarters population. The total group quarters population under buildout is 3,156. The total population under full buildout with group quarters is 20,267. These data are summarized below (Table 1).

Discussion

While we estimated population over the 20,000 considered in the General Plan, the estimate is within the margin of error for the actual wastewater treatment capacity. This analysis estimates a high full buildout population of 20,267, which is 1.3% greater than the planned total of 20,000. Furthermore, the capacity is continuous, not finite. That is, the plant will continue to perform at higher capacity, but less efficiently.

Furthermore, the estimate has a margin of error that includes the target population of 20,000 within the confidence interval. This means that though the population as estimated here is numerically over 20,000, actual population at buildout may be less than 20,000 owing to the error in the method. We note that the DOF 2017 group quarters population estimate is likely high. As discussed above, HSU, the only current contributor to group quarters population, has 2,100 beds. The difference between DOF estimated group quarters and actual units available for group quarters is 183. While this is not the only

source of error in the estimation, we use this difference as the margin of error. This puts the population estimate at full buildout between 20,084 and 20,267.

Table 1. Tabulated Results of Housing and Population Estimates.

	Estimated Units	Population w/ 4.5% Vacancy
2017 DOF Estimated Units	7,967	15,978
Vacant Residential	252	505
Subtotal	**8,219**	**16,483**
Household Units		
Entitled - Not Built		
Sunset Terrace	142	285
Twin Parks	40	80
Subtotal	**182**	**365**
Under Review		
Canyon Creek	74	148
Creekside	57	114
Subtotal	**131**	**263**
Total Units	**8,532**	**17,111**
Occupied Units (4.5% Vacancy)	8,148	
Household Population	**17,111**	
Group Quarters Population		
2017 DOF Estimated Units	2,283	
Village	776	
Creekside	97	
Group Quarters Population	**3,156**	
Total Population	**20,267**	

Notwithstanding the error in the method and the buffer built into the wastewater system, the impact of upzoning on the wastewater system should be offset by improvements to the system. The General Plan described the wastewater treatment plant as underperforming in 2000. It identified inflow and infiltration as major contributors to capacity issues, but it also identified compliance issues related to wastewater strength. The Plan called for periodic reviews of the plant and improvements including added land-based and conventional treatment solutions. Actual improvements were to be recommended through the periodic assessments and, to date, approximately $4MM in inflow and infiltration projects have been completed. Furthermore, the City is currently renewing its wastewater discharge permit, which will require approximately $40MM of improvements to bring the plant into compliance. Ongoing performance evaluation and improvements to the facilities were the explicit

strategy identified to accommodate the projected population growth to 20,000. The work the City is doing now to address compliance with the wastewater discharge permit is identifying specific improvements.

To undertake the necessary improvements, capital is needed. Capital connection fees are an important source of funding for the identified improvements and operations. Capital connection fees are comprised of two charges. A capacity fee is a one-time fee that is charged for new, additional, or larger connections to the City's utility system. Capacity fees recover the costs associated with providing additional facility capacity to new users and existing users requiring additional capacity. Connection fees are used to recover costs associated with the physical installation of lateral connections to the utility system, and can be thought of as "plumbing charges".

The City is not currently under a development moratorium despite its periodic treatment noncompliance. To the extent that population associated with any new development contributes to noncompliance, the City must continue to proactively develop improvements that provide additional treatment. The connection fees collected for new development will be dedicated to the identified improvements, thereby contributing to maintaining the facility's compliance. The connection fee is a mechanism to address new developments' impact on both water distribution and wastewater treatment systems' capacity and compliance.

The capital connection fees for wastewater are assessed based on the number of fixture units included in the project. Wastewater fees are set annually through the budget process. The collection of these fees, along with monthly service charges, are directed to the City's water and wastewater enterprise funds and are used only to pay for capital improvements and operations costs.

Notwithstanding the fact that the connection fee is the method the City has for addressing capital improvements necessary to maintain compliance and service needs, growth beyond the scope of the total population projected in the General Plan will require both additional environmental analysis and new wastewater facilities. The General Plan established a threshold for population that the City's infrastructure is anticipated to support. And while the projected total buildout population is within actual service capacity, a population over 20,000 will further stress both wastewater and water services.

Based on the estimated population for feasible buildout, there is very little additional planned capacity for wastewater treatment. Currently zoned residential parcels added to current population estimates totals 18,766 of the 20,000 total planned capacity of the wastewater treatment plant. This leaves a balance of 1,234 people. The upzone projects currently under entitlement review and projects with entitlements, but not yet built, constitute approximately 1,500 additional people.

Conclusion

This estimating approach leads to a population just over the 20,000 envisioned for the planning period. Evaluating the actual projects currently in planning, including approved but not built, built since Housing Element adoption, and upzones proposed but not formalized, total population will reach between approximately 20,084 and 20,267. Of this, approximately 566 persons in 283 households are from properties currently zoned and planned for residential development. This growth is anticipated over the next five years and will be the largest population increase Arcata has experienced since the 1950s.

In sum, there is planned wastewater treatment capacity for 20,000 people and actual capacity for slightly more. Current potential and planned development projects may yield a slightly higher population, depending on household characteristics. All of this development is within the margins of

planning for the facilities; however, the facilities must be improved to meet the demand of both current and future population. The City has plans to improve the treatment plant and water service capacity. The primary method for paying for these improvements from the ratepayers comes from the capacity charge portion of the capital connection fees and monthly rates for service. Because the wastewater treatment facility is near the end of its planning horizon, any upzoned property will pay both a capital connection fee, pursuant to its direct impact on the facilities, as well as a fee negotiated through a development agreement to offset the future planning or development needs of the facilities.

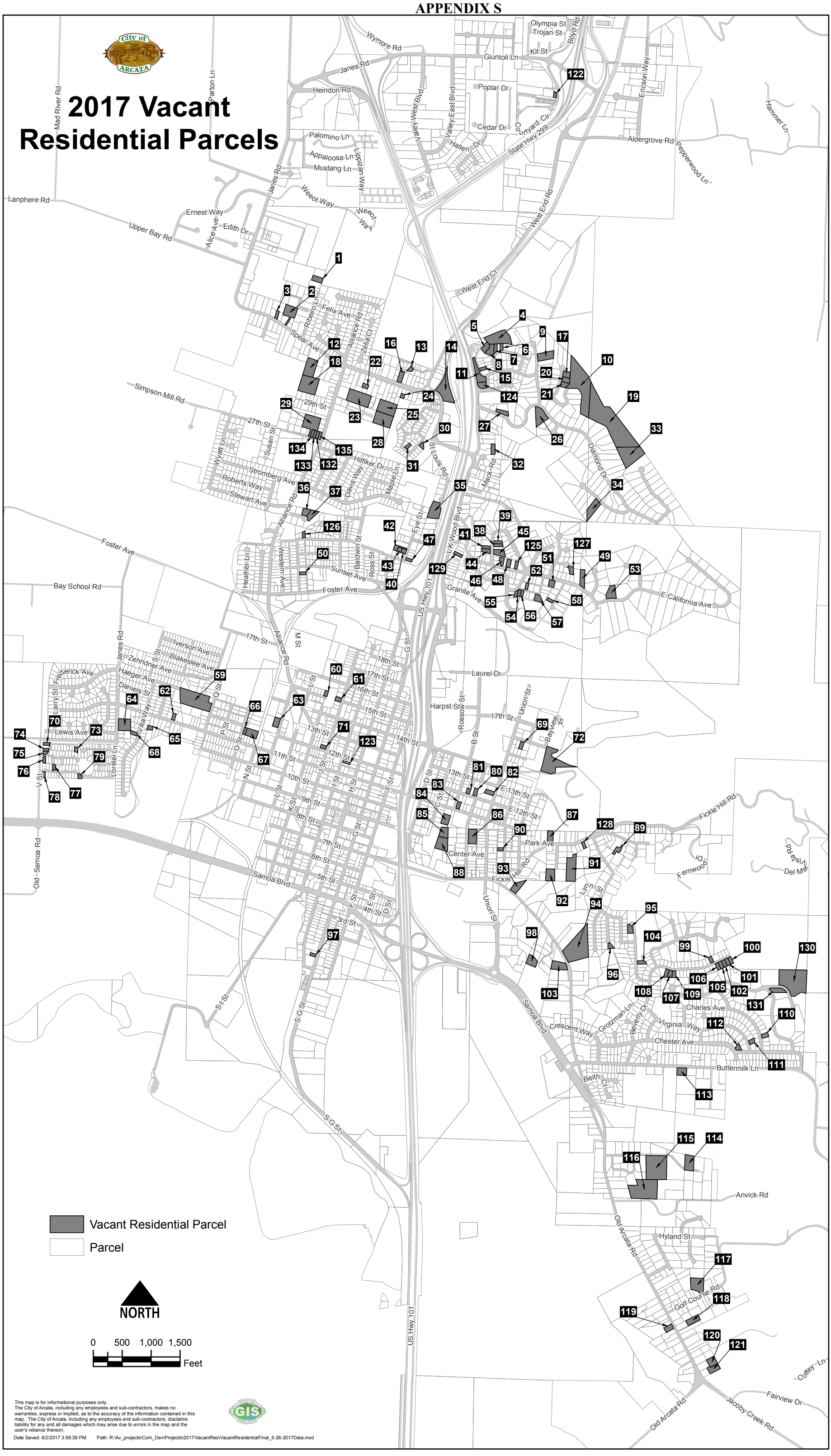
Attachments
Map of Vacant Residential Parcels (2017)

Citations

State of California, Department of Finance, *E-5 Population and Housing Estimates for Cities, Counties and the State — January 1, 2011- 2017*. Sacramento, California, May 2017

City of Arcata *Housing Element*. Arcata, California, July 2014

APPENDIX S



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3	507-191-038
4	507-481-001
5	507-023-001
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9	507-491-001
10	507-031-009
11	507-021-013
12	507-331-033
13	507-101-049
14	507-071-004
15	507-022-023
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17	507-501-002
18	507-331-020
19	503-511-001
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21	507-501-004
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24	507-092-028
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134	507-331-065
135	507-331-062

APPENDIX T.1

Central Arcata Areawide Traffic Study

Prepared for the City of Arcata

Submitted by
W-Trans

March 13, 2017

TRAFFIC ENGINEERING
TRANSPORTATION PLANNING
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APPENDIX T.1

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Executive Summary

The *Central Arcata Areawide Traffic Impact Study* was commissioned by the City to address the cumulative traffic impacts associated with potential development of six sites located within less than three-quarters of a mile of one another. To provide information that can be used in the environmental clearance process for these projects, the impacts of each project were assessed individually as well as all together. The locations of the following six project sites are shown in Figure 1: The Village, Canyon Creek, Sunset Terrace, Open Door Health Center, Twin Parks, and Creekside Homes (Foster Avenue Annexation).

The study area included seven intersections for five of the projects, but was expanded to twelve existing and two new intersections for the Creekside Home project. Further, conditions with Foster Avenue connected or left in its current configuration were both evaluated.

Of the twelve study intersections, only one was found to be operating below the City's desired threshold under existing volumes. However, potential improvements to add capacity would have a negative impact on pedestrian and bicycle access, so a lower service level was deemed adequate at this location.

The addition of project-generated trips resulted in the need for restriping to provide turn lanes on Alliance Road at Foster Avenue with all but the Twin Parks project; with the Foster Avenue connection and the Creekside Homes project a turn lane is also needed on the west leg of Foster Avenue. Consideration was given to, restriping 11th Street at K Street to address reduced service levels associated with the Creekside Homes project; however, because such an improvement would require modifying the curb return radii, eliminating a section of bike lane, and prohibiting parking, the negative impacts were deemed more substantial than the potential improvements and a lower service level was deemed adequate for this location.

Improvements are needed at three locations to maintain or achieve acceptable operation under the 20-year horizon volumes projected using a growth factor of 1.5 percent per year. Installation of a five-legged roundabout at the intersections of Sunset Avenue/US 101 North ramps and LK Wood Boulevard is recommended to achieve acceptable operation, improve pedestrian and bicycle access, and eliminate the existing non-standard and potentially confusing configuration. Similarly, a roundabout is recommended at Foster Avenue/Alliance Road to accommodate projected future traffic volumes.

The improvements recommended for "without project" conditions are adequate to achieve acceptable operation upon the addition of all six projects to Future volumes, with one exception as noted below, and the proportional share that each project should contribute to help pay for these improvements was calculated and is noted in the body of the report. The exception is Sunset Avenue/US 101 North ramps-LK Wood Boulevard, which is projected to operate at LOS D during the p.m. peak hour with all projects added to future volumes.

Because the analysis is based on a growth factor rather than site-specific development potential, the growth in traffic projected can reasonably be expected to include project-generated trips. In this case, the projected Future volumes could be considered to reflect Future plus All Projects, a scenario under which acceptable condition can be achieved for all of the study intersections. In order to avoid providing excess capacity, which must often come at the expense of pedestrian and bicycle safety and comfort, it is recommended that no improvements beyond those identified for Future conditions (without the projects) be made without further study. To aid the City in determining when additional analysis may be appropriate, thresholds in terms of the number of new housing units permitted were developed and are provided in the body of the report.

Access for pedestrian, bicyclists and to transit was also considered. While sidewalks exist along some of the streets in the study area and the City's system of trails and bike lanes in the area is good, improvements are recommended for each individual project to ensure that frontage improvements are made, connections between each site and the regional network of trails are constructed and facilities to support bicycle travel, such as bike racks,

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Central Arcata Areawide Traffic Impact Study

Figure 1 – Study Area and Project Locations

W-Trans

are provided as part of each development. Specifically, new segments of the trail along the railroad right-of-way should be constructed by The Village and Canyon Creek projects, a crossing of Foster Avenue should be provided by either the Sunset Terrace or Open Door Health Center project, and the Creekside project should have trail and/or sidewalk connections to Alliance Road as well as the terminus of Foster Avenue near Heather Lane.

Comments were received on the draft version of this document, and these are provided in Appendix A along with responses to any comments not addressed through changes to the document itself.

Introduction

This report presents an analysis of the potential traffic impacts that would be associated with development of six separate projects located in the central part of the City of Arcata west of US 101. In order to assess the cumulative traffic impacts of all of the proposed and potential projects in a relatively small area, a combined analysis of the traffic associated with all six sites was requested by City staff. The traffic study was completed in accordance with the criteria established by the City of Arcata, and is consistent with standard traffic engineering techniques.

Prelude

The purpose of a traffic impact study is to provide City staff and policy makers with data that they can use to make an informed decision regarding the potential traffic impacts of a proposed project, and any associated improvements that would be required in order to mitigate these impacts to a level of insignificance as defined by the City's General Plan or other policies. Vehicular traffic impacts are typically evaluated by determining the number of new trips that the proposed use would be expected to generate, distributing these trips to the surrounding street system based on existing travel patterns or anticipated travel patterns specific to the proposed project, then analyzing the impact the new traffic would be expected to have on critical intersections or roadway segments. Impacts relative to access for pedestrians, bicyclists, and to transit are also addressed.

Project Profile

The six projects included in the Central Arcata Traffic Analysis are detailed below.

The proposed **Village Project** would develop 240 dorm units, 800 beds, on the southern limit of St Louis Road. Only a pedestrian and cyclist connection is proposed between the project site and Eye Street, which northern limits dead end at the southern frontage of the project site. A preliminary site plan is included in Appendix B.

Canyon Creek proposed project includes 74 apartments units located between Eye Street and US 101 South with access where Eye Street has a 90 degree turn, approximately 300 feet east of Jay Street.

Sunset Terrace Project would include 142 apartment located south of Sunset Avenue, north of Foster Avenue, and west of the proposed Open Door Community Health Center. Project access would be only from Foster Avenue.

Open Door Community Health Center proposed project is located west of the Sunset Avenue/Foster Avenue-Jay Street roundabout. The proposed project would develop approximately 30,000 square feet of health offices. The only vehicular project access would be Foster Avenue.

Twin Parks Apartments Project would be located on the southeast corner of the Alliance Road/Foster Avenue intersection. The project would include 40 apartment units and it was assumed project access would be from both Foster Avenue and Alliance Road.

Creekside Homes (**Foster Avenue Annexation)** proposed project would be located north of Foster Avenue with the lower southeast corner located at the Foster Avenue-Q Street bend west of the McDaniel Slough, also referred to as Janes Creek. The proposed project would include a 100 assisted living units and 89 single family homes. An additional scenario will be analyzed in which the Foster Avenue is connected. Currently, the McDaniel Slough separates the avenue. A preliminary site plan is included in Appendix B.

Transportation Setting

Operational Analysis

Study Area and Periods

The study area consists of the following intersections:

1. St. Louis Road/US 101 Overpass
2. LK Wood Boulevard/US 101 Overpass
3. Sunset Avenue/LK Wood Boulevard
4. Sunset Avenue/US 101 NB Ramps
5. Sunset Avenue/US 101 SB Ramps-G Street-H Street
6. Sunset Avenue/Foster Avenue-Jay Street
7. Foster Avenue/Alliance Road

For the Creekside Homes project, the study area also includes the following intersections

8. 17th Street/Q Street
9. 17th Street/Alliance Road
10. 11th Street/K Street
11. 11th Street/Janes Road
12. Foster Avenue/Janes Road
13. Foster Avenue/Creekside Project Entrance (future intersection)
14. Q Street/Foster Avenue (potential future intersection with Foster Avenue extension)

Operating conditions during the a.m. and p.m. peak periods were evaluated to capture the highest potential impacts for the proposed projects as well as the highest volumes on the local transportation network. The morning peak hour typically occurs between 7:00 and 9:00 a.m. and reflects conditions during the home to work or school commute, while the p.m. peak hour occurs between 4:00 and 6:00 p.m. and typically reflects the highest level of congestion during the homeward bound commute.

Study Intersections

St. Louis Road/US 101 Overpass is a three-legged intersection, with stop controls on the northbound St. Louis Road and westbound overpass approaches. There is a crosswalk across the overpass approach.

LK Wood Boulevard/US 101 Overpass is also a three-legged intersection, with the southbound LK Wood approach stop-controlled. Although this intersection has stop controls on the northbound and eastbound approaches, because the overpass approach curves into the south leg of LK Wood, it essentially creates a standard tee intersection with the terminating southbound approach stop-controlled.

Sunset Avenue/LK Wood Boulevard is an all-way stop-controlled tee intersection that is separated from the ramps at US 101 North by less than 150 feet. It has separate right-turn lanes on the eastbound approach for both Sunset Avenue and the US 101 North off-ramp that converge just as they enter LK Wood Boulevard. The only crosswalk at the intersection is across the south leg of the intersection, and it crosses the eastbound right-turn lane coming from Sunset Boulevard but not the one from US 101 North.

Sunset Avenue/US 101 NB Ramps is a four-legged intersection with the off- and on-ramps forming the south and north legs of the intersection respectively. The off-ramp approach is stop-controlled and has a crosswalk connecting through to LK Wood Boulevard.

Sunset Avenue/US 101 SB Ramps-G Street-H Street is a four-legged, all-way stop-controlled intersection with a crosswalk on the south leg only. G and H Streets form a one-way couplet, with G Street serving the northbound approach to the intersection and H Street carrying southbound traffic away from intersection.

Sunset Avenue/Foster Avenue-Jay Street was recently converted to roundabout control, with crosswalks on all four legs of the intersection.

Foster Avenue/Alliance Road is a four-legged intersection with stop controls and crosswalks on all four approaches.

17th Street/Q Street is a three-legged intersection, with *de facto* stop-control on the northbound Q Street. There is a yellow crosswalk (school crossing) on the south leg of the intersection.

17th Street/Alliance Road is a three-legged intersection with stop control on the eastbound approach and a yellow crosswalk is the west leg.

11th Street/K Street is also a four-legged, all-way stop-controlled intersection with crosswalks on each leg.

11th Street/Janes Road is a four-legged intersection with stop-controls on the east and west leg. There is only a crosswalk on the west leg.

Foster Avenue/Janes Road is a three-legged intersection with stop-control on the northbound Janes Road.

The locations of the study intersections are shown in Figure 1, and the existing lane configurations and controls are shown in Figure 2.

Collision History

The collision histories for the study intersections were reviewed to determine any trends or patterns that may indicate a safety issue. Collision rates were calculated based on records available from the California Highway Patrol as published in their Statewide Integrated Traffic Records System (SWITRS) reports. The most current five-year period available is January 1, 2011 through December 31, 2015.

As presented in Table 1, the calculated collision rates for the study intersections were compared to average collision rates for similar facilities statewide, as indicated in *2012 Collision Data on California State Highways*, California Department of Transportation (Caltrans). These average rates statewide are for intersections in the same environment (within an urban boundary), with the same number of approaches (generally four-legged or tee intersections), and the same controls (all-way stops, two-way stops, etc.) As indicated in the table, eight of the twelve existing study intersections experienced collisions at a rate higher than the statewide average for similar facilities. The collision rate calculations are provided in Appendix C.

APPENDIX T.1

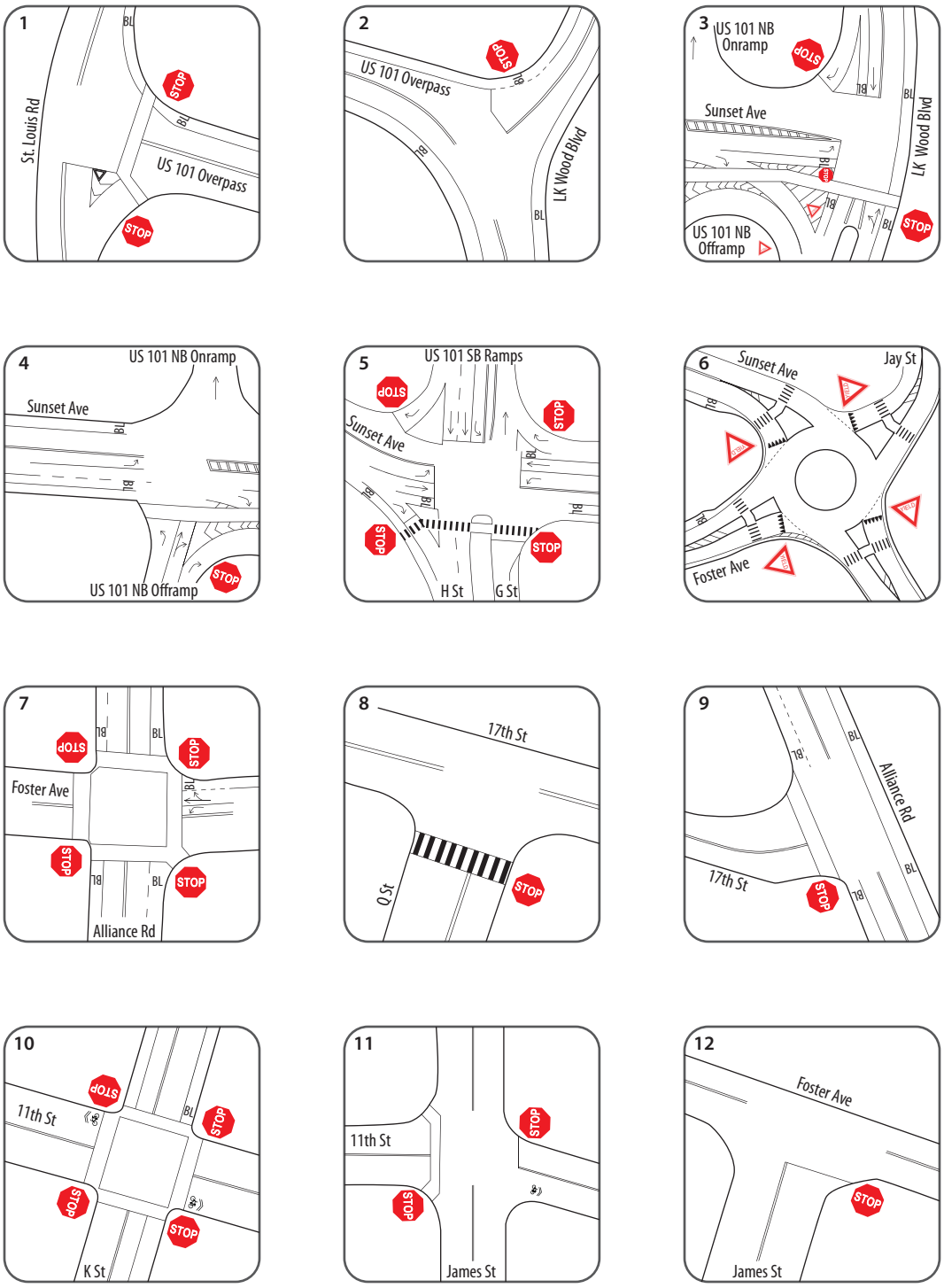

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Figure 2 – Existing Lane Configurations

Table 1 – Collision Rates at the Study Intersections

Study Intersection	Number of Collisions (2011-2015)	Calculated Collision Rate (c/mve)	Statewide Average Collision Rate (c/mve)
1. St. Louis Rd/US 101 Overpass	2	**0.30**	0.18
2. LK Wood Blvd/US 101 Overpass	0	0.00	0.18
3. Sunset Ave/LK Wood Blvd	3	**0.12**	0.05
4. Sunset Ave/US 101 NB Ramps	4	**0.18**	0.15
5. Sunset Ave/US 101 SB Ramps-G St-H St	10	**0.41**	0.21
6. Sunset Ave/Foster Ave-Jay St	1	0.08	0.18
7. Foster Ave/Alliance Rd	5	**0.23**	0.21
8. 17th St/Q St	0	0.00	0.06
9. 17th St/Alliance Rd	3	**0.19**	0.18
10. 11th St/K St	5	**0.24**	0.21
11. 11th St/Janes Rd	4	**0.68**	0.15
12. Foster Ave/Janes Rd	0	0.00	0.18

Note: c/mve = collisions per million vehicles entering; **Bold** = collision rate higher than the Statewide average

Further review was performed to determine any trends or concerns present at those locations with above-average collision rates. It is noted that the statewide rates are for highway facilities that generally carry much higher volumes; because the volumes are relatively low at some of the study intersections, even a nominal number of crashes results in an above-average collision rate. Consideration was therefore given not just to the rate, but also to the actual number of crashes reported.

St. Louis Road/US 101 Overpass – the two collisions involved drivers going in opposite directions on opposite sides of the intersection, with one crash involving two vehicles and the other a single vehicle, so no clear pattern was evident. It is noted that the unusual configuration of stop controls (the southbound approach is uncontrolled while the opposing northbound approach as well as the westbound approach are stop-controlled) may cause some driver confusion, so consideration could be given to converting this location to all-way stop controls to eliminate any confusion over the right-of-way assignment.

Sunset Avenue/LK Wood Boulevard – Despite having all-way stop controls, there were two broadside collisions reported, and one involved a driver turning right from the eastbound approach. With two right-turn lanes, a long crosswalk connecting across the adjacent intersection at US 101 North Ramps, and a bike lane, the geometrics of this location present challenges that have translated to a collision rate that is more than double the statewide average for all-way stop controlled intersections. Modification of this intersection to provide more standard geometrics would be expected to reduce the incidence of collisions.

Sunset Avenue/US 101 North Ramps – Like the adjacent intersection at LK Wood Boulevard, this intersection has a challenging configuration, especially for pedestrians and bicyclists. Of the four collisions reported at this location, three involved either a pedestrian or a cyclist, and one resulted in a pedestrian fatality. As noted for the LK Wood Boulevard intersection, modifications to provide a more standard configuration could address these concerns.

Sunset Avenue/US 101 South Ramps-G Street-H Street – Of the ten reported collisions, six involved right-of-way infractions, and two of these involved a pedestrian or cyclist. Additionally, there was one pedestrian fatality at this intersection. While no specific pattern emerged from the review, it appears that some enforcement of right-of-way laws may be beneficial.

Foster Avenue/Alliance Road – Three of the five collisions involved right-of-way violations, and two of these included either a pedestrian or a cyclist. Given the number of collisions noted at this intersection and others that involve pedestrians and bicyclists, a public safety campaign to remind such road users of their responsibility to follow the laws in the vehicle code may prove beneficial. Alternatively, additional enforcement of right-of-way laws at the intersection could also be beneficial.

17th Street/Alliance Road – Of the three collisions reported, two were single-vehicle crashes and one was due to an impaired driver. Given the limited number of crashes as well as the minimal amount by which the average rate was exceeded, no remedial measures are suggested.

11th Street/K Street – Four of the five collisions reported at this all-way stop-controlled intersection were broadsides. As noted above for pedestrians and bicyclists, a public safety campaign to reinforce the rules for right-of-way assignment at all-way stop-controlled intersections may help reduce the number of incidents.

11th Street/Janes Road – Three of the four collisions at this location were broadsides between southbound and westbound vehicles that occurred between 4:00 and 4:30 p.m. Sight lines appear to be adequate, and speed was *not* indicated as a collision factor, so it is unclear what precipitated this trend. Because the calculation rate has the volume in the denominator, the rate at this location is quite high despite the fact that there were on four collisions in five years, or less than one per year. While no mediation is suggested, the City may want to perform reviews of the collision record at this location occasionally to determine if a safety concern is developing.

Alternative Modes

Pedestrian Facilities

Pedestrian facilities include sidewalks, crosswalks, curb ramps, curb extensions, and various streetscape amenities such as lighting, benches, etc. While there are some pedestrian facilities in the vicinity of the project sites, sidewalk gaps, obstacles, and barriers can be found along some or all of the connecting roadways. Existing gaps and obstacles along the connecting roadways impact convenient and continuous access for pedestrians and present safety concerns in those locations where appropriate pedestrian infrastructure would address potential conflict points.

- **Alliance Road** – Sidewalks exist continuously on Alliance Road on either one side of the street or the other, with crosswalks connecting locations where the sidewalk switches from one side to the other. Additionally, crosswalks exist at many of the study intersections.

- **Foster Avenue** – Intermittent sidewalk coverage is provided on Foster Road with significant gaps on the northerly side between Alliance Road and Jay Street. A pathway was recently constructed on the south side of the street that connects to existing facilities at Jay Street and Alliance Road, but access from Foster Avenue is currently limited to a connect at Eastern Avenue. Curb ramps and crosswalks at side street approaches are intermittent, non-existent, or not compliant with current ADA standards. Lighting is provided by overhead streetlights.

- **Eye Street/Jay Street** – Both of these streets have intermittent, discontinuous sidewalk facilities, and shoulder areas are of limited width, include drainage ditches, and may be impassable in wet weather due to mud. Pedestrians must walk in the street along most of the route from the Canyon Creek site to Sunset Avenue.

- **LK Wood Boulevard** – There is continuous sidewalk on the east side of this street, with a crosswalk connecting to the termination of the sidewalk on the west side that then connects to the US 101 Overpass.

- **St. Louis Road** – This roadway has no pedestrian facilities south of the US 101 Overpass. The road is narrow, with limited shoulder area, so pedestrian traffic would typically be required to walk in the roadway.

- **Sunset Avenue** – Continuous sidewalks are provided on the south side of this street east of Jay Street where there is a connection to the regional trail system. The geometrics of the intersections with US 101 North and LK Wood Boulevard result in pedestrians traveling a substantial distance in crosswalks crossing both of these intersecting streets in a configuration that is difficult and results in undesirable crossing conditions.

- **US 101 Overpass** – The existing sidewalk on the south side of the overpass connects St. Louis Road to LK Wood Boulevard.

Bicycle Facilities

The *Highway Design Manual*, Caltrans, 2012, classifies bikeways into three categories:

- **Class I Multi-Use Path** – a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross flows of motorized traffic minimized.

- **Class II Bike Lane** – a striped and signed lane for one-way bike travel on a street or highway.

- **Class III Bike Route** – signing only for shared use with motor vehicles within the same travel lane on a street or highway.

Guidance for Class IV Bikeways is provided in *Design Information Bulletin Number 89: Class IV Bikeway Guidance (Separated Bikeways/Cycle Tracks)*, Caltrans, 2015.

- **Class IV Separated Bikeway/Cycle Track** – a bikeway for the exclusive use of bicycles and requires physical separation such as grade separations, flexible posts, inflexible physical barriers, or on-street parking between the bikeway and through vehicular traffic.

In the project area, Class II bike lanes exist on Alliance Road-K Street between Spear Avenue and 11th Street and Class III bike routes exist on Foster Avenue between Jay Street and Alliance Road. Bicyclists ride in the roadway and/or on sidewalks along other streets within the project study area. Table 2 summarizes the existing and planned bicycle facilities in the project vicinity, as contained in the *City of Arcata Pedestrian and Bicycle Master Plan*, 2010.

Table 2 – Bicycle Facility Summary				
Status **Facility**	**Class**	**Length (miles)**	**Begin Point**	**End Point**
Existing				
Alliance Road	II	1.40	Spear Avenue	11th Street
L.K. Wood Boulevard	II	0.97	US 101 Overpass	14th Street
Spear Avenue	II	0.70	Janes Road	St. Louis Road
St. Louis Road	II	0.20	Spear Avenue	US 101 Overpass
Sunset Avenue	II	0.13	L.K. Wood Boulevard	G Street
US 101 Overpass	II	0.20	St. Louis Road	LK Wood Boulevard
Foster Avenue	II	0.37	Jay Street	Alliance Road
Planned				
Annie & Mary Rail Trail	I	3.00	West End Road	Arcata Skate Park
Hammond Trail	I	1.40	Western City Limits	Annie & Mary Rail Trail
Sunset Avenue	II	0.45	Western Avenue	H Street
Baldwin Street	III	0.22	Cahill Park	Sunset Ave
Stromberg Avenue-Maple Lane	III	0.38	Janes Creek Linear Trial	Alliance Road

Source: *City of Arcata Pedestrian and Bicycle Master Plan*, 2010

Transit Facilities

The Humboldt Transit Authority (HTA) provides fixed route bus service in the City of Arcata through the Arcata and Mad River Transit System (AMRTS) and the Redwood Transit System (RTS). AMRTS Gold Route provides loop service to destinations throughout the City and stops on Alliance Road at the Foster Avenue Extension within the project vicinity. Gold Route operates Monday through Friday with approximately one-hour headways between 7:00 a.m. and 10:00 p.m. AMRTS Orange Route provides Saturday service with approximately one-hour headways between 7:00 a.m. and 7:00 p.m.

Redwood Transit System (RTS) Routes 100 to 115 provide regional service between the City of Arcata and surrounding communities in Humboldt County. Each route stops at the Arcata Transit Center between 9th Street and 10th Street operating Monday through Friday with approximately one to three hour headways between 6:30 a.m. and 10:00 p.m. Saturday and Sunday service operates with approximately one to three hour headways between 9:00 a.m. and 8:00 p.m.

Two bicycles can be carried on most HTA buses. Bike rack space is on a first come, first served basis. Additional bicycles are allowed on HTA buses at the discretion of the driver.

Dial-a-ride, also known as paratransit, or door-to-door service, is available for those who are unable to independently use the transit system due to a physical or mental disability. Arcata Dial-A-Ride service is designed to serve the needs of individuals with disabilities within the City of Arcata and the greater City of Arcata area.

Capacity Analysis

Intersection Level of Service Methodologies

Level of Service (LOS) is used to rank traffic operation on various types of facilities based on traffic volumes and roadway capacity using a series of letter designations ranging from A to F. Generally, Level of Service A represents free flow conditions and Level of Service F represents forced flow or breakdown conditions. A unit of measure that indicates a level of delay generally accompanies the LOS designation.

The study intersections were analyzed using methodologies published in the *Highway Capacity Manual* (HCM), Transportation Research Board, 2010. This source contains methodologies for various types of intersection control, all of which are related to a measurement of delay in average number of seconds per vehicle.

The Levels of Service for the intersections with side-street stop controls, or those which are unsignalized and have one or two approaches stop controlled, were analyzed using the "Two-Way Stop-Controlled" intersection capacity method from the HCM. This methodology determines a level of service for each minor turning movement by estimating the level of average delay in seconds per vehicle. Results are presented for individual movements together with the weighted overall average delay for the intersection.

The study intersections with stop signs on all approaches were analyzed using the "All-Way Stop-Controlled" Intersection methodology from the HCM. This methodology evaluates delay for each approach based on turning movements, opposing and conflicting traffic volumes, and the number of lanes. Average vehicle delay is computed for the intersection as a whole, and is then related to a Level of Service.

Intersections that are currently or are proposed to be controlled by modern roundabouts were evaluated using the FHWA Roundabout Method, also contained within the Unsignalized Methodology of the HCM. This methodology determines intersection operation using the gap acceptance method using basic geometric and volume data to calculate entering and circulating flows. This information is then translated to an overall average vehicle delay, with LOS break points at the same delays as used in the signalized methodology. Because the HCM roundabout methodology is relatively unsophisticated, the much more advanced SIDRA roundabout analysis software was utilized in any cases where the basic HCM methodology predicts operation worse than LOS B.

The ranges of delay associated with the various levels of service are indicated in Table 3.

Table 3 – Intersection Level of Service Criteria			
LOS	**Two-Way Stop-Controlled**	**All-Way Stop-Controlled**	**Roundabout**
A	Delay of 0 to 10 seconds. Gaps in traffic are readily available for drivers exiting the minor street.	Delay of 0 to 10 seconds. Upon stopping, drivers are immediately able to proceed.	Delay of 0 to 10 seconds.
B	Delay of 10 to 15 seconds. Gaps in traffic are somewhat less readily available than with LOS A, but no queuing occurs on the minor street.	Delay of 10 to 15 seconds. Drivers may wait for one or two vehicles to clear the intersection before proceeding from a stop.	Delay of 10 to 20 seconds.
C	Delay of 15 to 25 seconds. Acceptable gaps in traffic are less frequent, and drivers may approach while another vehicle is already waiting to exit the side street.	Delay of 15 to 25 seconds. Drivers will enter a queue of one or two vehicles on the same approach, and wait for vehicle to clear from one or more approaches prior to entering the intersection.	Delay of 20 to 35 seconds.
D	Delay of 25 to 35 seconds. There are fewer acceptable gaps in traffic, and drivers may enter a queue of one or two vehicles on the side street.	Delay of 25 to 35 seconds. Queues of more than two vehicles are encountered on one or more approaches.	Delay of 35 to 55 seconds.
E	Delay of 35 to 50 seconds. Few acceptable gaps in traffic are available, and longer queues may form on the side street.	Delay of 35 to 50 seconds. Longer queues are encountered on more than one approach to the intersection.	Delay of 55 to 80 seconds.
F	Delay of more than 50 seconds. Drivers may wait for long periods before there is an acceptable gap in traffic for exiting the side streets, creating long queues.	Delay of more than 50 seconds. Drivers enter long queues on all approaches.	Delay of more than 80 seconds.

Reference: *Highway Capacity Manual,* Transportation Research Board, 2010

Traffic Operation Standards

City of Arcata

In the absence of an adopted policy, through discussions with staff of the City of Arcata, an operational threshold of LOS C was identified as being the desired minimum to be used for analysis purposes, with this threshold to be applied to the operation of the intersection as whole and not that of any one movement or approach. Further, the City's preference has been not to use traffic signals to achieve acceptable operation, instead using all-way stop controls where feasible or roundabouts where volumes exceed what can be handled by a stop-controlled intersection. The need for improvements to increase capacity and reduce delay was therefore considered only where the overall intersection delay was projected to exceed 25 seconds. However, if it was determined that feasible improvements would have a negative impact on pedestrian and/or bicycle access, priority was given to maintaining access for pedestrians and bicyclists, and lower service levels for vehicle operation were considered acceptable.

Caltrans

Caltrans indicates that they endeavor to maintain operation at the transition from LOS C to LOS D. Based on previous discussions with Caltrans staff, it is understood that the standard is to be applied to the overall average intersection delay and *not* that associated with any single movement or approach. Under this approach, if one movement experiences very high delay and also has moderate to high traffic volumes, the overall delay and level

of service should reflect the critical nature of the condition. However, if one movement is expected to experience high delay, but has very low traffic volumes, the overall intersection operation will likely still meet Caltrans standards.

Humboldt State University

The intersection of Sunset Avenue/LK Wood Boulevard is owned and operated by Humboldt State University. It is understood from the University that their emphasis is placed on pedestrian and bicycle access and safety, with operation for vehicular traffic given a lesser priority. Improvements at this intersection were therefore considered for operation of LOS D or lower, though lower service levels were deemed acceptable if improvements necessary to achieve a higher service level would negatively impact pedestrian and/or bicycle access.

Existing Conditions

The Existing Conditions scenario provides an evaluation of current operation based on existing traffic volumes during the a.m. and p.m. peak periods. This condition does not include project-generated traffic volumes. Volume data was collected on March 3, 2016, while local schools, including Humboldt State, were in session.

In order to analyze the St. Louis Road/US 101 Overpass tee-intersection, which has two stop-controlled and one free approach, it was modeled as a four-legged intersection. The stop-controlled westbound approach to the intersection was input separately from the receiving lane on that same leg. The northbound approach and receiving lane was modeled as one leg; the southbound approach was similarly modeled.

Intersection Levels of Service

Under existing conditions, all but one of the study intersections are operating acceptably at LOS C or better during both peak periods evaluated. Sunset Avenue/LK Wood Boulevard is currently operating at LOS E during the p.m. peak period, which is below the threshold applied though still considered acceptable for this location as potential improvements identified as being feasible to improve vehicular operation would have a negative impact on pedestrian and bicycle access, so were rejected by Humboldt State University representatives. The existing traffic volumes are shown in Figure 3. A summary of the intersection level of service calculations is contained in Table 4, and copies of the Level of Service calculations are provided in Appendix D.

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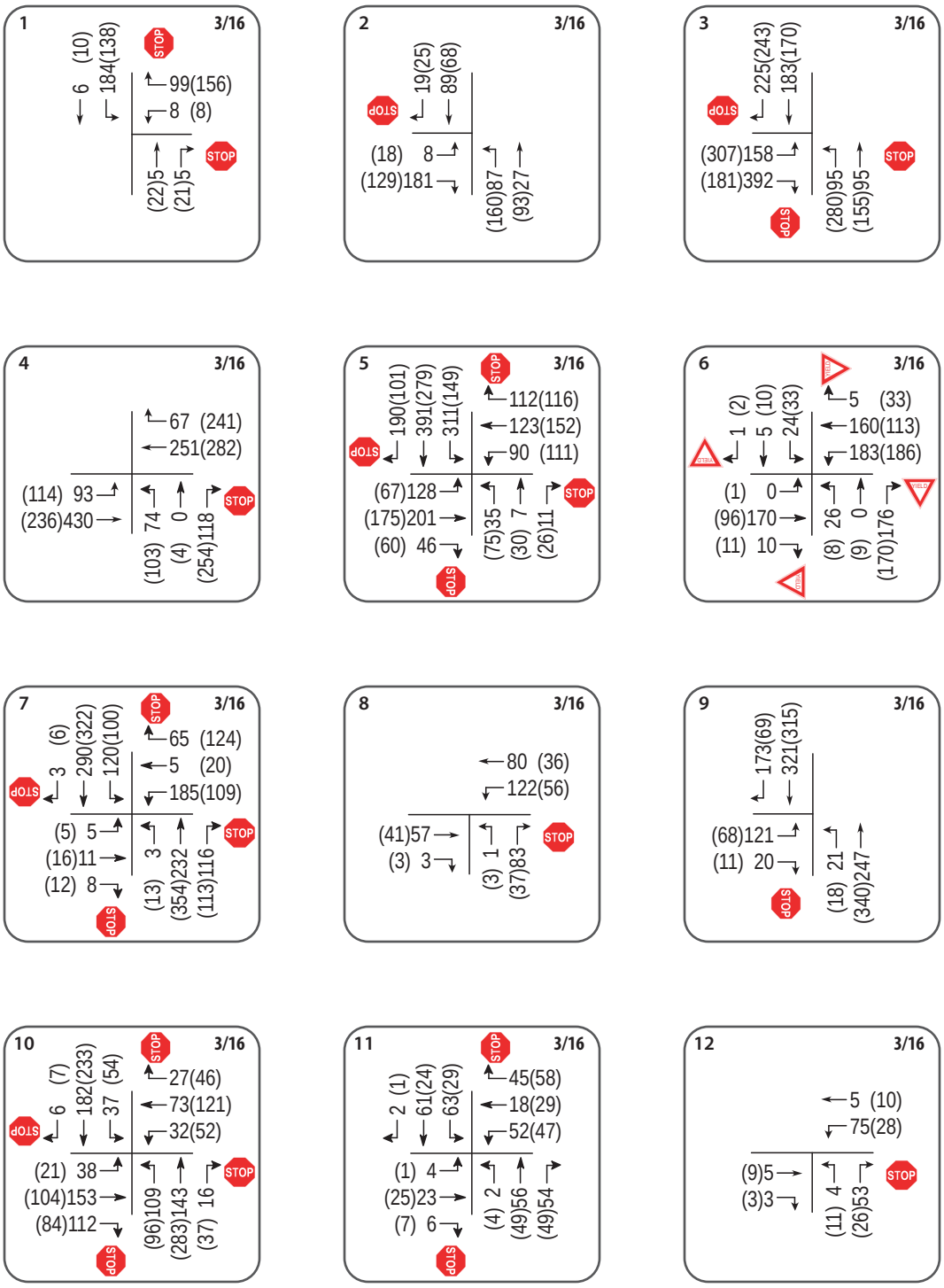

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Figure 3 – Existing Traffic Volumes

Table 4 – Existing Peak Hour Intersection Levels of Service

Study Intersection *Approach*	AM Peak		PM Peak	
	Delay	**LOS**	**Delay**	**LOS**
1. St. Louis Rd/US 101 Overpass	3.4	A	5.4	A
Northbound St. Louis Rd Approach	*9.8*	*A*	*9.6*	*A*
Westbound Overpass Approach	*9.0*	*A*	*9.2*	*A*
2. LK Wood Blvd/US 101 Overpass	3.2	A	2.5	A
Southbound LK Wood Blvd Approach	*11.4*	*B*	*11.7*	*B*
3. Sunset Ave/LK Wood Blvd	13.3	B	**36.3**	**E**
4. Sunset Ave/US 101 N Ramps	5.3	A	8.7	A
Northbound US 101 N Off-ramp Approach	*24.3*	*C*	*27.0*	*D*
5. Sunset Ave/US 101 S Ramps-G/H Streets	14.2	B	11.4	B
6. Sunset Ave/Foster Ave-Jay St	5.0	A	4.4	A
7. Foster Ave/Alliance Rd	18.0	C	23.9	C
8. 17th St/Q St	4.9	A	4.3	A
Northbound Q St Approach	*9.1*	*A*	*8.8*	*A*
9. 17th St/Alliance Rd	3.3	A	1.7	A
Eastbound 17th St Approach	*19.6*	*C*	*16.2*	*C*
10. 11th St/K St	14.0	B	20.0	C
11. 11th St/Janes Rd	5.5	A	6.0	A
Eastbound 11th St Approach	*11.4*	*B*	*10.3*	*B*
Westbound 11th St Approach	*11.0*	*B*	*10.0*	*B*
12. Foster Ave/Janes Rd	7.2	A	6.1	A
Northbound Janes Rd Approach	*8.7*	*A*	*8.7*	*A*

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*; **Bold** text = below desired threshold; Shaded cells = conditions with recommended improvements

Finding – Though vehicular operation at Sunset Avenue/LK Wood Boulevard falls below the desired threshold of LOS C, potential improvements that would increase vehicular capacity and reduce delay were determined to have a deleterious effect on pedestrian and bicycle traffic, so such improvements were rejected by representatives of Humboldt State University. Under the criterion applied, the existing LOS E operation is therefore deemed acceptable for this location.

Future Conditions

Future traffic volumes were developed using an assumed growth rate of 1.5 percent per year to a horizon year of 2036, or 20 years out. No changes to the infrastructure or transportation system were assumed for this scenario. Under the estimated Future volumes, three of the study intersections are expected to operate unacceptably during one or both peak periods. Sunset Avenue/LK Wood Boulevard, which was identified as operating unacceptably during the p.m. peak hour under current traffic volumes, would experience increased delay, and Sunset Avenue/US 101 North Ramps is expected to deteriorate to LOS D overall during this time period. The intersection of Foster Avenue/Alliance Road is expected to operate unacceptably during both peak periods and

11th Street/K Street during the p.m. peak hour with the increased volumes. Future operating conditions are summarized in Table 5 and volumes are shown in Figure 4.

Table 5 – Future (without Projects) Peak Hour Intersection Levels of Service

Study Intersection *Approach*	AM Peak		PM Peak	
	Delay	**LOS**	**Delay**	**LOS**
1. St. Louis Rd/US 101 Overpass	3.5	A	5.6	A
Northbound St. Louis Rd Approach	*10.1*	*B*	*9.9*	*A*
Westbound Overpass Approach	*9.1*	*A*	*9.4*	*A*
2. LK Wood Blvd/US 101 Overpass	3.5	A	2.8	A
Southbound LK Wood Approach	*12.7*	*B*	*13.1*	*B*
3. Sunset Ave/LK Wood Blvd	17.1	C	**88.0**	**F**
Roundabout – Intersections 3 and 4	10.6	B	19.8	C
4. Sunset Ave/US 101 N Ramps	10.4	B	**28.5**	**D**
Northbound US 101 N Off-ramp Approach	*51.6*	*F*	*94.4*	*F*
5. Sunset Ave/US 101 S Ramps-G/H Streets	20.1	C	13.0	B
6. Sunset Ave/Foster Ave-Jay St	5.7	A	5.2	A
7. Foster Ave/Alliance Rd	**38.4**	**E**	**67.4**	**F**
Roundabout	8.4	A	9.0	A
8. 17th St/Q St	5.0	A	4.4	A
Northbound Q St Approach	*9.3*	*A*	*8.9*	*A*
9. 17th St/Alliance Rd	5.0	A	2.43	A
Eastbound 17th St Approach	*30.8*	*D*	*23.2*	*C*
10. 11th St/K St	22.43	C	**73.6**	**F**
11. 11th St/Janes Rd	5.9	A	6.2	A
Eastbound 11th St Approach	*12.3*	*B*	*10.7*	*B*
Westbound 11th St Approach	*11.9*	*B*	*10.4*	*B*
12. Foster Ave/Janes Rd	7.2	A	6.1	A
Northbound Janes Rd Approach	*8.7*	*A*	*8.8*	*A*

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text = below desired threshold; Shaded cells = conditions with recommended improvements

Since the two intersections at LK Wood Boulevard/Sunset Avenue and Sunset Avenue/US 101 North Ramps are in close proximity, it is recommended that long-term any improvements to one of the intersections include the other. Because the City of Arcata does not have signals and given the large right of way, a five-legged roundabout that combines the two intersections was considered. In evaluating the potential configuration of such a roundabout, it was determined that it would only be feasible if the existing connection from G Street to the US 101 North Off-ramp were closed. Because the counts at the intersection did not indicate which vehicles came from the off-ramp versus the overpass, it is unknown what volume this link carries. However, because of the short distance between the merge and the intersection, it appears that this movement cannot be accommodated while still achieving adequate deflection and separation for each of the five approaches. While the diverted traffic was not estimated, it is noted that the added vehicles would make a right turn at Sunset Avenue/US 101 S Ramps-G/H Streets; this

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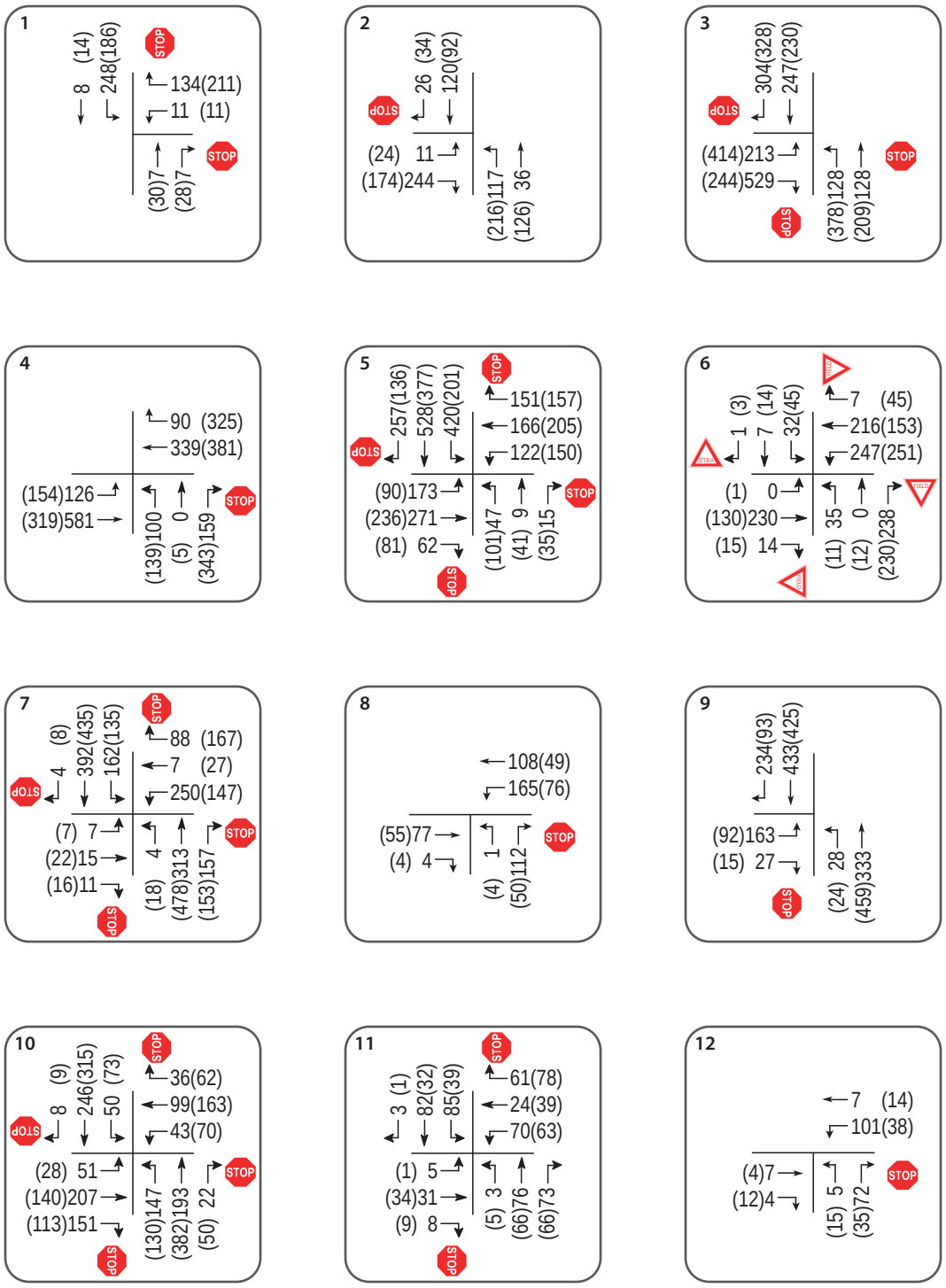

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Figure 4 – Future Traffic Volumes

movement is a low-delay movement and it would be added to an intersection already projected to operate at LOS C or B during the morning and evening peaks respectively. As a result, it is anticipated that the diversion would have a minimal impact on operation.

It was further determined that, given the extensive right-of-way available both at the intersection and across the overpass, it would be possible to include a separated bikeway, or cycle track, on the south side of Sunset Avenue between LK Wood Boulevard and US 101 South Ramps-G/H Streets. These potential improvements are shown in Figures 5 and 6.

In addition to the roundabout on Sunset Avenue at US 101 North and LK Wood Boulevard, additional capacity will be needed at Foster Avenue/Alliance Road. To achieve acceptable LOS C operation, a roundabout would be needed at this location as well. There is limited right-of-way available at this intersection, so use of a mini-roundabout was tested. This would provide the benefits of a roundabout in terms of operation, but requires a fully-mountable center island to accommodate large vehicles, including fire trucks. A conceptual layout of the mini-roundabout is provided in Figure 7.

Finally, under the projected future volumes, the intersection at 11th Street/K Street would need increased vehicular capacity to operate at LOS C. Vehicular capacity can be increased by re-striping the intersection to add turn lanes on each of the four approaches. However, it is noted that this will require additional right-of-way to accommodate truck turning radii and the elimination of a short segment of the bike lane and/or on-street parking on both sides of each approach. The City has identified that a lower service level is acceptable if the improvements would deteriorate operation for pedestrians and bicyclists. Because no feasible modifications were identified that would improve vehicular operation without deteriorating conditions for pedestrians and bicycles, no improvements are recommended, nor are they needed under the criteria applied.

Project Description

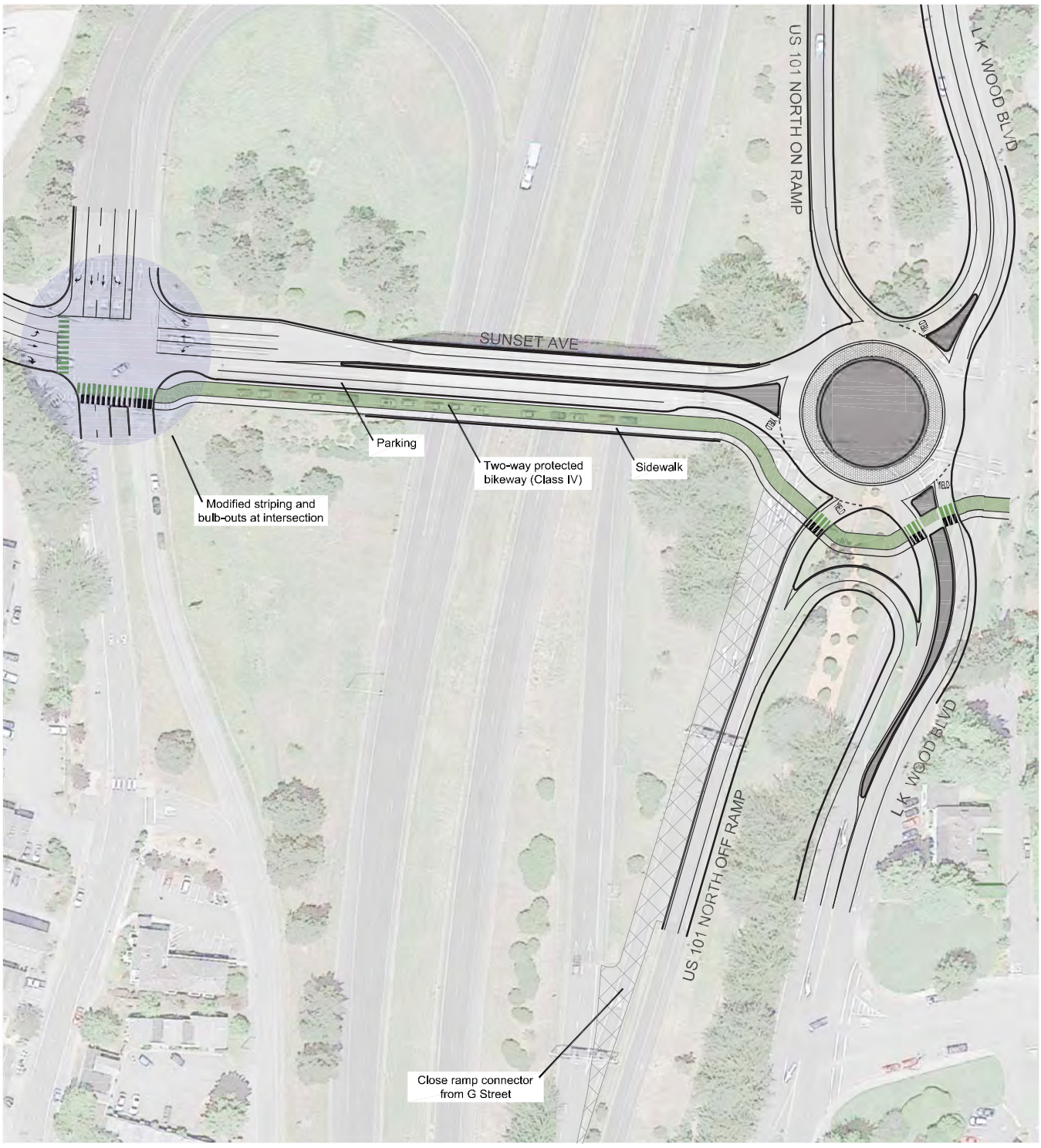
Six individual projects were evaluated to assess impacts areawide in Central Arcata. Following are the projects and the components included in each.

1. **The Village** – 240 apartment units housing a combined total of 800 beds for university students.
2. **Canyon Creek** – 74 apartments
3. **Sunset Terrace** – 142 apartments
4. **Open Door Community Health Center** – 30,000 square-foot medical office
5. **Twin Parks Apartment** – 40 apartments
6. **Creekside** – 67 single family dwellings with potential for 32 additional homes as "granny units" (for a total of 89 total units) and a 100-bed assisted living facility

Trip Generation

The anticipated trip generations for the various projects were estimated using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual*, 9th Edition, 2012. The Village, Canyon Creek, Sunset Terrace, and Twin Parks projects were evaluated using the trip generation rates for "Apartments" (ITE LU#220). In all cases, the fitted curve equation for the trip generation rate was applied; hence, the rates vary slightly from one project to another depending on their size. The Open Door Community Health Center was treated as a "Medical-Dental Office" based on rates for ITE LU#720. The Creekside project was evaluated using the rates for "Single Family Detached Housing" (ITE LU#210) for the homes and "Assisted Living" (ITE LU#254) for the 100-bed facility.

It is noted that consideration was given to what rate would be appropriate for the Village project since it is not strictly apartment units. There are no standard rates for a student dormitory, but data was obtained from a study



North

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Figure 5 – Conceptual Modifications near Sunset Avenue Interchange

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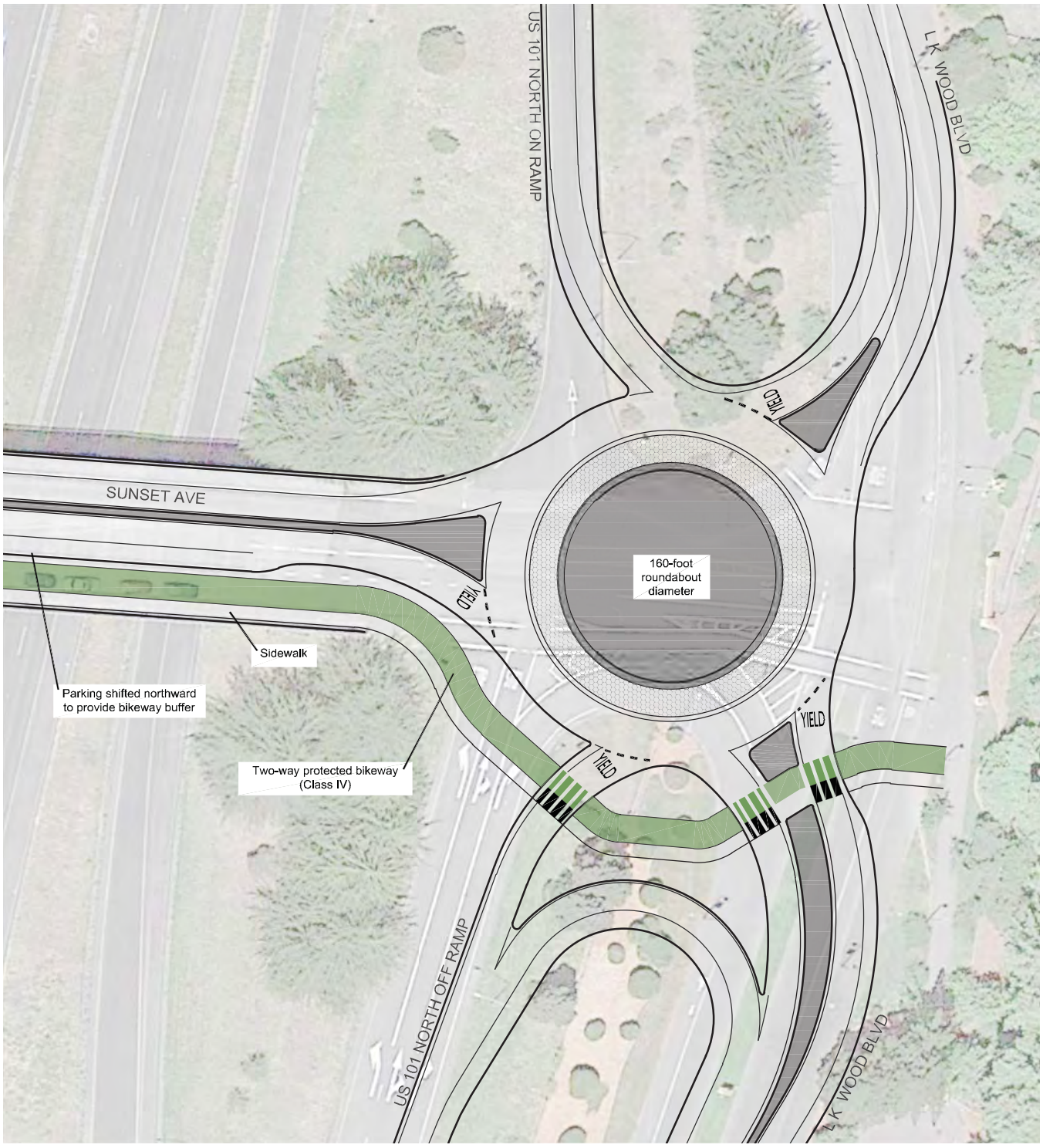

North

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Figure 6 – Conceptual Roundabout at Sunset Avenue/US 101N Ramps/LK Wood Boulevard

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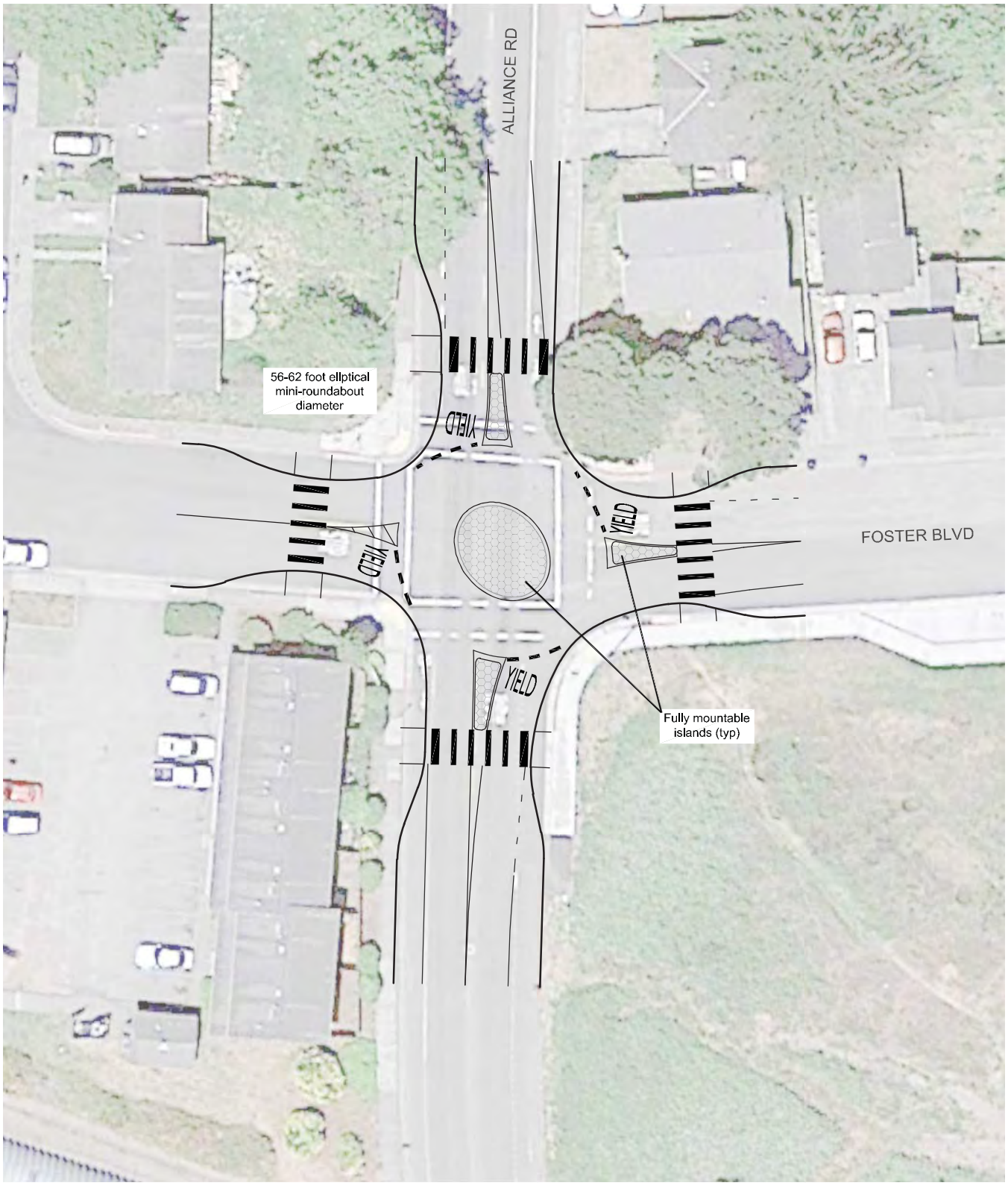

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Central Arcata Areawide Traffic Impact Study

Figure 7 – Conceptual Mini-Roundabout at Foster Avenue/Alliance Road

at Princeton University indicating the number of trips on a per-bed basis. A comparison was made between application of the rates from this study to an 800-bed facility and the standard ITE rates for a 240-unit apartment complex, and it was determined that the results using the ITE rates were similar, though slightly higher. Since this provided a rate that was both standard and conservative, these rates were applied.

Total Project Trip Generation

The expected trip generation potentials for each of the six proposed or potential projects are indicated in Table 6. Though the Village site is currently occupied, no deduction was taken as this site currently generates a minimal volume of trips. These new trips represent the increase in traffic associated with the projects compared to existing volumes.

Table 6 – Trip Generation Summary

Land Use	Units	Daily		AM Peak Hour				PM Peak Hour			
		Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out
The Village											
Apartments	240 du	6.57	1,578	0.51	121	24	97	0.62	150	97	53
Canyon Creek											
Apartments	74 du	7.73	572	0.54	40	8	32	0.79	58	38	20
Open Door											
Medical Office	30 ksf	36.13	1,084	2.39	72	57	15	3.57	107	30	77
Sunset Terrace											
Apartments	142 du	6.93	984	0.52	73	15	58	0.67	96	62	34
Twin Parks											
Apartments	40 du	9.15	366	0.58	23	5	18	0.99	40	26	14
Creekside											
Single Family	89 du	9.52	847	0.75	67	17	50	1.00	89	56	33
Assisted Living	100 beds	2.66	266	0.14	14	9	5	0.22	22	10	12
Total			**5,697**		**410**	**135**	**275**		**562**	**319**	**243**

Note: du = dwelling unit; ksf = 1,000 square feet

Trip Distribution

The pattern used to allocate new project trips to the street network was based on data from the 2000 Census for home-to-work or work-to-home trips as well as approach volumes at the various study intersections. The applied distribution assumptions for individual projects are shown in Table 7.

Table 7 – Trip Distribution Assumptions						
Routes	**Projects**					
	Apts*	**Twin Parks**	**Village**	**Open Door**	**Creekside**	
					Asst. Living	**SFD****
To/from Humboldt State	25%	20%	75%	-	-	5%
To/from south on US 101	25%	20%	10%	15%	30%	30%
To/from south on G-H	15%	10%	-	25%	15%	10%
To/from south on Alliance	15%	20%	15%	25%	20%	20%
To/from north on US 101	10%	10%	-	10%	10%	10%
To/from north on Alliance	10%	20%	-	15%	25%	20%
To/from east of US 101	-	-	-	5%	-	-
To/from surrounding neighborhood	-	-	-	5%		
To/from south on Janes	-	-	-	-	-	5%
TOTAL	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Notes: * Canyon Creek and Sunset Terrace; ** Single Family Dwellings

Intersection Operation

Existing plus Project Conditions

Conditions were evaluated with each of the six projects added individually to the existing volumes as well as with all six added to existing volumes.

Existing plus The Village

Upon the addition of traffic related to the Village project to the Existing volumes, the study intersection of Alliance Road/Foster Avenue would fall to an unacceptable level of service. All other study intersections, except LK Wood Boulevard/Sunset Avenue, which currently operates unacceptably at LOS E during the evening peak hour, would continue to operate at acceptable levels of service. Project traffic volumes are shown in Figure 8 and the resulting levels of service are summarized in Table 8.

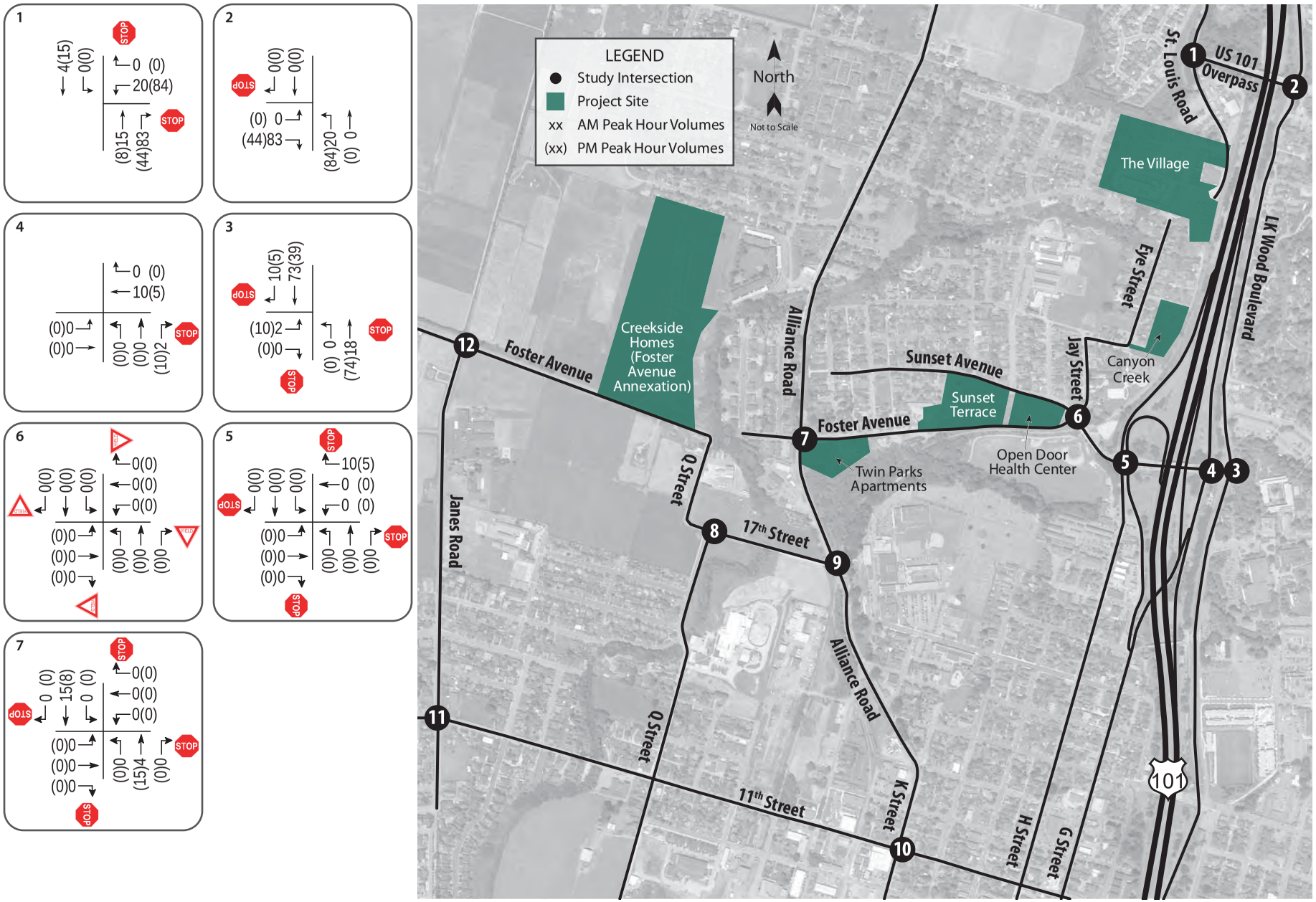

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Figure 8 – The Village Project Traffic Volumes

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Table 8 – Existing plus The Village Peak Hour Intersection Levels of Service				
Study Intersection *Approach*	**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**
1. St. Louis Rd/US 101 Overpass	5.3	A	6.9	A
Northbound St. Louis Rd Approach	*10.0*	*B*	*9.7*	*A*
Westbound Overpass Approach	*9.4*	*A*	*10.44*	*B*
2. LK Wood Blvd/US 101 Overpass	2.8	A	2.2	A
Southbound LK Wood Approach	*12.5*	*B*	*13.1*	*B*
3. Sunset Ave/LK Wood Blvd	15.1	B	**58.9**	**F**
4. Sunset Ave/US 101 N Ramps	5.3	A	8.8	A
Northbound US 101 N Off-ramp Approach	*24.6*	*C*	*26.9*	*D*
5. Sunset Ave/US 101 S Ramps-G/H Streets	14.6	B	11.4	B
6. Sunset Ave/Foster Ave-Jay St	5.0	A	4.4	A
7. Foster Ave/Alliance Rd	19.0	C	**26.0**	**D**
Restripe Alliance Road Approaches	14.0	B	17.7	C

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text = operation below desired threshold; Shaded cells = conditions with recommended improvements

It is noted that with the addition of project-related traffic volumes, average delay at the LK Wood Blvd/US 101 Overpass intersection decreases during both the a.m. and p.m. peak hours. While this is counter-intuitive, this condition occurs when a project adds trips to movements that have delays that are below the intersection average, resulting in a better balance between approaches and lower overall average delay. The project adds traffic to the through movement, which has an average delay that is lower than the average for the intersection as a whole, resulting in a slight reduction in the overall average delay. The conclusion could incorrectly be drawn that the project actually improves operation based on this data alone; however, it is more appropriate to conclude that the project trips are expected to make use of excess capacity, so drivers will experience little, if any, change in conditions as a result of the project.

Upon the addition of the project trips to the study intersection Foster Avenue/Alliance Road, the service level falls to a deficient LOS D. To mitigate the impact the intersection should be restriped to include turn lanes on the Alliance Road approaches, a right turn lane on the northbound approach and a left-turn lane on the southbound approach.

Finding – Five study intersections would continue operating acceptably upon the addition of traffic from The Village project. While Sunset Avenue/LK Wood Boulevard is projected to operate at LOS F, as indicated in the discussion of existing conditions, no improvements were identified that would not degrade pedestrian and bicyclists access and safety, so the lower service level is considered acceptable. The project results in deterioration of operation during the p.m. peak hour at Foster Avenue/Alliance Road to LOS D.

Recommendation – To achieve acceptable operation at Foster Avenue/Alliance Road, as part of the project the Alliance Road approaches should be restriped to provide left-turn and through/right-turn lanes southbound and a right-turn lane and left-turn/through lane on the northbound approach. This is a project-specific recommendation that should be completed by the first project to be constructed. A conceptual striping plan is provided in Figure 9.

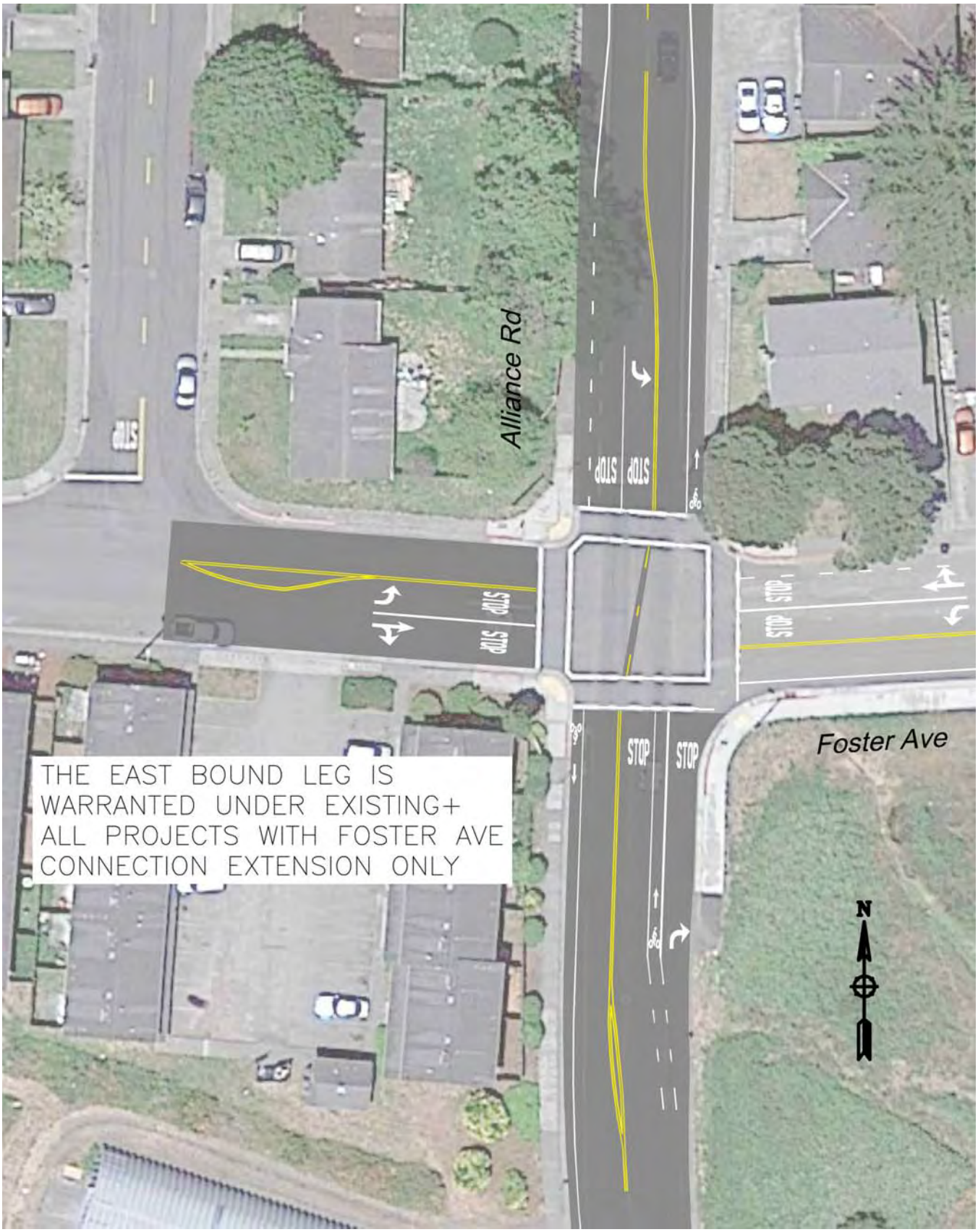

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Figure 9 – Conceptual Striping Recommendation for Foster Avenue/Alliance Road

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Existing plus Canyon Creek

Upon the addition of traffic related to the Canyon Creek project to the Existing volumes, the study intersection of Alliance Road/Foster Avenue passes the acceptable threshold to LOS D. All other study intersections, with the exception of LK Wood Boulevard/Sunset Avenue, would continue to operate at acceptable levels of service. These results are summarized in Table 9 with project traffic volumes are shown in Figure 10.

Table 9 – Existing plus Canyon Creek Peak Hour Intersection Levels of Service

	Study Intersection *Approach*	**AM Peak**		**PM Peak**	
		Delay	**LOS**	**Delay**	**LOS**
1.	St. Louis Rd/US 101 Overpass	3.4	A	5.4	A
	Northbound St. Louis Rd Approach	*9.8*	*A*	*9.6*	*A*
	Westbound Overpass Approach	*9.0*	*A*	*9.2*	*A*
2.	LK Wood Blvd/US 101 Overpass	3.2	A	2.5	A
	Southbound LK Wood Approach	*11.4*	*B*	*11.7*	*B*
3.	Sunset Ave/LK Wood Blvd	13.4	B	**37.8**	**E**
4.	Sunset Ave/US 101 N Ramps	5.5	A	10.4	B
	Northbound US 101 N Off-ramp Approach	*25.8*	*D*	*32.6*	*D*
5.	Sunset Ave/US 101 S Ramps-G/H Streets	14.4	B	11.6	B
6.	Sunset Ave/Foster Ave-Jay St	5.1	A	4.6	A
7.	Foster Ave/Alliance Rd	18.3	C	**25.0**	**D**
	Restripe Alliance Road Approaches	13.8	B	16.9	C

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text = operation below desired threshold; Shaded cells = conditions with recommended improvements

Finding – Five of the seven study intersections would continue operating acceptably upon the addition of traffic from the Sunset Terrace project. The higher delays have been deemed acceptable at Sunset Avenue/LK Wood Boulevard due to conflicts between potential improvements and pedestrian/bicycle access. The project results in deterioration of operation during the p.m. peak hour at Foster Avenue/ Alliance Road to LOS D.

Recommendation – Foster Avenue/Alliance Road should be restriped to provide left-turn and through/right-turn lanes southbound and a right-turn lane and left-turn/through lane on the northbound approach as part of the project, if not already completed as part of another project, as shown in Figure 9.

Existing plus Sunset Terrace

Upon the addition of traffic related to the Sunset Terrace project to the Existing volumes, the study intersection of Alliance Road/Foster Avenue falls to an unacceptable level of service. All other study intersections, with the exception of LK Wood Boulevard/Sunset Avenue, would continue to operate at acceptable levels of service. Project traffic volumes are shown in Figure 11 and the resulting levels of service are summarized in Table 10.

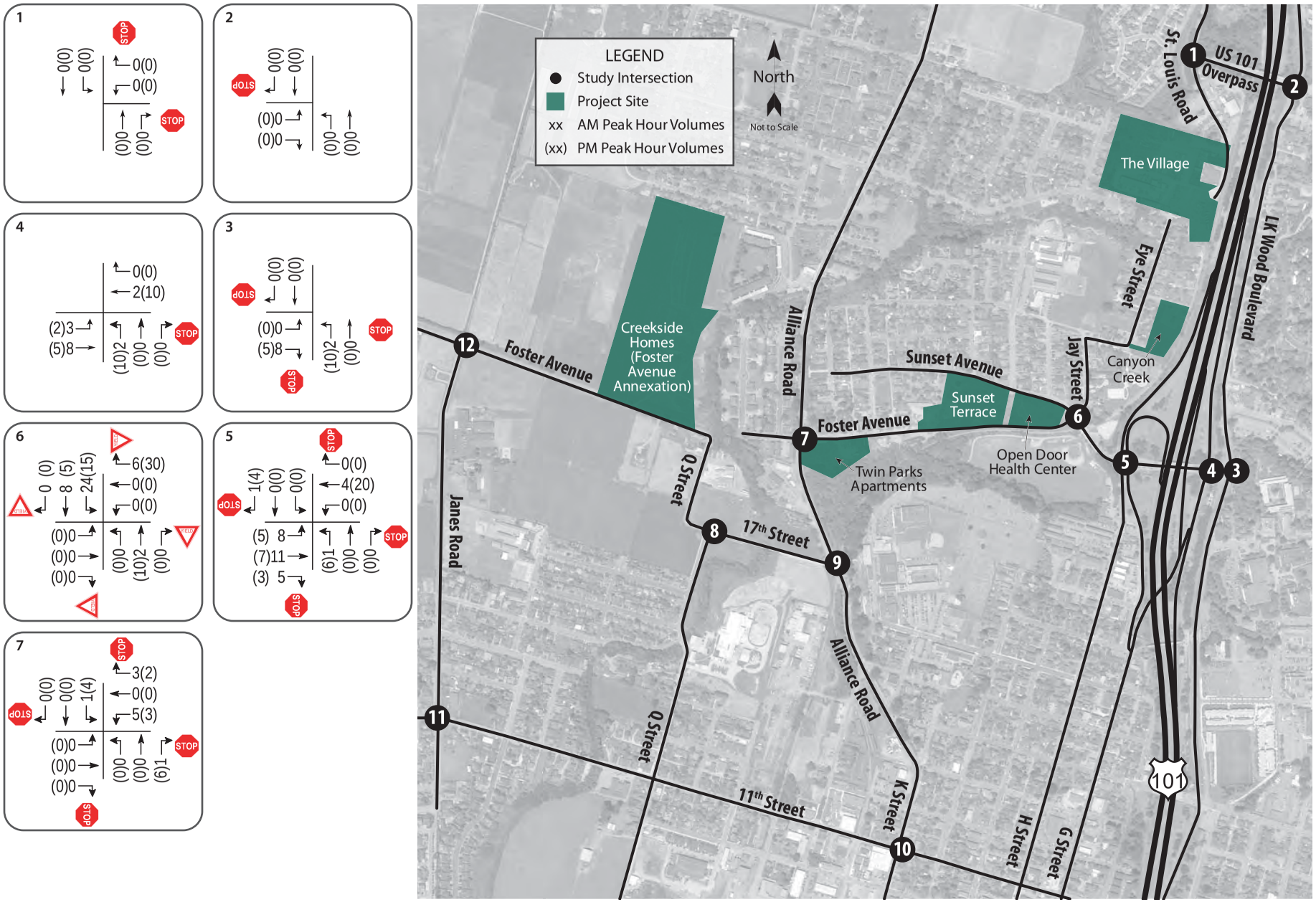

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Figure 10 – Canyon Creek Project Traffic Volumes

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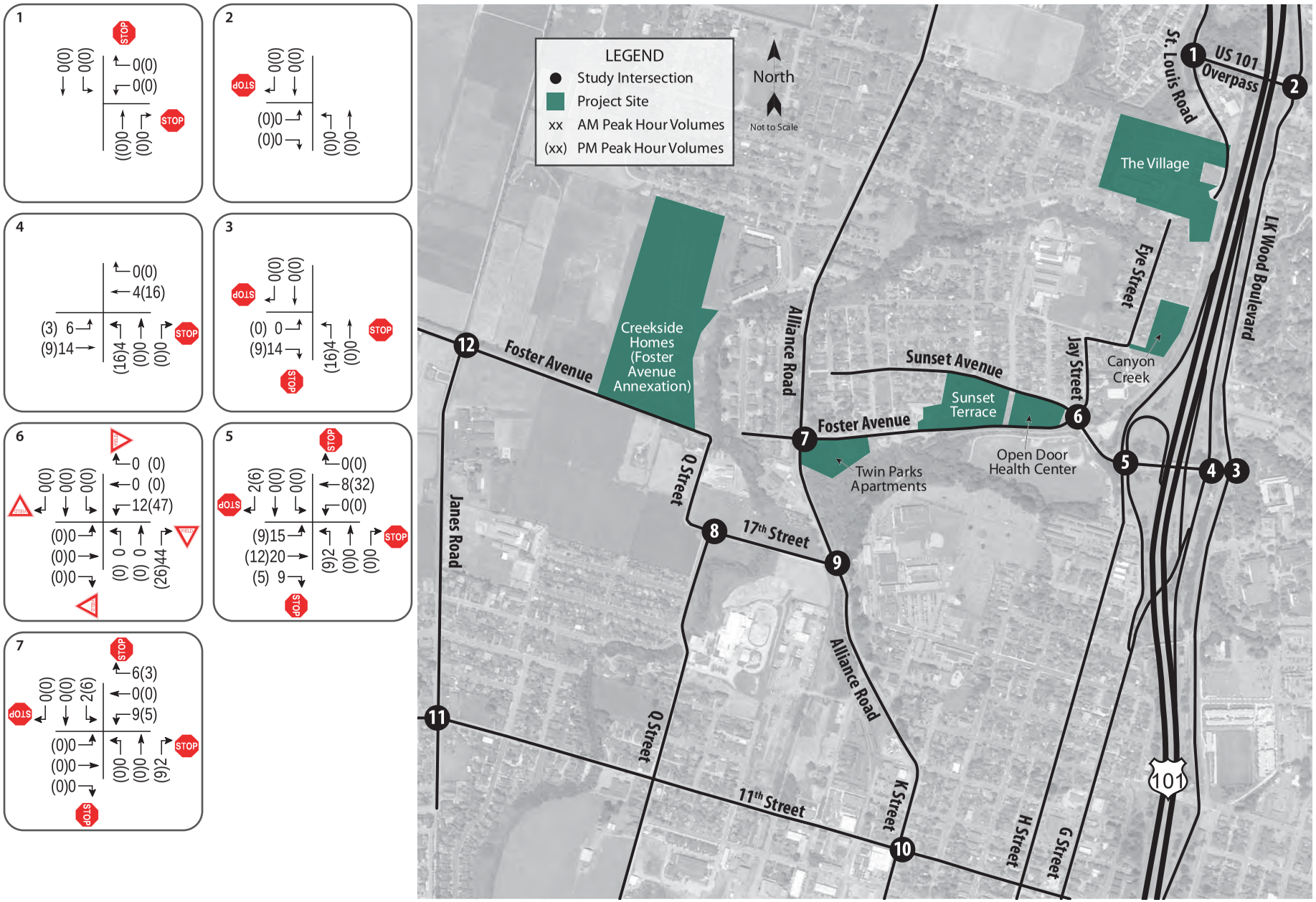

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Figure 11 – Sunset Terrace Project Traffic Volumes

Table 10 – Existing plus Sunset Terrace Peak Hour Intersection Levels of Service					
Study Intersection ***Approach***		**AM Peak**		**PM Peak**	
		Delay	**LOS**	**Delay**	**LOS**
1.	St. Louis Rd/US 101 Overpass	3.4	A	5.4	A
	Northbound St. Louis Rd Approach	*9.8*	*A*	*9.6*	*A*
	Westbound Overpass Approach	*9.0*	*A*	*9.2*	*A*
2.	LK Wood Blvd/US 101 Overpass	3.2	A	2.5	A
	Southbound LK Wood Approach	*11.4*	*B*	*11.7*	*B*
3.	Sunset Ave/LK Wood Blvd	13.4	B	**39.2**	**E**
4.	Sunset Ave/US 101 N Ramps	5.9	A	11.7	B
	Northbound US 101 N Off-ramp Approach	*27.4*	*D*	*37.0*	*E*
5.	Sunset Ave/US 101 S Ramps-G/H Streets	14.6	B	11.7	B
6.	Sunset Ave/Foster Ave-Jay St	5.2	A	4.7	A
7.	Foster Ave/Alliance Rd	18.6	C	**25.5**	**D**
	Restripe Alliance Road Approaches	13.9	B	17.0	C

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text = operation below desired threshold; Shaded cells = conditions with recommended improvements

Finding – Five of the seven study intersections would continue operating acceptably upon the addition of traffic from the Sunset Terrace project. No improvements are recommended for Sunset Avenue/LK Wood Boulevard, as LOS E operation was deemed acceptable to avoid negative impacts to pedestrian and bicyclist safety. The project results in deterioration of operation during the p.m. peak hour at Foster Avenue/Alliance Road to LOS D.

Recommendation – Foster Avenue/Alliance Road should be restriped to provide left-turn and through/right-turn lanes southbound and a right-turn lane and left-turn/through lane on the northbound approach as shown in Figure 9 as part of the project, if not already completed as part of another project.

Existing plus Open Door Health Center

With the addition of traffic related to the Open Door Health Center to the Existing volumes, the study intersection of Alliance Road/Foster Avenue falls to an unacceptable service level. All other study intersections, with the exception of LK Wood Boulevard/Sunset Avenue, which currently operates below the desired threshold of LOS C, would maintain acceptable levels of service. Project traffic volumes are shown in Figure 12 and the resulting levels of service are summarized in Table 11.

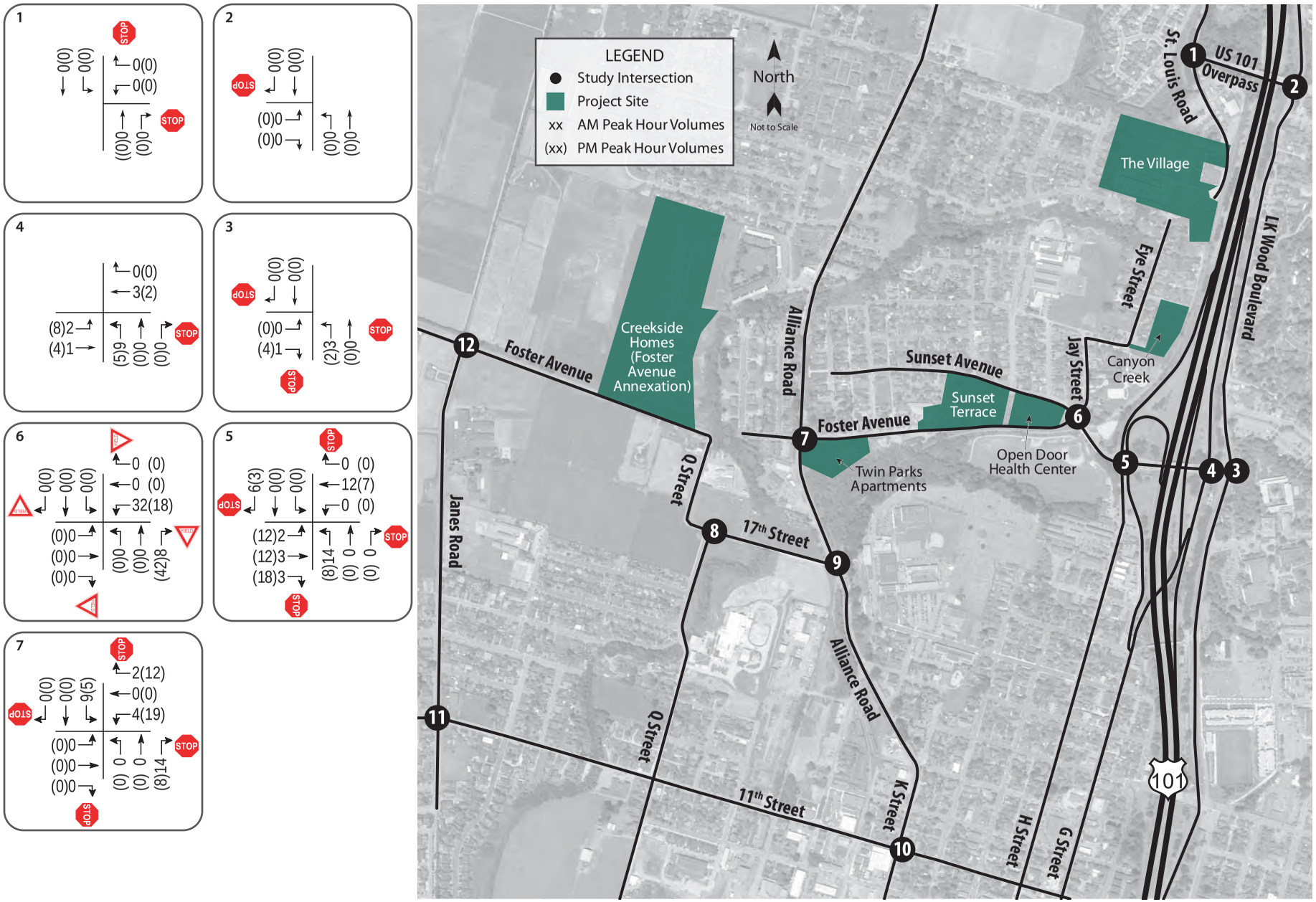

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Figure 12 – Open Door Health Center Project Traffic Volumes

Table 11 – Existing plus Open Door Health Center Peak Hour Intersection Levels of Service					
Study Intersection ***Approach***		**AM Peak**		**PM Peak**	
		Delay	**LOS**	**Delay**	**LOS**
1.	St. Louis Rd/US 101 Overpass	3.4	A	5.4	A
	Northbound St. Louis Rd Approach	*9.8*	*A*	*9.6*	*A*
	Westbound Overpass Approach	*9.0*	*A*	*9.2*	*A*
2.	LK Wood Blvd/US 101 Overpass	3.2	A	2.5	A
	Southbound LK Wood Approach	*11.4*	*B*	*11.7*	*B*
3.	Sunset Ave/LK Wood Blvd	13.3	B	**35.9**	E
4.	Sunset Ave/US 101 N Ramps	6.0	A	10.0	B
	Northbound US 101 N Off-ramp Approach	*27.5*	*D*	*31.0*	*D*
5.	Sunset Ave/US 101 S Ramps-G/H Streets	14.4	B	11.5	B
6.	Sunset Ave/Foster Ave-Jay St	5.2	A	4.6	B
7.	Foster Ave/Alliance Rd	19.1	C	**26.7**	**D**
	Restripe Alliance Road Approaches	13.8	B	17.6	C

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text = operation below desired threshold; Shaded cells = conditions with recommended improvements

Finding – Five of the seven study intersections would continue operating acceptably upon the addition of traffic from the Open Door Health project. Sunset Avenue/LK Wood Boulevard is considered as operating acceptably, as discussed previously. The project results in deterioration of operation during the p.m. peak hour at Foster Avenue/ Alliance Road to LOS D.

Recommendation – As shown in Figure 9, Foster Avenue/Alliance Road should be restriped to provide left-turn and through/right-turn lanes southbound and a right-turn lane and left-turn/through lane on the northbound approach as part of the project, if not already completed as part of another project.

Existing plus Twin Parks

With the addition of traffic related to the Twin Parks project to the Existing volumes, all the study intersections, with the exception of LK Wood Boulevard/Sunset Avenue, would continue to operate at acceptable service levels. Project traffic volumes are shown in Figure 13 and the resulting levels of service are summarized in Table 12.

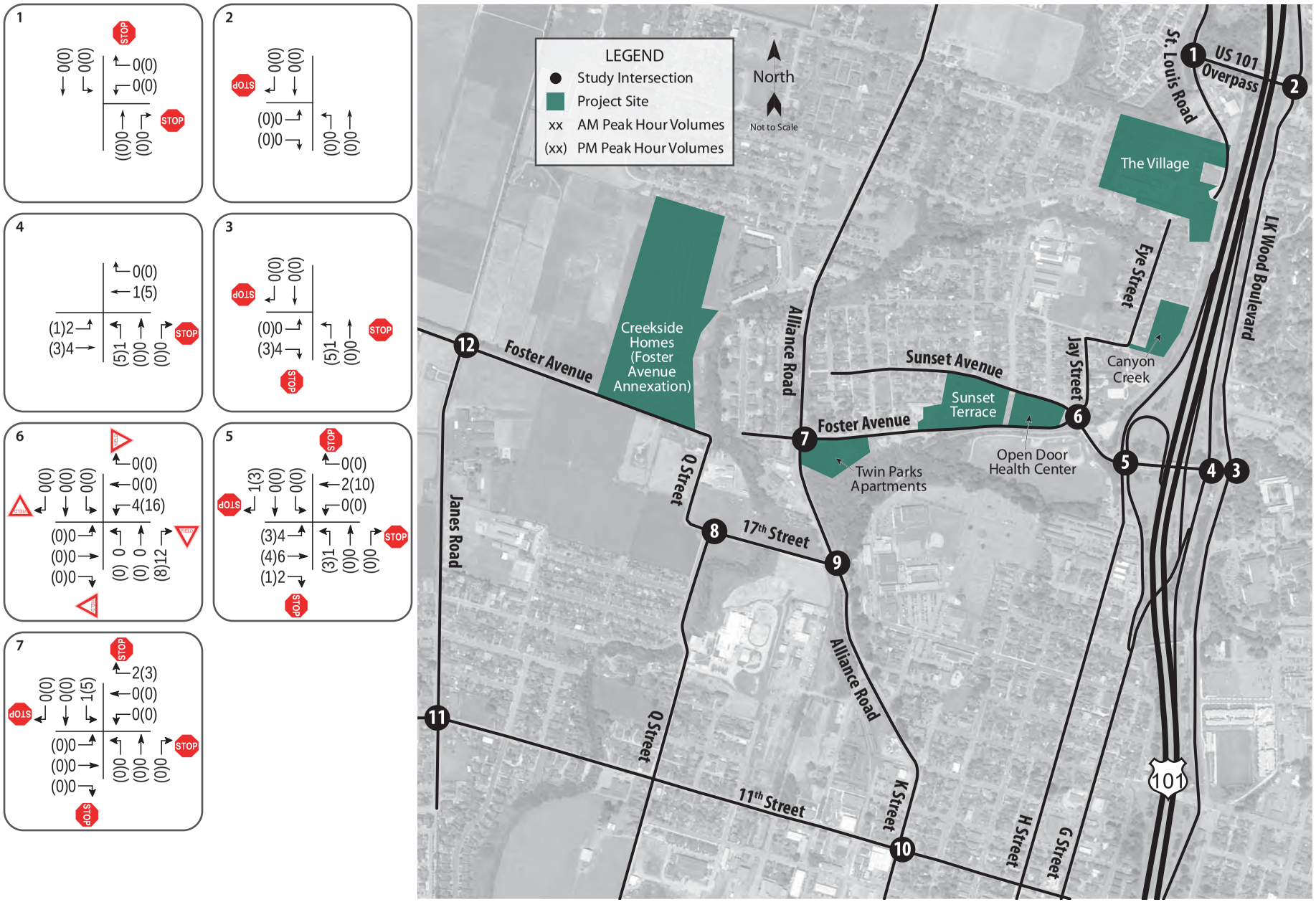

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Figure 13 – Twin Parks Project Traffic Volumes

Table 12 – Existing plus Twin Parks Peak Hour Intersection Levels of Service				
Study Intersection *Approach*	**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**
1. St. Louis Rd/US 101 Overpass	3.4	A	5.4	A
Northbound St. Louis Rd Approach	*9.8*	*A*	*9.6*	*A*
Westbound Overpass Approach	*9.0*	*A*	*9.2*	*A*
2. LK Wood Blvd/US 101 Overpass	3.2	A	2.5	A
Southbound LK Wood Approach	*11.4*	*B*	*11.7*	*B*
3. Sunset Ave/LK Wood Blvd	13.3	B	**36.5**	**E**
4. Sunset Ave/US 101 N Ramps	5.4	A	9.5	A
Northbound US 101 N Off-ramp Approach	*25.1*	*D*	*29.6*	*D*
5. Sunset Ave/US 101 S Ramps-G/H Streets	14.3	B	11.5	B
6. Sunset Ave/Foster Ave-Jay St	5.0	A	4..5	A
7. Foster Ave/Alliance Rd	18.1	C	24.4	C

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text = operation below desired threshold; Shaded cells = conditions with recommended improvements

Finding – All of the study intersections would continue operating acceptably upon the addition of traffic from the Twin Parks project. No changes are proposed at Sunset Avenue/LK Wood Boulevard due to conflicts between potential improvements and access for pedestrians and bicyclists.

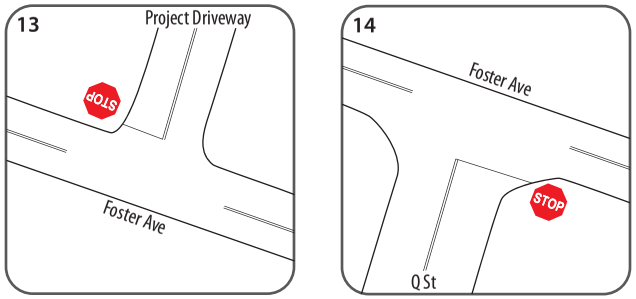
Existing plus Creekside Homes

Two access alternatives were analyzed for the Creekside Homes project. In addition to using the existing street system, an alternative was evaluated that includes the connection of Foster Avenue west of Alliance Road and east of Q Street, where the McDaniel Slough, or Janes Creek, divides the existing road. For this project only, there are additional study intersections, including Foster Avenue/Project Driveway. In the alternative analysis with the Foster Avenue connection, the intersection of Foster Avenue/Q Street is added to the analysis. Figure 14 shows the locations and assumed lane configurations for the two new intersections.

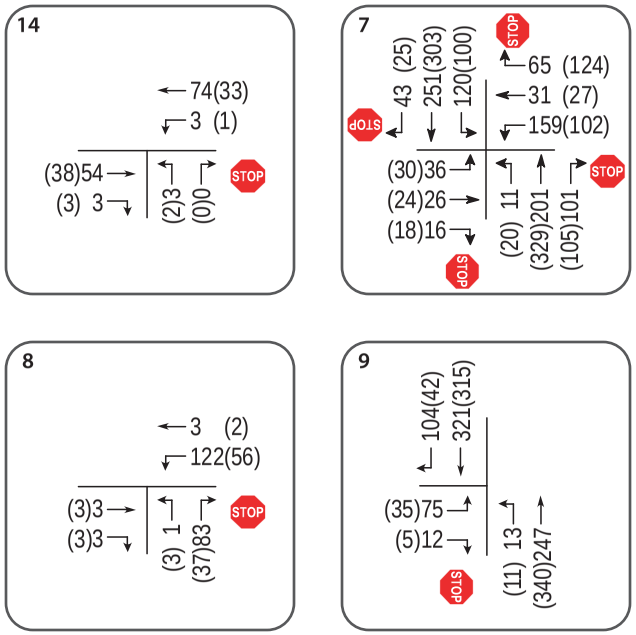
Existing Roadways Configuration

Upon the addition of traffic related to the Creekside Homes project to Existing volumes, the study intersections of Alliance Road/Foster Avenue and 11th Street/K Street fall to unacceptable service levels. All other study intersections, with the exception of LK Wood Boulevard/Sunset Avenue, would continue to operate at acceptable levels of service. Project traffic volumes are shown in Figure 15 and the resulting levels of service are summarized in Table 13.

New Intersections



Changes to Existing Volumes



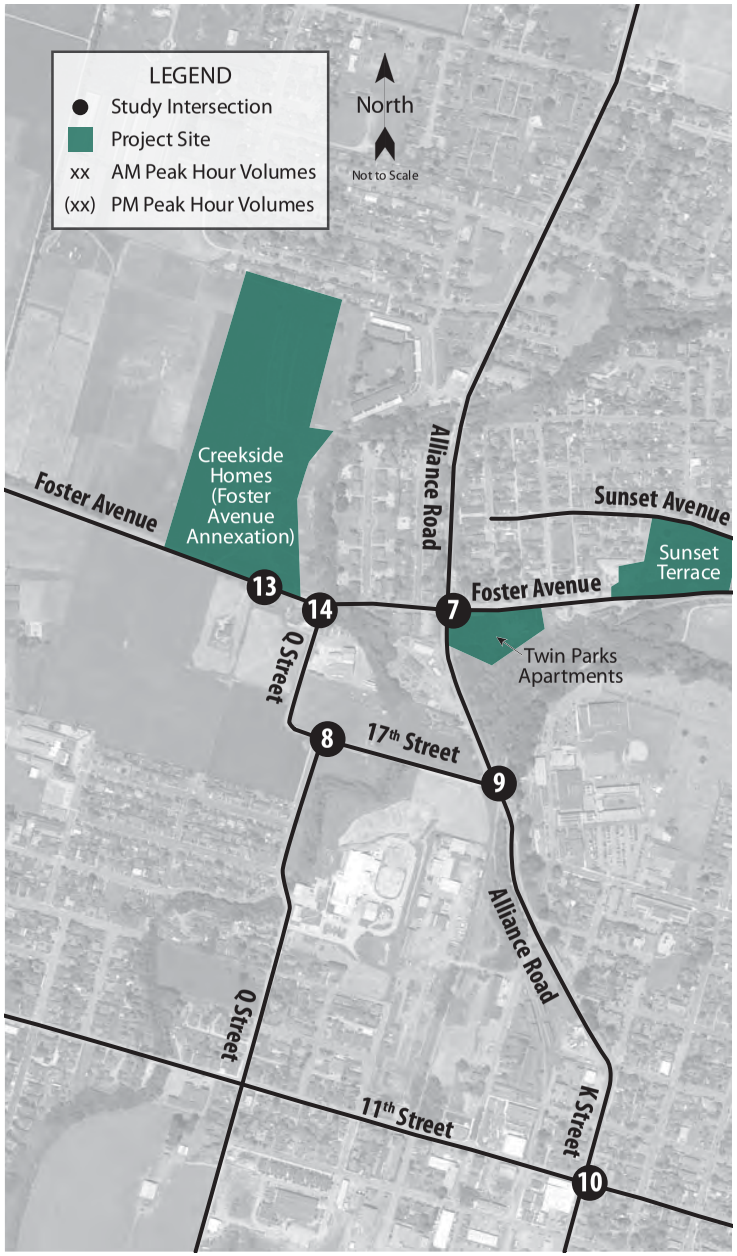


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Figure 14 – Foster Avenue Extension: New Intersections and Changes to Existing Traffic Volumes

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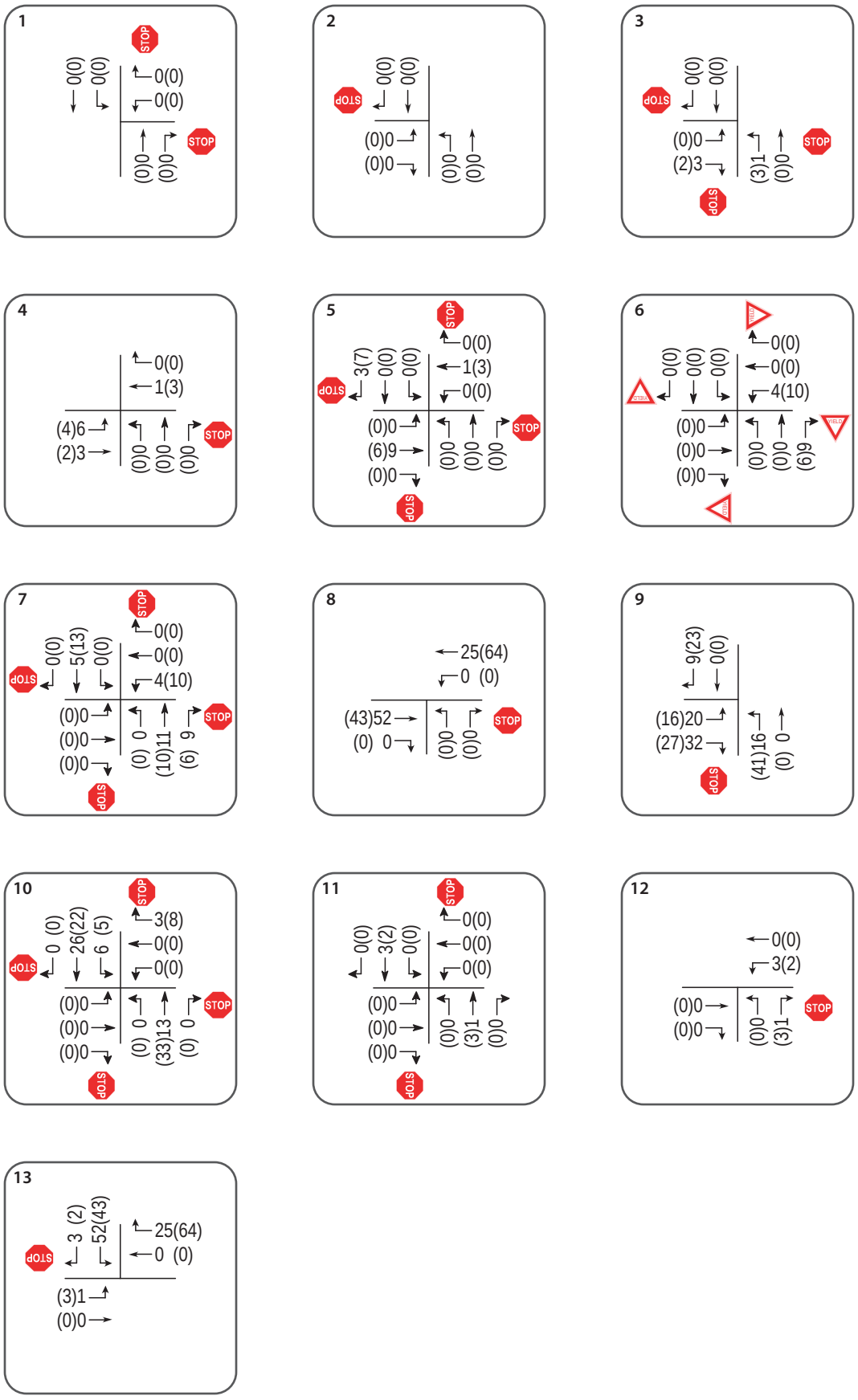
APPENDIX T.1



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Central Arcata Areawide Traffic Impact Study

Figure 15 – Creekside Homes Project Traffic Volumes

Table 13 – Existing plus Creekside Homes Peak Hour Intersection Levels of Service					
Study Intersection *Approach*		**AM Peak**		**PM Peak**	
		Delay	**LOS**	**Delay**	**LOS**
1.	St. Louis Rd/US 101 Overpass	3.4	A	5.4	A
	Northbound St. Louis Rd Approach	*9.8*	*A*	*9.6*	*A*
	Westbound Overpass Approach	*9.0*	*A*	*9.2*	*A*
2.	LK Wood Blvd/US 101 Overpass	3.2	B	2.5	A
	Southbound LK Wood Approach	*11.4*	*B*	*11.7*	*B*
3.	Sunset Ave/LK Wood Blvd	13.3	B	**36.1**	**E**
4.	Sunset Ave/US 101 N Ramps	5.4	A	9.0	A
	Northbound US 101 N Off-ramp Approach	*25.2*	*D*	*28.0*	*D*
5.	Sunset Ave/US 101 S Ramps-G/H Streets	14.3	B	11.4	B
6.	Sunset Ave/Foster Ave-Jay St	5.0	A	4.5	A
7.	Foster Ave/Alliance Rd	19.1	C	**27.2**	**D**
	Restripe Alliance Road Approaches	14.0	B	18.0	C
8.	17th St/Q St	4.1	B	2.8	A
	Northbound Q St Approach	*9.5*	*A*	*9.1*	*A*
9.	17th St/Alliance Rd	4.6	A	2.9	A
	Eastbound 17th St Approach	*21.6*	*C*	*18.0*	*C*
10.	11th St/K St	15.1	C	**26.1**	**D**
11.	11th St/Janes Rd	5.5	A	5.9	A
	Eastbound 11th St Approach	*11.4*	*B*	*10.3*	*B*
	Westbound 11th St Approach	*11.0*	*B*	*10.0*	*B*
12.	Foster Ave/Janes Rd	7.2	A	6.2	A
	Northbound Janes Rd Approach	*8.7*	*A*	*8.7*	*A*
13.	Foster Ave/Creekside Project Entrance	2.4	A	3.8	A
	Northbound Q St Approach	*9.6*	*A*	8.9	*A*

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text = operation below desired threshold; Shaded cells = conditions with recommended improvements

Finding – Ten of the twelve existing study intersections would continue operating acceptably upon the addition of traffic from the Creekside project, and the new intersection of the project entrance would also operate acceptably. Operation at Sunset Avenue/LK Wood Boulevard would continue to be acceptable for the reasons noted above. Restriping would be needed at Foster Avenue/ Alliance Road to achieve acceptable operation upon adding project-generated trips. Operation of the intersection of 11th Street/K Street would deteriorate during the p.m. peak hour as a result of the project, though adding turn lanes on K Street would achieve acceptable operation.

Recommendations – Foster Avenue/Alliance Road should be restriped to provide left-turn and through/right-turn lanes southbound and a right-turn lane and left-turn/through lane on the northbound approach as part of the project, if not already completed as part of another project, as shown in Figure 9. Although LOS D operation is projected at 11th Street/K Street, potential improvements to achieve LOS C operation would require restriping

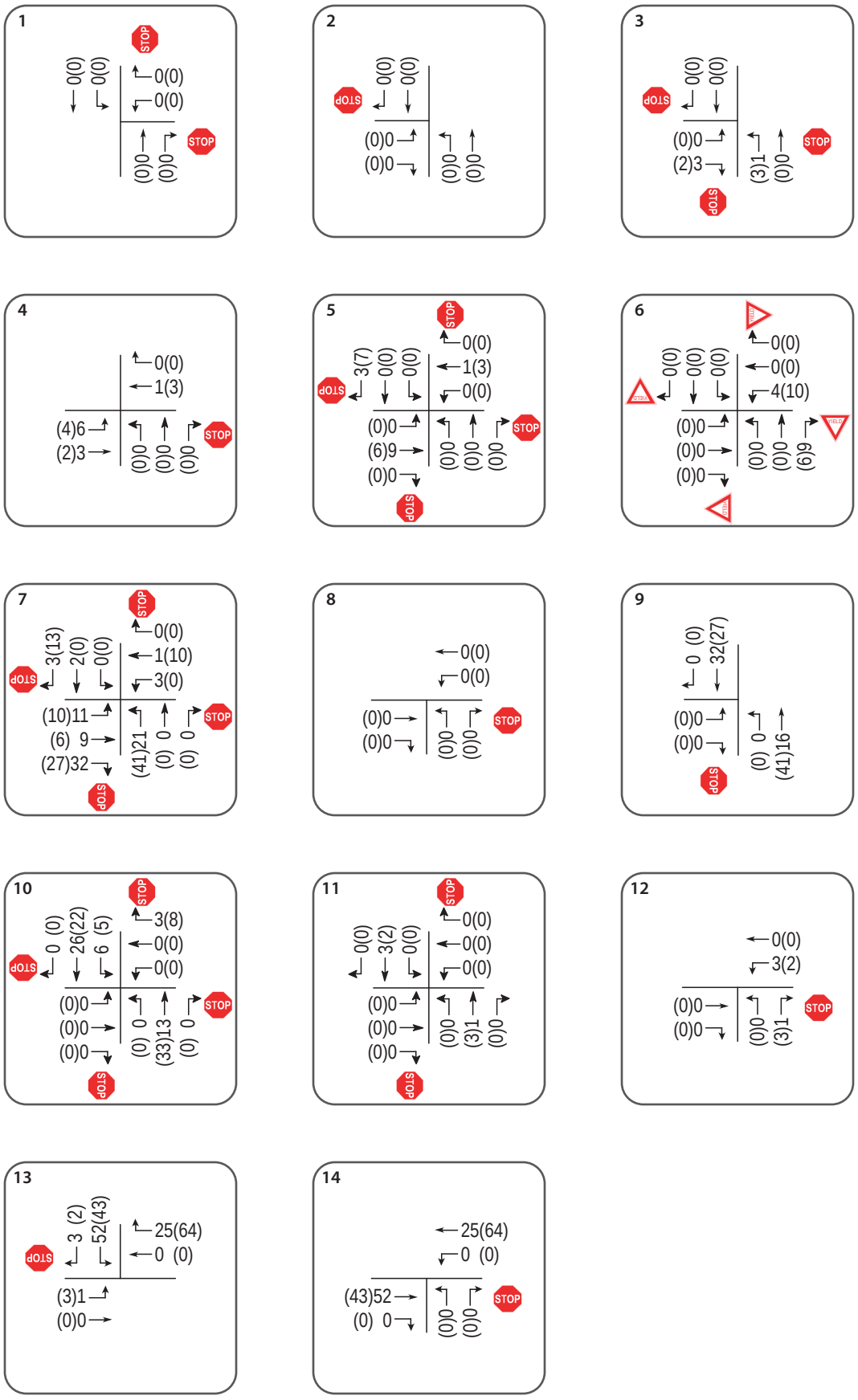
of the 11th Street approaches to provide turn lanes, which would require elimination of bike lanes and modification of the curb returns to include larger radii to accommodate truck turns. Because these modifications would have a negative impact on both pedestrian and bicycle access, and these modes are given priority, the lower service level is deemed acceptable.

Alternative Analysis with Foster Avenue Connection

In order to evaluate conditions with Foster Avenue connected and continuous between Janes Road and Alliance Road, volumes at the study intersections of Foster Avenue/Alliance Road, 17th Street/Q Street and 17th Street/ Alliance Road were reviewed to determine how traffic moves through the area as well as what trips would potentially divert to the new connection. These modified volumes, which are shown in Figure 14, were used to evaluate Existing plus Creekside with Foster Avenue Connection.

With the proposed Foster Avenue connection, and traffic related to the Creekside Homes project added to Existing volumes, the study intersections of Alliance Road/Foster Avenue and 11th Street/K Street would still fall to unacceptable service levels. All other study intersections, with the exception of LK Wood Boulevard/Sunset Avenue, would continue to operate at acceptable levels of service. Project traffic volumes are shown in Figure 16 and the resulting levels of service are summarized in Table 14.

APPENDIX T.1



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Central Arcata Areawide Traffic Impact Study

Figure 16 – Creekside Homes Project Traffic Volumes with Foster Avenue Extenstion

Table 14 – Existing plus Creekside Homes and Alternative Access Peak Hour Intersection Levels of Service				
Study Intersection ***Approach***	**AM Peak**		**PM Peak**	
	Delay	**LOS**	**Delay**	**LOS**
1. St. Louis Rd/US 101 Overpass	3.4	A	5.4	A
Northbound St. Louis Rd Approach	*9.8*	*A*	*9.6*	*A*
Westbound Overpass Approach	*9.0*	*A*	*9.2*	*A*
2. LK Wood Blvd/US 101 Overpass	3.2	B	2.5	A
Southbound LK Wood Approach	*11.4*	*B*	*11.7*	*B*
3. Sunset Ave/LK Wood Blvd	13.3	B	**36.1**	**E**
4. Sunset Ave/US 101 N Ramps	5.4	A	9.0	A
Northbound US 101 N Off-ramp Approach	*25.2*	*D*	*28.0*	*D*
5. Sunset Ave/US 101 S Ramps-G/H Streets	14.3	B	11.4	B
6. Sunset Ave/Foster Ave-Jay St	5.0	A	4.5	A
7. Foster Ave/Alliance Rd	21.7	C	**39.8**	**E**
Restripe Alliance Road Approaches	15.1	C	22.4	C
8. 17th St/Q St	7.7	A	7.3	A
Northbound Q St Approach	*8.8*	*A*	*8.6*	*A*
9. 17th St/Alliance Rd	1.9	A	0.9	A
Eastbound 17th St Approach	*16.9*	*C*	*15.7*	*C*
10. 11th St/K St	15.1	C	**26.1**	**D**
11. 11th St/Janes Rd	5.5	A	5.9	A
Eastbound 11th St Approach	*11.4*	*B*	*10.3*	*B*
Westbound 11th St Approach	*11.0*	*B*	*10.0*	*B*
12. Foster Ave/Janes Rd	7.2	A	6.2	A
Northbound Janes Rd Approach	*8.7*	*A*	*8.7*	*A*
13. Foster Ave/Creekside Project Entrance	2.4	A	2.3	A
Southbound Project Entrance	9.6	A	9.3	A
14. Q St/Foster Ave	0.2	A	0.1	A
Northbound Q St Approach	*9.7*	*A*	9.5	A

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text = operation below the desired threshold; Shaded cells = conditions with recommended improvements

It is noted that the intersection of 17th Street/Alliance Road is projected to operate better under this scenario than without the Foster Avenue connection. This occurs because outbound traffic would be diverted away from this intersection to the new connection, thereby contributing less new traffic at this location.

Findings – Nine of the twelve existing study intersections would continue operating acceptably upon the addition of traffic from the Creekside project as well as the connection of Foster Avenue. As discussed previously, Sunset Avenue/LK Wood Boulevard would operate at a lower service level, though this is considered acceptable under the criteria applied. Similarly, K Street/11th Street is expected to operate at LOS D, but this is considered acceptable under the applied criterion as modifications to increase vehicular capacity would have a negative impact on

pedestrian and bicycle access. The project results in deterioration of operation during the p.m. peak hour at Foster Avenue/Alliance Road to LOS E, even with the turn lanes recommended without the connection. The two new intersections at the project driveway and Q Street/Foster Avenue (which is currently a curve and not an intersection) are expected to operate acceptably.

Recommendations – To achieve acceptable operation at Foster Avenue/Alliance Road, as part of the project the Alliance Road approaches should be restriped to provide left-turn and through/right-turn lanes southbound and a right-turn lane and left-turn/through lane on the northbound approach, if not already completed as part of another project. Further, a left-turn lane would be needed on the eastbound approach of Foster Avenue, as shown in Figure 9.

Existing plus All Project Conditions

Existing Roadways Configuration

Under existing conditions with traffic that would be generated by all six of the projects included in the area-wide study, the study intersections would be expected to continue operating acceptably at LOS C or better with the exception of Sunset Avenue/LK Wood Boulevard, Foster Avenue/Alliance Road and 11th Street/K Street. The results of this scenario are indicated in Table 15.

Table 15 – Existing plus All Projects Peak Hour Intersection Levels of Service

Study Intersection *Approach*	AM Peak		PM Peak	
	Delay	**LOS**	**Delay**	**LOS**
1. St. Louis Rd/US 101 Overpass	5.3	B	6.9	A
Northbound St. Louis Rd Approach	*10.0*	*B*	*9.7*	*A*
Westbound Overpass Approach	*9.4*	*A*	*10.4*	*B*
2. LK Wood Blvd/US 101 Overpass	2.8	A	2.2	A
Southbound LK Wood Approach	*12.5*	*B*	*13.1*	*B*
3. Sunset Ave/LK Wood Blvd	15.7	C	**73.1**	**F**
4. Sunset Ave/US 101 N Ramps	8.0	B	21.1	C
Northbound US 101 N Off-ramp Approach	*38.3*	*E*	*67.7*	*F*
5. Sunset Ave/US 101 S Ramps-G/H Streets	15.3	C	12.4	B
6. Sunset Ave/Foster Ave-Jay St	5.6	A	5.3	A
7. Foster Ave/Alliance Rd	23.3	C	**42.1**	**E**
Restripe Alliance Road Approaches	15.1	C	20.8	C
8. 17th St/Q St	4.1	A	2.8	A
Northbound Q St Approach	*9.5*	*A*	*9.0*	*A*
9. 17th St/Alliance Rd	4.9	A	3.0	A
Eastbound 17th St Approach	*24.6*	*C*	*20.2*	*C*
10. 11th St/K St	17.0	C	**39.0**	**E**
11. 11th St/Janes Rd	5.5	A	5.9	A
Eastbound 11th St Approach	*11.4*	*B*	*10.3*	*B*
Westbound 11th St Approach	*11.0*	*B*	*10.0*	*B*
12. Foster Ave/Janes Rd	7.2	A	6.2	A
Northbound Janes Rd Approach	*8.7*	*A*	*8.7*	*A*
13. Foster Ave/Creekside Project Entrance	2.4	A	3.8	A
Southbound Project Entrance	*9.6*	*A*	*8.9*	*A*

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text = operation below the desired threshold; Shaded cells = conditions with recommended improvements

It should be noted that with the addition of all the project-related traffic volumes, average delay at the intersection of LK Wood Boulevard/US 101 Overpass decreases during the a.m. and p.m. peak hours. While this is counter-intuitive, this condition occurs when a project adds trips to movements that are currently underutilized or have delays that are below the intersection average, resulting in a better balance between approaches and lower overall average delay. The project adds traffic predominantly to the uncontrolled through movement and northbound right turn, both of which have average delays lower than the average for the intersection as a whole, resulting in a slight reduction in the overall average delay. The conclusion could incorrectly be drawn that the project actually improves operation based on this data alone; however, it is more appropriate to conclude that the project trips are expected to make use of excess capacity, so drivers will experience little, if any, change in conditions as a result of the project.

Findings – Eleven of the twelve existing study intersections as well as the new intersection created by Creekside would continue operating acceptably upon adding traffic for all six proposed projects based on the criteria applied. As discussed above, capacity enhancements are not recommended at either Sunset Avenue/LK Wood Boulevard or K Street/11th Street due to the associated negative impacts on pedestrian and bicycle traffic. With the proposed restriping on Alliance Road, which would need to be completed by the first of the six projects to trigger this improvement, the intersection of Foster Avenue/Alliance Road would operate acceptably upon the addition of the traffic generated by all six projects. These improvements are shown in Figure 9.

Alternative Analysis with Foster Avenue Connection

With the proposed Foster Avenue connection and the addition of traffic related to all six projects to existing volumes (as modified where appropriate), the study intersections of Foster Avenue/Alliance Road and 11th Street/ K Street are expected to fall to an unacceptable level of service. All other study intersections, with the exception of LK Wood Boulevard/Sunset Avenue, would continue to operate at acceptable levels of service. These results are summarized in Table 16.

Table 16 – Existing plus All Projects with Foster Connection Peak Hour Intersection Levels of Service

Study Intersection *Approach*	AM Peak		PM Peak	
	Delay	**LOS**	**Delay**	**LOS**
1. St. Louis Rd/US 101 Overpass	5.3	B	6.9	A
Northbound St. Louis Rd Approach	*10.0*	*B*	*9.7*	*A*
Westbound Overpass Approach	*9.4*	*A*	*10.4*	*B*
2. LK Wood Blvd/US 101 Overpass	2.8	A	2.2	A
Southbound LK Wood Approach	*12.5*	*B*	*13.1*	*B*
3. Sunset Ave/LK Wood Blvd	15.7	C	**73.1**	**F**
4. Sunset Ave/US 101 N Ramps	8.0	B	21.1	C
Northbound US 101 N Off-ramp Approach	*38.3*	*E*	*67.7*	*F*
5. Sunset Ave/US 101 S Ramps-G/H Streets	15.3	C	12.4	B
6. Sunset Ave/Foster Ave-Jay St	5.6	A	5.3	A
7. Foster Ave/Alliance Rd	**29.1**	**D**	**58.6**	**F**
Restripe Alliance Road Approaches	16.5	C	**27.0**	**D**
Additional: Restripe EB Approach	15.5	C	24.2	C
8. 17th St/Q St	7.7	A	7.3	A
Northbound Q St Approach	*8.8*	*A*	*8.6*	*A*
9. 17th St/Alliance Rd	1.9	A	0.9	A
Eastbound 17th St Approach	*19.4*	*C*	*17.1*	*C*
10. 11th St/K St	17.0	C	**39.0**	**E**
11. 11th St/Janes Rd	5.5	B	5.9	A
Eastbound 11th St Approach	*11.4*	*B*	*10.3*	*B*
Westbound 11th St Approach	*11.0*	*B*	*10.0*	*B*
12. Foster Ave/Janes Rd	7.2	A	6.2	A
Northbound Janes Rd Approach	*8.7*	*A*	*8.7*	*A*
13. Foster Ave/Creekside Project Entrance	2.4	A	2.3	A
Southbound Project Entrance	*9.6*	*A*	*9.3*	*A*
14. Q St/Foster Ave	0.2	A	0.1	A
Northbound Q St Approach	9.7	A	9.5	A

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* **Bold** text = operation below the desired threshold; Shaded cells = conditions with recommended improvements

Findings – Eleven of the twelve existing study intersections would also continue operating acceptably upon adding traffic for all six proposed projects with the Foster Avenue connection based on the criteria applied. With the proposed restriping on Alliance Road, which would need to be completed by the first of the six projects to trigger the need for this improvement, the intersection of Foster Avenue/Alliance Road would still operate unacceptably upon the addition of the traffic generated by all six projects with the Foster Avenue connection. A left-turn lane on the eastbound approach would be required to bring the level of service to an acceptable LOS C.

Recommendations – As shown in Figure 9, Foster Avenue/Alliance Road should be restriped to provide left-turn and through/right-turn lanes southbound and a right-turn lane and left-turn/through lane on the northbound approach as part of the first project. If the Foster Avenue connection is completed, then the west leg at Alliance Road should be restriped with a left-turn lane.

Future plus Project Conditions

Conditions were evaluated with each of the six projects added individually to the future volumes as well as with all six added to future volumes. It is noted that to arrive at future volumes a growth rate was applied uniformly to all movements at all intersections without specific consideration of the growth potential for each movement. This approach generally results in a relatively conservative analysis as project-generated trips, which would normally be considered as part of this future growth, are then added on top of the estimated increase. Because of the conservative approach applied, the volumes projected for Future plus Project conditions, especially the "all projects" scenario, are unlikely to ever actually be experienced, but the analysis performed provides guidance in the event that volumes do increase to this level.

Future plus The Village

Upon the addition of traffic generated by The Village to the anticipated Future volumes, four of the seven study intersections are expected to operate acceptably. Sunset Avenue/LK Wood Boulevard, Sunset Avenue/US 101 North Ramps, and Foster Avenue/Alliance Road intersections would operate at a service level below LOS C in their current configurations. The Future plus Project operating conditions are summarized in Table 17.

Table 17 – Future plus The Village Peak Hour Intersection Levels of Service

	Study Intersection ***Approach***	**AM Peak**		**PM Peak**	
		Delay	**LOS**	**Delay**	**LOS**
1.	St. Louis Rd/US 101 Overpass	5.1	A	7.0	A
	Northbound St. Louis Rd Approach	*10.4*	*B*	*9.9*	*A*
	Westbound Overpass Approach	*9.5*	*A*	*10.8*	*B*
2.	LK Wood Blvd/US 101 Overpass	3.3	A	2.6	A
	Southbound LK Wood Approach	*14.4*	*B*	*14.9*	*B*
3.	Sunset Ave/LK Wood Blvd	19.9	C	**122.3**	**F**
	Roundabout – Intersections 3 and 4	12.3	B	27.7	D
4.	Sunset Ave/US 101 N Ramps	10.6	B	**28.8**	**D**
	Northbound US 101 N Off-ramp Approach	*53.0*	*F*	*94.3*	*F*
5.	Sunset Ave/US 101 S Ramps-G/H Streets	20.2	C	13.0	B
6.	Sunset Ave/Foster Ave-Jay St	5.7	A	5.2	A
7.	Foster Ave/Alliance Rd	**40.4**	**E**	**73.1**	**F**
	Roundabout	8.6	A	9.1	A

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* ** = delay greater than 120 seconds; **Bold** text = operation below desired threshold; Shaded cells = conditions with recommended improvements

Findings – Four of the seven study intersections would continue operating acceptably upon adding traffic from the Sunset Terrace project to the future volumes. With the roundabout described previously as being needed between Sunset Avenue/LK Wood Boulevard and Sunset Avenue/US 101 North Ramps, these two intersections would operate acceptably upon adding project-generated traffic. With the roundabout recommended at Foster

Avenue/Alliance Road, this intersection would also operate acceptably upon the addition of the Sunset Terrace generated traffic.

Recommendation – To fund the improvements expected to be needed to accommodate future growth, including The Village project, proportional share fees should be paid as described in the section dedicated to this topic.

Future plus Canyon Creek

Upon adding traffic generated by the Canyon Creek project to the anticipated Future volumes, four of the seven study intersections are expected to operate acceptably. Sunset Avenue/LK Wood Boulevard, Sunset Avenue/US 101 North Ramps, and Foster Avenue/Alliance Road intersections would operate at service levels below the desired threshold in their current configurations. The Future plus Project operating conditions are summarized in Table 18.

Table 18 – Future plus Canyon Creek Peak Hour Intersection Levels of Service

	Study Intersection ***Approach***	**AM Peak**		**PM Peak**	
		Delay	**LOS**	**Delay**	**LOS**
1.	St. Louis Rd/US 101 Overpass	3.5	A	5.6	A
	Northbound St. Louis Rd Approach	*10.1*	*B*	*9.9*	*A*
	Westbound Overpass Approach	*9.1*	*A*	*9.4*	*A*
2.	LK Wood Blvd/US 101 Overpass	3.5	A	2.8	A
	Southbound LK Wood Approach	*12.7*	*B*	*13.1*	*B*
3.	Sunset Ave/LK Wood Blvd	17.3	C	**91.9**	**F**
	Roundabout – Intersections 3 and 4	10.8	B	21.1	C
4.	Sunset Ave/US 101 N Ramps	11.3	B	**35.4**	**F**
	Northbound US 101 N Off-ramp Approach	*56.6*	*F*	*117.3*	*F*
5.	Sunset Ave/US 101 S Ramps-G/H Streets	20.6	C	13.2	B
6.	Sunset Ave/Foster Ave-Jay St	5.8	A	5.4	A
7.	Foster Ave/Alliance Rd	**39.6**	**E**	**70.3**	**F**
	Roundabout	8.5	A	9.1	A

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* ** = delay greater than 120 seconds; **Bold** text = operation below desired threshold; Shaded cells = conditions with recommended improvements

Findings – Four of the seven study intersections would continue operating acceptably upon adding traffic from the Canyon Creek project to anticipated future volumes. The three intersections requiring capacity enhancements at Sunset Avenue/LK Wood Boulevard and Sunset Avenue/US 101 North Ramps as well as Foster Avenue/Alliance Road would also operate acceptably upon the addition of the Canyon Creek trips with the recommended improvements.

Recommendation – Proportional share fees should be paid to fund the improvements expected to be needed to accommodate future growth, including the Canyon Creek project. The proportional shares are detailed in the section dedicated to the Traffic Impact Mitigation Fee Program.

Future plus Sunset Terrace

Upon the addition of Sunset Terrace generated traffic to the anticipated Future volumes, four of the seven study intersections are expected to operate acceptably. Sunset Avenue/LK Wood Boulevard, Sunset Avenue/US 101 North Ramps, and Foster Avenue/Alliance Road intersections would operate below the desired LOS C in their current configurations. The Future plus Project operating conditions are summarized in Table 19.

Table 19 – Future plus Sunset Terrace Peak Hour Intersection Levels of Service

	Study Intersection ***Approach***	**AM Peak**		**PM Peak**	
		Delay	**LOS**	**Delay**	**LOS**
1.	St. Louis Rd/US 101 Overpass	3.5	A	5.6	A
	Northbound St. Louis Rd Approach	*10.1*	*B*	*9.9*	*A*
	Westbound Overpass Approach	*9.1*	*A*	*9.4*	*A*
2.	LK Wood Blvd/US 101 Overpass	3.5	A	2.8	A
	Southbound LK Wood Approach	*12.7*	*B*	*13.1*	*B*
3.	Sunset Ave/LK Wood Blvd	17.4	C	**94.3**	**F**
	Roundabout – Intersections 3 and 4	10.9	B	22.2	C
4.	Sunset Ave/US 101 N Ramps	12.2	B	**40.0**	**D**
	Northbound US 101 N Off-ramp Approach	*61.9*	*F*	**	*F*
5.	Sunset Ave/US 101 S Ramps-G/H Streets	21.0	C	13.4	B
6.	Sunset Ave/Foster Ave-Jay St	5.9	A	5.5	A
7.	Foster Ave/Alliance Rd	**40.7**	**E**	**71.9**	**F**
	Roundabout	8.6	A	9.2	A

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* ** = delay greater than 120 seconds; **Bold** text = operation below desired threshold; Shaded cells = conditions with recommended improvements

Findings – Four of the seven study intersections would continue operating acceptably upon adding traffic from the Sunset Terrace project to the future volumes. With the roundabout mentioned previously as being needed between Sunset Avenue/LK Wood Boulevard and Sunset Avenue/US 101 North Ramps, these two intersections would operate acceptably upon adding project-generated traffic. With the roundabout recommended at the Foster Avenue/Alliance Road, this intersection would also operate acceptably upon the addition of the Sunset Terrace generated traffic.

Recommendation – To fund the improvements expected to be needed to accommodate future growth, including the Sunset Terrace project, proportional share fees should be paid for both roundabout projects as described in the section detailing fees for planned improvements.

Future plus Open Door Health Center

Four of the seven study intersections are expected to operate acceptably upon adding Open Door Health trips to anticipated future volumes. Sunset Avenue/LK Wood Boulevard, Sunset Avenue/US 101 North Ramps, and Foster Avenue/Alliance Road would operate at a service level below LOS C in their current configurations. The Future plus Project operating conditions are summarized in Table 20.

Table 20 – Future plus Open Door Health Center Peak Hour Intersection Levels of Service					
Study Intersection ***Approach***		**AM Peak**		**PM Peak**	
		Delay	**LOS**	**Delay**	**LOS**
1.	St. Louis Rd/US 101 Overpass	3.5	A	5.6	A
	Northbound St. Louis Rd Approach	*10.1*	*B*	*9.9*	*A*
	Westbound Overpass Approach	*9.1*	*A*	*9.4*	*A*
2.	LK Wood Blvd/US 101 Overpass	3.5	A	2.8	A
	Southbound LK Wood Approach	*12.7*	*B*	*13.1*	*B*
3.	Sunset Ave/LK Wood Blvd	17.2	C	**88.7**	**F**
	Roundabout – Intersections 3 and 4	10.7	B	20.6	C
4.	Sunset Ave/US 101 N Ramps	12.7	C	**33.3**	**D**
	Northbound US 101 N Off-ramp Approach	*62.6*	*F*	*110.8*	*F*
5.	Sunset Ave/US 101 S Ramps-G/H Streets	20.5	C	13.1	B
6.	Sunset Ave/Foster Ave-Jay St	5.9	A	5.4	A
7.	Foster Ave/Alliance Rd	**40.9**	**E**	**74.2**	**F**
	Roundabout	8.7	A	9.3	A

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* ** = delay greater than 120 seconds; **Bold** text = operation below desired threshold; Shaded cells = conditions with recommended improvements

Findings – Four of the seven study intersections would continue operating acceptably upon adding traffic from the Open Door Health project to future volumes. Trips generated by the Open Door Health project could be accommodated while maintaining acceptable operation with these proposed improvements.

Recommendation – Proportional share fees should be paid by the Open Door Health applicant to fund both roundabout projects. The Open Door Health project's proportional shares are 3.5 percent for the Sunset Avenue/US 101 North Ramps and LK Wood Boulevard intersections and 9.2 percent for Foster Avenue/Alliance Road.

Future plus Twin Parks

With traffic generated by Twin Parks added to the anticipated Future volumes, four of the seven study intersections are expected to operate acceptably. Sunset Avenue/LK Wood Boulevard, Sunset Avenue/US 101 North Ramps, and Foster Avenue/Alliance Road intersections would have operating conditions below LOS C in their current configurations. The Future plus Project operating conditions are summarized in Table 21.

Table 21 – Future plus Twin Parks Peak Hour Intersection Levels of Service					
Study Intersection	***Approach***	**AM Peak**		**PM Peak**	
		Delay	**LOS**	**Delay**	**LOS**
1.	St. Louis Rd/US 101 Overpass	3.5	A	5.6	A
	Northbound St. Louis Rd Approach	*10.1*	*B*	*9.9*	*A*
	Westbound Overpass Approach	*3.5*	*A*	*9.4*	*A*
2.	LK Wood Blvd/US 101 Overpass	3.5	A	2.8	A
	Southbound LK Wood Approach	*12.7*	*B*	*13.1*	*B*
3.	Sunset Ave/LK Wood Blvd	17.2	C	**89.9**	**F**
	Roundabout – Intersections 3 and 4	10.7	B	20.4	C
4.	Sunset Ave/US 101 N Ramps	10.8	B	**31.8**	**D**
	Northbound US 101 N Off-ramp Approach	*54.3*	*F*	*105.6*	*F*
5.	Sunset Ave/US 101 S Ramps-G/H Streets	20.3	C	13.1	B
6.	Sunset Ave/Foster Ave-Jay St	5.8	A	5.3	A
7.	Foster Ave/Alliance Rd	**38.7**	**E**	**68.8**	**F**
	Roundabout	8.5	A	9.0	A

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* ** = delay greater than 120 seconds; **Bold** text = operation below desired threshold; Shaded cells = conditions with recommended improvements

Findings – Three of the seven study intersections would operate unacceptably under anticipated future volumes, without or with the Twin Parks project. With the roundabouts described previously, all intersections would operate acceptably upon the addition of the Twin Parks project traffic.

Recommendation – Proportional share fees should be paid by the Twin Park applicant to fund both roundabout projects. The Twin Park project's proportional shares are 2.6 percent for the Sunset Avenue/US 101 North Ramps and LK Wood Boulevard intersections and 1.4 percent for Foster Avenue/Alliance Road.

Future plus Creekside Homes

The Creekside project was again evaluated both with the current street configuration as well as an alternative that includes the connection of Foster Avenue west of Alliance Road and east of Q Street, where currently the McDaniel Slough divides the road. Four to five additional intersections are included in the study area for this project, depending on the circulation alternative, as well as the new intersection created by the project entrance road.

Existing Roadways Configuration

With Creekside Homes traffic added to the anticipated Future volumes, the four of seven study intersections evaluated for all projects are expected to operate acceptably and the same three locations would operate unacceptably. Of the additional intersections evaluated for this project, one (11th Street/K Street) is expected to operate at a service level below LOS C. The Future plus Project operating conditions are summarized in Table 22.

Table 22 – Future plus Creekside Homes Peak Hour Intersection Levels of Service

Study Intersection *Approach*	AM Peak		PM Peak	
	Delay	**LOS**	**Delay**	**LOS**
1. St. Louis Rd/US 101 Overpass	3.5	A	5.6	A
Northbound St. Louis Rd Approach	*10.1*	*B*	*9.9*	*A*
Westbound Overpass Approach	*9.1*	*A*	*9.4*	*A*
2. LK Wood Blvd/US 101 Overpass	3.5	A	2.8	A
Southbound LK Wood Approach	*12.7*	*B*	*13.1*	*B*
3. Sunset Ave/LK Wood Blvd	17.2	C	**89.1**	**F**
Roundabout – Intersections 3 and 4	10.7	B	20.1	C
4. Sunset Ave/US 101 N Ramps	10.9	B	**29.7**	**D**
Northbound US 101 N Off-ramp Approach	*54.8*	*F*	*99.0*	*F*
5. Sunset Ave/US 101 S Ramps-G/H Streets	20.4	C	13.1	B
6. Sunset Ave/Foster Ave-Jay St	5.7	A	5.3	A
7. Foster Ave/Alliance Rd	**42.8**	**E**	**75.5**	**F**
Roundabout	8.6	A	9.3	A
8. 17th St/Q St	4.4	B	3.1	A
Northbound Q St Approach	*9.6*	*A*	*9.2*	*A*
9. 17th St/Alliance Rd	7.3	A	4.0	A
Eastbound 17th St Approach	*37.4*	*E*	*28.8*	*D*
10. 11th St/K St	**25.8**	**D**	**96.4**	**F**
11. 11th St/Janes Rd	5.8	B	6.1	B
Eastbound 11th St Approach	*12.3*	*B*	*10.7*	*B*
Westbound 11th St Approach	*11.9*	*B*	*10.5*	*B*
12. Foster Ave/Janes Rd	7.3	A	6.2	A
Northbound Janes Rd Approach	*8.7*	*A*	*8.8*	*A*
13. Foster Ave/Creekside Project Entrance	2.1	A	2.1	A
Southbound Creekside Project Entrance	*9.9*	*A*	9.5	A

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* ** = delay greater than 120 seconds; **Bold** text = operation below desired threshold; Shaded cells = conditions with recommended improvements

Findings – Nine of the thirteen intersections studied for this project are expected to continue operating acceptably upon adding traffic from the Creekside project to future volumes. Improvements have been identified previously to provide sufficient capacity at three of the four locations that are otherwise expected to operate below LOS C.

The intersection of 11th Street/K Street, which is expected to operate at LOS F under Future volumes without the project, is expected to continue operating at greater than desired delays during the p.m. peak hour upon adding project-generated traffic to anticipated future volumes. Various options for increasing capacity were explored, including turn lanes and even a roundabout, but given the constraints on two of the four corners associated with buildings and signs, a roundabout does not appear to be a feasible option, and adding turn lanes was deemed to have a substantial negative impact on pedestrian and bicycle traffic. As discussed under Future Conditions

(without the Project), the anticipated higher delays are deemed acceptable to offset the negative impacts on pedestrians and bicyclists.

Recommendations – To fund the improvements identified as being needed to accommodate anticipated future growth, including the Creekside project, proportional share fees should be paid as indicated in the section dedicated to this information.

Alternative Analysis with Foster Avenue Connection

With the Foster Avenue connection, the addition of traffic generated by Creekside Homes to future volumes would result in the impacts at the same intersections of Sunset Avenue/LK Wood Boulevard, Sunset Avenue/US 101 North Ramps, Foster Avenue/Alliance Road and 11th Street/K Street, if left in their current configurations. Future volumes (without the Project) with the Foster Avenue Extension are shown in Figure 17. Operating conditions for the Future plus Creekside Homes with the Foster Avenue connection scenario are summarized in Table 23.

APPENDIX T.1

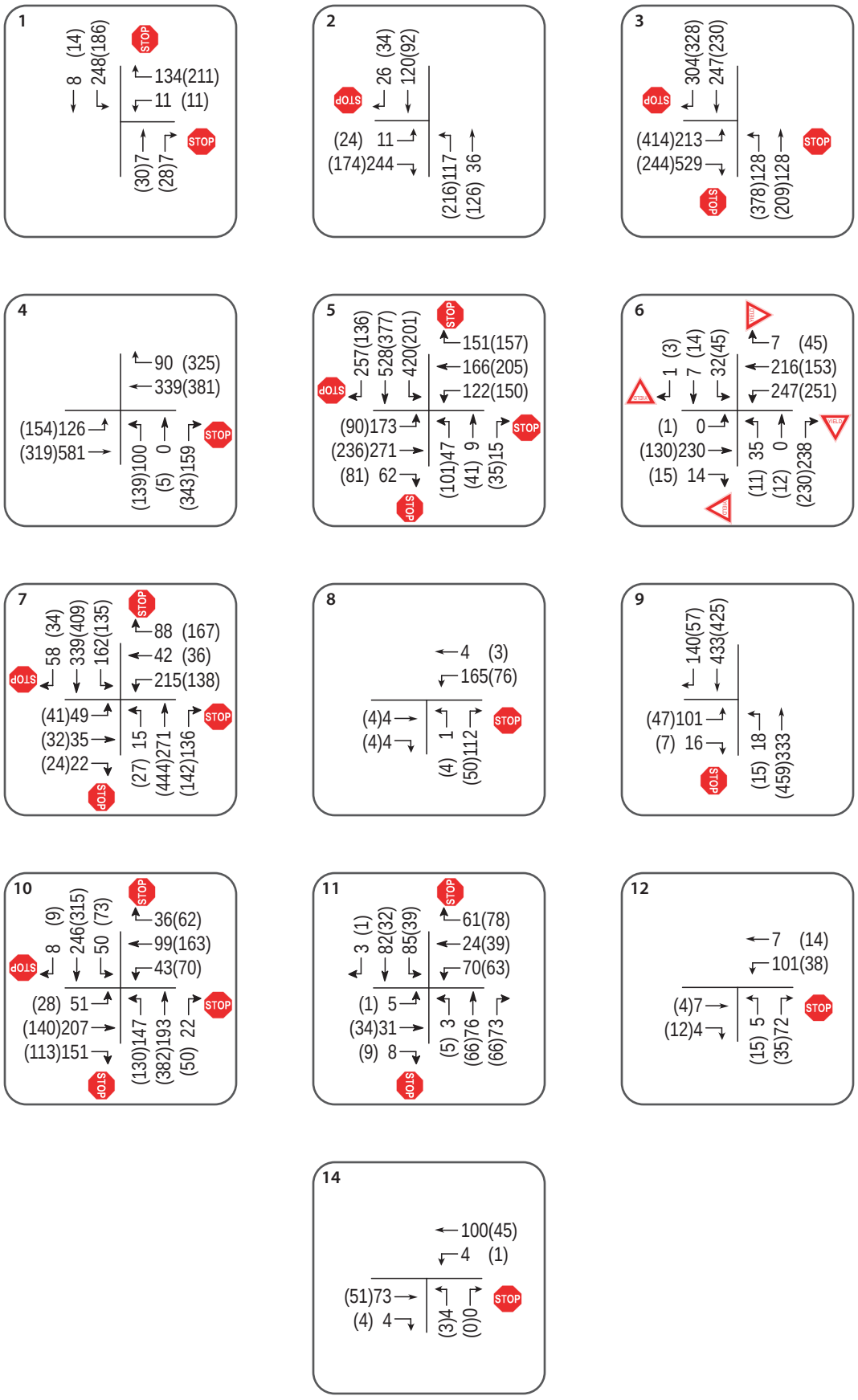

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Figure 17 – Future Traffic Volumes with Foster Avenue Extension

Table 23 – Future plus Creekside Homes with Foster Connection Peak Hour Intersection Levels of Service

Study Intersection *Approach*	AM Peak		PM Peak	
	Delay	**LOS**	**Delay**	**LOS**
1. St. Louis Rd/US 101 Overpass	3.5	A	5.6	A
Northbound St. Louis Rd Approach	*10.1*	*B*	*9.9*	*A*
Westbound Overpass Approach	*9.1*	*A*	*9.4*	*A*
2. LK Wood Blvd/US 101 Overpass	3.5	A	2.8	A
Southbound LK Wood Approach	*12.7*	*B*	*13.1*	*B*
3. Sunset Ave/LK Wood Blvd	17.2	C	**89.1**	**F**
Roundabout – Intersections 3 and 4	10.7	B	20.1	C
4. Sunset Ave/US 101 N Ramps	10.9	B	**29.7**	**D**
Northbound US 101 N Off-ramp Approach	*54.8*	*F*	*99.0*	*F*
5. Sunset Ave/US 101 S Ramps-G/H Streets	20.4	C	13.1	B
6. Sunset Ave/Foster Ave-Jay St	5.7	A	5.3	A
7. Foster Ave/Alliance Rd	**51.4**	**F**	**99.8**	**F**
Roundabout	7.6	A	10.0	B
8. 17th St/Q St	7.7	A	7.3	A
Northbound Q St Approach	*8.9*	*A*	*8.6*	*A*
9. 17th St/Alliance Rd	2.5	A	1.1	A
Eastbound 17th St Approach	*21.9*	*C*	*20.5*	*C*
10. 11th St/K St	**25.8**	**D**	**96.4**	**F**
11. 11th St/Janes Rd	5.8	A	6.1	B
Eastbound 11th St Approach	*12.3*	*B*	*10.7*	*B*
Westbound 11th St Approach	*11.9*	*B*	*10.5*	*B*
12. Foster Ave/Janes Rd	7.3	A	6.2	A
Northbound Janes Rd Approach	*8.7*	*A*	*8.8*	*A*
13. Foster Ave/Creekside Project Entrance	2.1	A	2.1	A
Southbound Project Entrance	*9.9*	*A*	*9.5*	*A*
14. Q St/Foster Ave	0.3	A	0.2	A
Northbound Q St Approach	*10.0*	*B*	*9.6*	*A*

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* ** = delay greater than 120 seconds; **Bold** text = operation below desired threshold; Shaded cells = conditions with recommended improvements

Findings – Ten of the fourteen intersections analyzed for this scenario are expected to continue operating acceptably upon adding traffic from the Creekside project to future volumes with the Foster Avenue connection. Improvements have been identified previously that would provide sufficient capacity at three of the four locations that are expected to operate below the LOS C threshold otherwise. While the intersection of 11th Street/K Street is expected to operate at LOS F during the p.m. peak hour without or with the project, because any improvements that could feasibly be made at this location would result in negative impacts on pedestrian and bicycle access, the lower service level was deemed acceptable.

Recommendations – To fund the improvements identified as being needed to accommodate anticipated future growth, including the Creekside project, proportional share fees should be paid as described in the section regarding fees.

Future plus All Project Conditions

An additional alternative was analyzed for the Creekside project. The alternative would include the connection of Foster Avenue west of Alliance Road and east of Q Street, where currently Janes Creek divides the road. The study area for both Creekside project scenarios includes additional intersections.

Existing Roadways Configuration

Upon the addition of traffic from all six projects to the anticipated Future volumes, four of the seven study intersections evaluated for all projects are expected to operate acceptably. Sunset Avenue/LK Wood Boulevard, Sunset Avenue/US 101 North Ramps, and Foster Avenue/Alliance Road would operate at a service level below the threshold of LOS C in their current configurations. Of the additional intersections analyzed for the Creekside project, the intersection of 11th Street/K Street is projected to operate at LOS F during the p.m. peak hour. The Future plus Project operating conditions are summarized in Table 24.

Table 24 – Future plus All Projects Peak Hour Intersection Levels of Service

Study Intersection *Approach*	AM Peak		PM Peak	
	Delay	**LOS**	**Delay**	**LOS**
1. St. Louis Rd/US 101 Overpass	5.1	A	7.0	A
Northbound St. Louis Rd Approach	*10.4*	*B*	*9.9*	*A*
Westbound Overpass Approach	*9.5*	*A*	*10.8*	*B*
2. LK Wood Blvd/US 101 Overpass	3.3	A	2.6	A
Southbound LK Wood Approach	*14.4*	*B*	*14.9*	*B*
3. Sunset Ave/LK Wood Blvd	20.9	C	**	**F**
Roundabout – Intersections 3 and 4	13.9	B	**39.9**	**D**
4. Sunset Ave/US 101 N Ramps	18.9	C	**63.3**	**F**
Northbound US 101 N Off-ramp Approach	*96.56*	*F*	**	*F*
5. Sunset Ave/US 101 S Ramps-G/H Streets	23.4	C	14.2	B
6. Sunset Ave/Foster Ave-Jay St	6.4	A	6.2	A
7. Foster Ave/Alliance Rd	**52.5**	**F**	**98.1**	**F**
Roundabout	9.3	A	10.3	B
8. 17th St/Q St	4.4	A	3.1	A
Northbound Q St Approach	*9.6*	*A*	*9.2*	*A*
9. 17th St/Alliance Rd	8.4	A	4.4	A
Westbound 17th St Approach	*45.1*	*E*	*34.4*	*D*
10. 11th St/K St	**32.9**	**D**	**121.3**	**F**
11. 11th St/Janes Rd	5.8	A	6.1	A
Eastbound 11th St Approach	*12.3*	*B*	*10.7*	*B*
Westbound 11th St Approach	*11.9*	*B*	*10.5*	*B*
12. Foster Ave/Janes Rd	7.3	A	6.2	A
Northbound Janes Rd Approach	*8.7*	*A*	*8.8*	*A*
13. Foster Ave/Creekside Project Entrance	2.1	A	2.1	A
Southbound Creekside Project Entrance	*9.9*	*A*	*9.5*	*A*

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* ** = delay greater than 120 seconds; **Bold** text = operation below desired threshold; Shaded cells = conditions with recommended improvements

Findings – Upon adding traffic for the six projects to the future volumes, and with recommendations previously identified as being needed to accommodate future volumes without any of the six projects, three of the study locations are still projected to operate unacceptably. With the roundabout previously indicated as being needed between Sunset Avenue/LK Wood Boulevard and Sunset Avenue/US 101 North Ramps, these intersections would operate acceptably during the a.m. peak hour, but at LOS D during the p.m. peak hour. The intersection of 11th Street/K Street, which is expected to operate at LOS F without the project, would experience further increases in delay with project traffic added, though this is deemed acceptable under the standards applied as discussed previously.

It is noted that the assumed 1.5 percent growth per year used to project the future volumes should be considered conservative. Additionally, the project-generated trips were added to the future volumes; this is also conservative since the projected growth would typically include the growth associated with the proposed projects. A review of volumes at the proposed Sunset Avenue/US 101 North-LK Wood Boulevard roundabout indicates that, in order for operation to deteriorate below LOS C for the proposed roundabout, approximately 1,500 new residential units would need to be constructed that use the interchange for primary access.

Recommendations – While it is anticipated that the proposed roundabout at Sunset Avenue/US 101 North-LK Wood Boulevard will be adequate to accommodate all future growth in the City of Arcata, the City should monitor growth, and use 1,500 new residential units as a trigger indicating the need to evaluate operation and determine if further capacity enhancements are needed at Sunset Avenue/US 101 North-LK Wood Boulevard. As an alternative, the City could elect to use LOS D operation as the acceptable threshold for this location.

Alternative Analysis with Foster Avenue Connection

With the proposed Foster Avenue connection and the addition of traffic related to all six projects to the future volumes, the results of the operational analysis are the same as without the connection; even with improvements proposed under various scenarios three locations are projected to operate unacceptably. The Future plus All Projects with the Foster Avenue connection operating conditions are summarized in Table 25.

Table 25 – Future plus All Projects with Foster Connection Peak Hour Intersection Levels of Service

Study Intersection *Approach*	AM Peak		PM Peak	
	Delay	**LOS**	**Delay**	**LOS**
1. St. Louis Rd/US 101 Overpass	5.1	A	7.0	A
Northbound St. Louis Rd Approach	*10.4*	*B*	*9.9*	*A*
Westbound Overpass Approach	*9.5*	*A*	*10.8*	*B*
2. LK Wood Blvd/US 101 Overpass	3.3	A	2.6	A
Southbound LK Wood Approach	*14.4*	*B*	*14.9*	*B*
3. Sunset Ave/LK Wood Blvd	20.9	C	**	**F**
Roundabout – Intersections 3 and 4	13.9	B	**39.9**	**D**
4. Sunset Ave/US 101 N Ramps	18.9	C	**63.3**	**F**
Northbound US 101 N Off-ramp Approach	*96.56*	*F*	**	*F*
5. Sunset Ave/US 101 S Ramps-G/H Streets	23.4	C	14.2	B
6. Sunset Ave/Foster Ave-Jay St	6.4	A	6.2	A
7. Foster Ave/Alliance Rd	**66.4**	**F**	**	**F**
Roundabout	9.7	A	11.3	B
8. 17th St/Q St	7.7	A	7.3	A
Northbound Q St Approach	*8.9*	*A*	*8.6*	*A*
9. 17th St/Alliance Rd	2.6	A	1.2	A
Westbound 17th St Approach	*24.1*	*C*	*22.7*	*C*
10. 11th St/K St	**32.9**	**D**	**121.3**	**F**
11. 11th St/Janes Rd	5.8	A	6.1	A
Eastbound 11th St Approach	*12.3*	*B*	*10.7*	*B*
Westbound 11th St Approach	*11.9*	*B*	*10.5*	*B*
12. Foster Ave/Janes Rd	7.3	A	6.2	A
Northbound Janes Rd Approach	*8.7*	*A*	*8.8*	*A*
13. Foster Ave/Creekside Project Entrance	2.1	A	2.1	A
Southbound Project Entrance	9.9	A	9.5	A
14. Q St/Foster Ave	0.3	A	0.2	A
Northbound Q St Approach	*10.0*	*B*	9.6	A

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics;* ** = delay greater than 120 seconds; **Bold** text = operation below desired threshold; Shaded cells = conditions with recommended improvements

Findings – With the Foster Avenue connection and trips from all six projects added to Future volumes, as well as various capacity improvements identified above, three of the study intersections are projected to operate at service levels below the desired threshold. As discussed, due to the conservative nature of the study, it appears likely that these volumes will not be achieved, so capacity enhancements should be limited to what can reasonably be expected to be needed. Excess capacity is undesirable in that it generally results in higher travel speeds and comes at the expense of pedestrians and bicyclists.

Recommendations – The City should monitor growth, and use 1,500 new residential units as a trigger indicating the need to evaluate operation at Sunset Avenue/US 101 North-LK Wood Boulevard and determine if further capacity enhancements are needed. As an alternative, the City could elect to use LOS D operation as the acceptable threshold for this location.

Travel Demand Management

As a means of reducing traffic demand and pushing the need for improvements out to a later date if not eliminating some altogether, Travel Demand Management (TDM) techniques should be made part of all new development in Arcata. TDM is generally included in a plan with enforceable measures as a means to reduce the total number of vehicles driving to and from a project site, thereby reducing or at least managing a project's vehicle miles traveled (VMT).

TDM measures are typically enacted in an attempt to induce mode shifts from single occupancy auto travel to transit, ride-share, bicycle, or pedestrian travel. In order to create this shift, TDM measures often include incentives and disincentives to encourage use of alternative transportation options. Benefits associated with TDM strategies include reduced vehicle trips, reduction in overall vehicle miles traveled, reduced congestion, lower carbon emissions, improved public health, and an increase in transportation choices. The most effective TDM programs often include financial incentives through measures such as pricing parking, subsidizing transit, and informing users of the cost savings associated with ride-sharing, biking, or walking.

Ultimately, TDM strategies need to successfully change human travel behavior. TDM measures that work for some people may not work for all. Therefore, an effective TDM plan needs to include multiple options and incentives to allow customization to meet the varied needs of individuals. As such, below are several TDM measures that are applicable to the proposed developments within this study.

Proposed TDM Measures

Transportation Information Packet

Information packets could be provided to tenants when they move in that include transit maps, schedules, and website addresses for all nearby transit operators. This packet would also provide maps showing where bike and pedestrian facilities are located. Further, suggested routes for residents to travel to popular destinations, like Humboldt State University, via active transportation would be provided. These resources would be an effective tool for educating tenants on the variety of transportation options available to them and the health and financial benefits associated with using active forms of transportation.

Car-sharing

Car-sharing can reduce the need for automobile ownership by allowing people to have on-demand access to shared vehicles on an as-needed basis. Car-sharing for tenants traveling to and from a proposed project site would be encouraged by providing a list of car sharing services as part of the move-in packet or by providing cars for sharing as part of the site amenities.

Zipcar Car-Sharing

Zipcar is a common ride-sharing service that can be implemented within the City and near the proposed project sites.

Taxi Services

A project could encourage tenants to use private taxi and on-demand vehicle services. In addition to traditional taxi services, there are other transportation services that provide on-demand rides at a discounted rate. These service providers include Uber or Lyft. While not currently in the area, such services are continuously expanding their area of coverage.

Bicycling

Bike Share

Similar to car sharing, bike sharing allows members to use a bicycle within the system and travel between popular locations where bicycle stations are installed.

Transit

Transit Kiosk

A project could provide a transit kiosk, or centralized information center, on-site that provides transit maps, schedules, fares, and rider information. The kiosk could also sell daily or monthly passes for transit. Further, the kiosk would include maps detailing the closest transit stops and routes to access them.

On-Site Transportation Coordinator

The project applicant potentially could have the on-site property manager that also serves as the transportation coordinator to assist tenants and be a point of contact for transportation questions. This person would be designated to answer questions regarding any TDM measures.

Marketing and Education

The transportation coordinator will also be responsible for general marketing and to host/arrange free workshops on transportation options in the area, trip planning resources, and safe biking/walking classes.

Alternative Modes

Pedestrian Facilities

Given the proximity of the various projects to Humboldt State University and the tendency for college students to walk or bike if possible, it is reasonable to assume that some project residents, patrons, and employees will want to walk, bicycle, and/or use transit to reach the various project sites. In fact, standard trip generation rates reflect the need for such facilities as these rates would be higher if all residents, employees and patrons of various types of development traveled exclusively by passenger vehicle.

As noted in the discussion of existing pedestrian facilities, the existing crossing on Sunset Avenue of the US 101 North ramp and LK Wood Boulevard provides an undesirable condition from the perspective of pedestrian safety and convenience. Conversion to a roundabout, as recommended to accommodate future volumes, would be expected to substantially increase pedestrian safety, so should be pursued as early as possible to improve conditions at this location. As a short-term interim improvement, new markings should be provided to better delineate and protect pedestrian facilities, as shown in Figure 18. Caltrans has indicated a willingness to install these markings in the near term. As a longer-timer interim improvement, raised islands could replace the striped islands, as shown in Figure 19. With these improvements, the intersection is expected to continue to operate at LOS C, with no more than a 3.6-second increase in delay under volumes for existing conditions plus all projects.

The Village

Sidewalks do not currently exist along the project's frontages or elsewhere on St. Louis Road, and this route is used by numerous heavy vehicles generated by a lumber yard near the US 101 Overpass. As indicated on the site plan, included in the appendices, no off-site sidewalk improvements are included. However, the City's proposed bikeway network includes a trail along the railroad right-of-way on the east side of St. Louis Road, across from the project site.

While there would be no vehicular access to Eye Street, it is understood that there would be pedestrian and bicycle access, and from the site to Humboldt State University, it is actually a shorter distance via Eye Street than St. Louis Road. While there are no sidewalks on Eye Street in the vicinity of the project, this roadway has lower volumes and does not experience substantial truck traffic. Similarly, Jay Street has discontinuous sidewalk facilities, but relatively low traffic volumes so can serve pedestrian trips.

Findings – Pedestrian facilities for the project site are expected to be inadequate. Because of the potential for conflict with truck traffic along St. Louis Road, pedestrians would be more appropriately routed along Eye Street toward the Sunset Avenue overcrossing toward Humboldt State University. Providing continuous sidewalk or trails facilities to the north is likely infeasible due to lack of right-of-way; however, the project should construct a portion of the planned trail along the railroad right-of-way to provide future connectivity for site residents.

Recommendation – Sidewalks should be constructed on the project frontage as well as within the site connecting buildings and to Eye Street. The portion of the planned trail along the railroad right-of-way across from the site and connecting to the Sunset Avenue/Foster Avenue-Jay Street roundabout should be constructed to provide for future pedestrian and bicycle access. Facilities should direct pedestrian traffic toward Eye Street and not St. Louis Road until such time as adjacent section of the trail is completed.

Canyon Creek

Like The Village, the Canyon Creek project would generate pedestrian trips along Eye and Jay Streets toward Sunset Avenue. This area has limited sidewalks, but will be served by the trail on the railroad right-of way when complete.

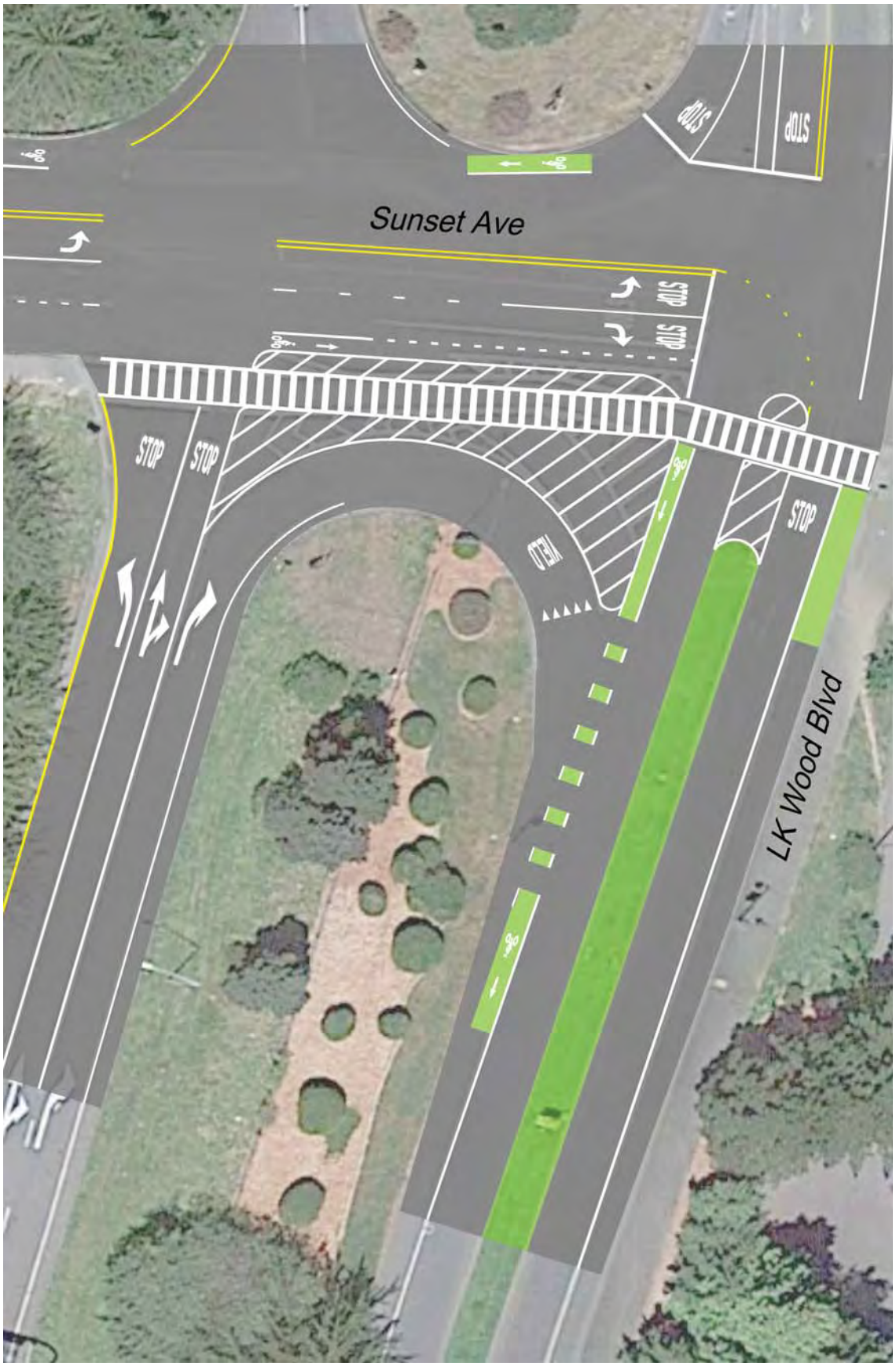

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Figure 18 – Conceptual Interim Left-Turn Pocket Recommendation for LK Wood Boulevard/Sunset Avenue

Findings – Pedestrian facilities for the project site are inadequate. While pedestrians will be able to use Eye and Jay Streets in the short term, the completion of the trail along the railroad right-of-way is necessary to serve such trips safely.

Recommendation – The portion of the planned trail along the railroad right-of-way along the project frontage and connecting to Sunset Avenue should be constructed to provide for adequate pedestrian and bicycle access.

Sunset Terrace

Sidewalks do not currently exist along the project's frontages on either Foster Avenue or Sunset Avenue, so should be included as part of the project improvements. Additionally, a connection should be made between the project site and the existing trail through Shay Park on the south side of Foster Avenue. To ensure visibility to westbound drivers, the crossing should be placed as close to the east end of the project site as possible and near a streetlight. Consideration should be given to installing the crosswalk on a speed table to increase visibility and help maintain lower traffic speeds at the crossing location. Finally, to connect Sunset Avenue to the trail a pedestrian pathway or sidewalk should be provided between Sunset Avenue and Foster Avenue along the easterly border of the site.

Finding – Pedestrian facilities for the project site are inadequate.

Recommendation – Sidewalks should be constructed on the Foster Avenue and Sunset Avenue frontages as part of the project. Also, the project should construct facilities to support a crosswalk connecting the site to the trail on the south side of Foster Avenue. Finally, a pedestrian pathway or sidewalk should be provided on the easterly border of the site between Sunset Avenue and Foster Avenue.

Open Door Community Health Center

Like Sunset Terrace, this project is located between Foster Avenue and Sunset Avenue, neither of which has sidewalks so should therefore be included along the frontages as part of the project improvements. A connection across Foster Avenue to the existing trail through Shay Park is needed. While it is anticipated that Sunset Terrace will precede this project, should Open Door be constructed first, a crossing should be installed as close to the west end of the project site as possible and near a streetlight. Consideration should be given to installing the crosswalk on a speed table to increase visibility and help maintain lower traffic speeds at the crossing location. Finally, to connect Sunset Avenue to the trail a pedestrian pathway or sidewalk should be provided between Sunset Avenue and Foster Avenue along the westerly border of the site if not already installed by the Sunset Terrace project.

Finding – Pedestrian facilities for the project site are inadequate.

Recommendation – Sidewalks should be constructed on the Foster Avenue and Sunset Avenue frontages as part of the project. If not already completed, the project should construct facilities to support a crosswalk connecting the site to the trail on the south side of Foster Avenue and a pedestrian pathway or sidewalk should be provided on the easterly border of the site between Sunset Avenue and Foster Avenue.

Twin Parks Apartment

Twin Parks has frontage along Foster Avenue. Sidewalks exist on the project's frontage. The Shay Park trail runs behind the project site.

Finding – Pedestrian facilities for the project site are inadequate.

Recommendation – A connection should be provided between the project site and the trail system in Shay Park.

Creekside Homes

This project site is located in a rural area with no existing pedestrian facilities. As currently proposed, a connection would be made to a deeded right-of-way that would provide access between the site and Alliance Road. It is anticipated that sidewalks would be provided through the site, connecting homes along the internal street system, as well as along the frontage on Foster Avenue. It is understood that two pedestrian crossings would be provided on-site, one in the middle of the site and one at the south end. The sidewalk as shown on preliminary plans terminates at the edge of Janes Creek, without providing a connection through to Heather Lane.

Finding – Pedestrian facilities for the project site as preliminarily proposed are inadequate.

Recommendation – In addition to the sidewalks proposed on the preliminary site plan, a pedestrian connection should be provided between the project site and Heather Lane, regardless of whether Foster Road is extended or not. If extended, sidewalk should be provided along the length of the extension. Further, the trail connecting the site to Alliance Road should be constructed as part of the project if sufficient right-of-way is available.

Bicycle Facilities

While bike lanes are provided on Sunset Avenue between G Street-H Street and LK Wood Boulevard in the eastbound direction, the bike lane starts at the US 101 North On-ramp and ends short of the US 101 South Off-ramp in the westbound direction. Bicycle access would be substantially improved through provision of the "cycle track" or Class IV bikeway on the south side of Sunset Avenue which is included as part of the roundabout conversion at the easterly end of this segment, as depicted in Figure 5. While this improvement was identified as being needed for long-term volume increases, it would provide a benefit immediately in terms of accessibility for bicycle traffic, so should be pursued sooner, if possible.

The Village

There are currently no bicycle facilities in the vicinity of The Village site. As noted for pedestrian trips, use of St. Louis Road is undesirable due to the high volume of truck traffic.

Findings – Bicycle facilities for the project site are inadequate. Because of the potential for conflict with truck traffic along St. Louis Road, bicyclists would be more appropriately routed along Eye Street toward the Sunset Avenue overcrossing toward Humboldt State University. Providing continuous sidewalk or trails facilities to the north is likely infeasible due to lack of right-of-way; however, the project should construct a portion of the planned trail along the railroad right-of-way to provide future connectivity for site residents.

Recommendation – A bicycle connection should be provided between the site and Eye Street. The portion of the planned trail along the railroad right-of-way across from the site and connecting to the Canyon Creek site should be constructed to provide for future pedestrian and bicycle access. Bicycle traffic should be directed toward Eye Street and not St. Louis Road until such time as adjacent section of the trail is completed.

Canyon Creek

Canyon Creek would generate bicycle trips along Eye and Jay Streets toward Sunset Avenue, with bicyclists needing to ride in the street along these narrow roadways.

Findings – Bicycle facilities for the project site are inadequate. While Eye and Jay Streets can be used for bicycle trips, the completion of the trail along the railroad right-of-way is necessary to serve such trips safely.

Recommendation – The portion of the planned trail along the railroad right-of-way along the project frontage and connecting to Sunset Avenue should be constructed to provide for adequate pedestrian and bicycle access.

Sunset Terrace

Foster Avenue has existing bike lanes in both directions connecting to the areawide system.

Finding – Bicycle facilities for the project site will be adequate upon completion of the connection across Foster Avenue to the trailhead in Shay Park.

Recommendation – The crosswalk on Foster Avenue should be constructed as recommended for pedestrian access.

Open Door Community Health Center

Foster Avenue has existing bike lanes in both directions connecting to the areawide system.

Finding – Bicycle facilities for the project site will be adequate upon completion of the connection across Foster Avenue to the trailhead in Shay Park.

Recommendation – The crosswalk on Foster Avenue should be constructed as recommended for pedestrian access, if not already complete when this project moves forward.

Twin Parks Apartment

Twin Parks is located near the corner of Foster Avenue and Alliance Road; both streets have existing bike lanes. The Shay Park trail runs behind the project site.

Findings – Bicycle facilities for the project site are adequate, though a connection between the site and the trail system should be provided.

Recommendation – A connection should be provided between the project site and the trail system in Shay Park.

Creekside Homes

There are no existing bicycle facilities serving this project site. As currently proposed, bicyclists would ride in the road or, eventually, along the trail connecting to Alliance Road.

Finding – Bicycle facilities for the project site as preliminarily proposed are inadequate.

Recommendation – In order to accommodate bicycle trips other than on the adjacent system of County roads, which are narrow and lack amenities, the trail connecting the site to Alliance Road should be constructed as part of the project if sufficient right-of-way is available. As recommended for pedestrian access, a connection should also be made across Janes Creek to connect the site to the easterly portion of Foster Avenue where bike lanes exist.

Bicycle Storage

Short-term bicycle parking will need to be provided at each of the sites by bike racks located to be convenient to the residents, employees and/or patrons. Since site-specific plans are generally unavailable, the adequacy of such on-site facilities will need to be determined on a case-by-case basis as development plans come forward.

Transit

The Village

The Village site is not located within "easy" walking distance of a transit stop as it is more than one-quarter of a mile from the nearest transit route at about 0.35 miles to Foster Avenue where the Arcata Gold and Red Routes runs. Upon completion of the trail along the railroad the distance will remain similar, but the path will be more pedestrian-friendly. While this distance exceeds the typical desirable walking distance, it should be acceptable to college-aged students, so is considered adequate. However, it is understood that a bus stop near the site is proposed as part of the project. The applicant will need to work with local transit provider to have this stop served.

Canyon Creek

This project site is located slightly more than one-quarter mile from a transit stop for the Arcata Gold and Red Routes, though this distance will be reduced to about one-quarter of a mile upon completion of the trail along the railroad right-of-way that is recommended as part of the project. This would make transit access adequate.

Sunset Terrace

The Arcata Gold and Red Routes travel along Foster Avenue, directly in front of the project site. Transit access is therefore adequate.

Open Door Community Health Center

This site has adequate access to transit via the Arcata Gold and Red Routes that travel along Foster Avenue past the site.

Twin Parks Apartment

The Arcata Gold and Red Routes will pass directly by this site along Foster Avenue, providing acceptable transit access.

Creekside Homes

There are no existing transit facilities serving this site, nor are any currently contemplated. As currently envisioned, the project would provide inadequate pedestrian access to existing transit services.

Finding – Transit facilities serving the project site are inadequate.

Recommendation – In order to provide access to transit, the trail connecting the site to Alliance Road as well as a connection across McDaniel Slough (Janes Creek) should be constructed as part of the project if sufficient right-of-way is available and/or Foster Avenue is extended to connect at Heather Lane.

Traffic Impact Mitigation Fee Program

In order to fund the improvement projects identified in this report as being needed, the Traffic Impact Mitigation Fee Collection Program was established. The short-term improvement projects included in the fee are re-striping of Sunset Avenue/LK Wood Boulevard and installation of new raised median islands, as shown in Figure 19, as well as the re-striping of Alliance Road/Foster Avenue. The specific improvements needed at the intersection of Alliance Road/Foster Avenue and their associated cost would depend on whether or not the Foster Avenue connection is completed, which would also alter the routes of the Creekside project and therefore the proportional cost toward these improvements.

The future improvements that were included in the fee program are the proposed roundabout combining the two intersections on Sunset Avenue at US 101 North Ramps and LK Wood Boulevard and the mini-roundabout at the intersection of Alliance Road/Foster Avenue. The full estimated cost of each of the improvements projects was included in the fee with the exception of the future roundabout at the intersections on Sunset Avenue at the US 101 North Ramps and LK Wood Boulevard. The cost estimates of each of these projects, along with the percent included in the fee, are summarized in Table 26.

Table 26 – Anticipated Improvement Project Costs

Project Location	Cost (in $1,000's)	Percent of Project Cost included in Fee
Near-term		
Sunset Ave/LK Wood Blvd Re-Striping	$98.9	100%
Alliance Rd/Sunset Ave Re-Stripe	$6.4 / $8.8*	100%
Future		
Sunset Ave/LK Wood Blvd Roundabout	$3,195	15%
Alliance Rd/Sunset Ave Roundabout	$325	100%
Total of All Improvement Projects	**$3,625.3/$3,627.7***	**$909.5/$911.9***

Notes: * cost with the Foster Avenue Connection

Using the trips that each project contributes to each of the locations needing improvements, the proportional share of costs for each development project were calculated. The sum of these amounts both without and with the Foster Avenue connection are indicated for each development project in Table 27.

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Central Arcata Areawide Traffic Impact Study

Figure 19 – Conceptual Long Term Left-Turn Pocket Recommendation for LK Wood Boulevard/Sunset Avenue

APPENDIX T.1

Table 27 – Summary of Traffic Impact Mitigation Fee by Development Project		
Development Project	**Cost (in $1,000's)**	**Cost (in $1,000's) – with Foster Avenue Connection**
The Village	$353.55	$337.59
Canyon Creek	$97.30	$86.89
Open Door	$146.37	$133.19
Sunset Terrace	$152.80	$122.27
Twin Parks	$50.95	$45.4
Creekside	$108.57	$186.59
Total	**$909.54**	**$911.9**

Notes: ORH = Old Redwood Highway

Additional details for each of the improvement projects and the proportional share assigned to each development projects are included in the Appendix E

Conclusions and Recommendations

Conclusions

- The Village project would be expected to generate an average of 1,578 daily trips; of which 121 trips would be during the a.m. peak hour and 150 would be during the p.m. peak hour.
- Canyon Creek project is expected to generate 572 daily trips on average with 40 trips during the morning peak hour and 58 trips during the evening peak hour.
- The Open Door Health Center would be expected to generate 1,084 daily trips; 72 trips would be expected during the morning peak hour and 107 during the evening peak hour.
- The Sunset Terrace project would be expected to generate an average of 984 daily trips which includes 73 during the morning peak hour and 96 during the evening peak hour.
- Twin Parks is expected to generate 366 daily trips, with 23 trips anticipated during the a.m. peak hour and 40 during the p.m. peak hour.
- The Creekside Homes project, which includes single family homes and an assisted living community, would be expected to have a combined total daily trip generation of 1,113 trips which includes 81 trips during the morning peak hour and 111 trips during the p.m. peak hour.
- Under existing conditions, the intersection of LK Wood Boulevard/Sunset Avenue operates below the desired threshold, but still acceptably under the criteria applied; all other study intersections are currently operating at LOS C or better.
- With the exception of the Twin Parks project, the addition of trips from each individual project to existing volumes would result in operation below LOS C at the intersection of Alliance Road/Foster Avenue.
- Additionally, the addition of Creekside project trips, with or without the Foster Avenue connection, results in the intersection of 11th Street/K Street operating at a level of service below the LOS C threshold.
- Eight of the twelve intersection would operate acceptably under future volumes projected using a growth rate of 1.5 percent per year over 20 years. The intersections of Sunset Avenue/LK Wood Boulevard, Sunset Avenue/US 101 North Ramps, Foster Avenue/Alliance Road, and 11th Street/K Street are expected to operate at levels of service below the desired threshold of LOS C. These same four intersections would operate below LOS C with trips added from each individual project as well as all six combined.
- With the proposed recommended roundabout, Alliance Road/Foster Avenue would operate acceptably under all volume scenarios evaluated.
- The recommended five-legged roundabout at Sunset Avenue/US 101 North-LK Wood Boulevard is projected to operate acceptably for all future scenarios except that LOS D operation is projected during the p.m. peak hour with the addition of traffic from all six projects. Because the volume of traffic projected using the growth factor plus the six projects likely results in double-counting of trips, this result is quite conservative.
- 11th Street/K Street is projected to operate at a level of service below LOS C under Existing conditions with trips from the Creekside project added and under Future conditions without or with the Creekside project

traffic. Because potential capacity improvements at this location would have a deleterious effect on pedestrian and bicycle facilities, the lower service level was deemed acceptable.

- Pedestrian access to each of the project sites is generally inadequate.
- Bicycle access to the Village, Canyon Creek, and Creekside Homes projects are inadequate, while access to the Sunset Terrace, Twin Parks, and Open Door Health Center projects will be adequate with the completion recommended connections to the trail system through Shay Park.
- With the exception of the Creekside project, access to transit from all project sites is adequate.

Recommendations

General (All Projects)

- Since the two intersections at LK Wood Boulevard/Sunset Avenue and Sunset Avenue/US 101 North Ramps are in close proximity, it is recommended that any long-term improvements to either of the intersections include the other. Because the City of Arcata does not have signals and given the large right-of-way, a five-legged roundabout that combines the two intersections is recommended.
- Given the conservative analysis in determining the p.m. future scenario with the addition of trips from all six projects, the proposed five-legged roundabout joining the Sunset Avenue/LK Wood Boulevard and Sunset Avenue/US 101 North Ramps intersections is expected to be adequate to accommodate the future growth in Arcata despite the projection of LOS D operation in this analysis. However, the City should monitor growth, and use 1,500 new residential units as a trigger indicating the need to evaluate operation and determine if further capacity enhancements are needed at Sunset Avenue/US 101 North-LK Wood Boulevard. Alternatively, the City could elect to use LOS D operation as the acceptable standard for this location.
- To achieve acceptable LOS C operation at Foster Avenue/Alliance Road under projected future volumes that include area wide growth as well as all six projects, conversion to a roundabout is recommended.

The Village

- If the Village is first of the six projects to be completed the Alliance Road approaches to Foster Avenue should be restriped to provide turn lanes.
- To fund the future improvements expected to be needed to accommodate future growth, the Village project should pay proportional shares as indicated in Table 27.
- Sidewalks should be constructed on the project frontage of St. Louis Road as well as within the site connecting buildings and to Eye Street. The portion of the planned trail along the railroad right-of-way across from the site and connecting to the Canyon Creek site should be constructed as part of the project.
- A bicycle connection should be provided between the site and Eye Street and bike parking provided on-site.
- Facilities should direct pedestrian traffic toward Eye Street and not St. Louis Road until the trail connection to Sunset Avenue is completed.

Canyon Creek

- If Canyon Creek is the first of the six projects to be complete, the restriping of Alliance Road at Foster Avenue should be completed as part of the project.
- In order to fund the improvements necessary to accommodate the projected future growth, the Canyon Creek project should pay fees as indicated in Table 27.
- The portion of planned trail along the railroad right-of way fronting the project site and connecting the Sunset Avenue should be constructed to provide adequate access for pedestrians and bicyclists, as well as to reduce the distance to access transit.

Sunset Terrace

- The restriping at Alliance Road/Foster Avenue should be completed as part of the project is not already in place.
- To help fund the improvements expected to be needed to accommodate the future growth, Sunset Terrace should pay a proportion of the total project costs of the planned improvements, as indicated in Table 27.
- Sidewalks should be provided along both of the Sunset Terrace site's street frontages. A crossing of Foster Road should be provided connecting the site to the existing trail at Shay Park and a pedestrian pathway or sidewalk should be provided on the easterly border of the site between Sunset Avenue and Foster Avenue. These improvements should be completed as part of this project unless the Open Door Health Center project is completed before Sunset Terrace and provides these connections.
- Bicycle parking should be provided on site.

Open Door Health Center

- If not completed by an earlier project, the striping on Alliance Road to provide turn lanes at Foster Avenue should be completed by this project.
- The Open Door Health Center's proportional shares of the recommended improvements as shown in Table 27.
- Sidewalks should be provided along both of the Open Door Health Center site's street frontages. If the Open Door Health Center is completed before the Sunset Terrace project, a crossing of Foster Road should be provided connecting the site to the existing trail at Shay Park. Consideration should be given to a raised crosswalk to improve visibility and support lower travel speeds along this corridor. Finally, a pedestrian pathway or sidewalk should be provided on the easterly border of the site between Sunset Avenue and Foster Avenue, also to be completed by the first project to be completed.
- Bicycle parking should be provided.

Twin Parks

- Proportional share fees for the improvements expected to be needed under future volumes should be paid by the Twin Park applicant as detailed in Table 27.

- Sidewalks should be constructed along the Alliance Road frontage and a connection provided between the project site and the trail system in Shay Park.

- Bicycle racks should be provided as part of the site development.

Creekside Homes

- Creekside Homes should complete the striping modifications at Foster Avenue/Alliance Road if not completed by others, except that the eastbound Foster Avenue approach should be re-striped by this project even if the other striping has already been completed.

- Creekside Homes should pay a proportion of the total project costs of the two recommended improvements. These costs are detailed in Table 27.

- A pedestrian connection should be provided between the project site and Heather Lane, regardless of whether Foster Road is extended or not. If extended, sidewalk should be provided along the length of the extension. Further, the trail connecting the site to Alliance Road should be constructed as part of the project if sufficient right-of-way is available.

- Bicycle racks should be provided as part of the site development.

Study Participants and References

Study Participants

Principal in Charge	Dalene J. Whitlock, PE, PTOE
Assistant Engineer	Briana Byrne, EIT
Graphics/Editing/Formatting	Angela McCoy

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Appendix A

Comments on the Draft Report

APPENDIX T.1

March 13, 2017

Mr. Netra Khatri, P.E.
Assistant City Engineer
City of Arcata
736 F Street
Arcata, CA 95521

Responses to Comments on the *Central Arcata Areawide Traffic Impact Study*

Dear Mr. Khatri;

We are in receipt of several comment letters regarding the draft *Central Arcata Areawide Traffic Impact Study* dated May 16, 2016, as well as input provided by the public and at a Traffic Safety Committee meeting. While many of the comments resulted in changes to the text, the following responses are provided for ease of tracking how each comment was addressed.

AMCAL Equities, LLC, June 21, 2016

#1 Consideration was given to the comment and supporting evidence that the trip generation rate applied is not appropriate for student housing. As noted in the study, trip generation information for several universities was reviewed and determined to be sufficiently close to the apartment rate that there was no justification for creating use-specific rates. Further, the projection that 800 students would generate only 121 trips during the morning peak hour and 150 during the evening peak hour appears reasonable in consideration of not only trips to and from the university, but also to and from employment as many students also hold part-time jobs.

#2 The trip generation rate developed was based on a small sample of data, with all of the data collected on a single day. Because student schedules vary so substantially, it is unknown if a Thursday is representative of the average, so this data is insufficient as a basis for modifying the trip generation applied in the study. As discussed with staff, the decision was made to retain the analysis as originally prepared based on trip generation rates for an apartment use.

Caltrans District 1, June 24, 2016

#1 We understand that the City has ongoing communications with Humboldt State University (HSU) and that participation by HSU in any fee program or other methodology for obtaining funding for intersections along their boundary will be discussed, if appropriate.

#2 We concur with the recommendation that the City work with project proponents on managing travel demand. Text has been added to the traffic study regarding this issue.

#3 It is understood that considerable additional analysis will need to be performed, together with community outreach and other steps, prior to implementing any changes at Sunset Avenue/US 101 North. For the purposes of this study it was only deemed necessary to determine feasible improvements and develop planning-level cost estimates so that appropriate fees could be acquired from developers contributing traffic to this interchange. These fees can be applied to other improvements identified by Caltrans if the recommended changes are determined not to be the preferred alternative through further analysis.

#4 We now understand that the intersection of Sunset Avenue/LK Wood Boulevard is under the jurisdiction of HSU, and due to concerns relative to pedestrian safety the proposed short-term modifications no longer

include the northbound left-turn lane, but instead include median islands protecting the pedestrian crossing of the US 101 North off-ramp. HSU does not have an adopted level of service standard, and because operation at this location is no longer subject to either the City or Caltrans standards changes to operation cannot be deemed significant. The traffic study has been updated to reflect this change in approach.

Traffic volume data used for the analysis as well as the SIDRA files will be provided to Caltrans.

The analysis performed for Future Conditions was based on increased volumes, as indicated by the increase in average delay between existing and future conditions. The figure incorrectly showed the exiting volumes, but has been corrected.

While a Peak Hour Factor (PHF) of 1.0 was used for future conditions, the actual factors were used for existing conditions, though it is noted that a "floor" of 0.90 was applied. This approach was discussed with and approved by City staff to avoid over-designing to provide capacity for a surge in traffic that affects the roadway for only a short period of time.

As indicated in the traffic study, the conceptual roundabout designs were developed to determine if a roundabout is feasible, and if so it allowed preliminary cost estimates to be prepared. As noted in #3 above, substantial additional work would be needed to flesh out design concepts such as the diameter as well as accommodations for pedestrians and bicyclists at such time as a final design is selected.

#5 As noted above, the Future Conditions analysis was based on volumes increased based on the growth factor provided by Caltrans. While these growth factors could reasonably be expected to include the trips associated with all six of the projects studied, the analysis conservatively added these project-generated trips on top of the factored future volumes. Given the City's desire to avoid application of a lower PHF that could result in expanding facilities to provide capacity necessary for only short periods of time, together with the conservative nature of the volumes, the finding that operation is expected to remain at LOS C appears reasonable, so the requested reanalysis was not performed.

#6 See response to comment #3.

#7 We concur with Caltrans' concerns regarding installing improvements that may later become obsolete; however, given that the timing for further improvements is unknown, and it could be many years before such a project is constructed, we believe that it is in the public's best interest to implement the recommended modifications to improve pedestrian and bicyclist safety in the interim.

#8 Comment noted. As discussed above, the recommended improvements are conceptual in nature and will require substantial additional analysis prior to implementation. The intersection is currently all-way stop-controlled and projected to operate at LOS F without project trips under future volumes. With the conceptual improvement, a miniature roundabout, the intersection is expected to operate at LOS A.

Humboldt State University, October 15, 2016

#1 In deference to the University's concerns regarding the proposed installation of a left-turn lane on the northbound LK Wood Boulevard approach to Sunset Avenue, this option has been dropped.

#2 In deference to the University's concerns regarding the location of the bicycle lane on the west leg of the Sunset Avenue approach to LK Wood Boulevard, the recommended improvement has been replaced with an option that provides improved delineation and separation for pedestrians and bicyclists.

#3 See response to comment #2.

Caltrans District 1, Letter #2, February 24, 2017

#1 Comment noted.

#2 We concur that high-visibility markings would have a positive effect in terms of improving pedestrian safety.

#3 Comment noted.

#4 Comment noted.

#5 In response to Caltrans' lack of support for the proposed improvements an interim proposal that would accomplish the proposed separation with striping rather than curbs is now recommended. See Figure 18.

#6 We understand that the City would support installation of the improvements as discussed by Caltrans and shown conceptually in Figure 18.

#7 Comment noted.

#8 Comment noted.

Other Public Comments

#1 The turning radii for trucks at K Street/11th Street was evaluated as suggested, and it was determined that trucks would not be able to make the turns without using the wrong entry lane (turning right from either a through or left-turn lane) and/or crossing over the centerline of the street being turned in to. While adequate turning radii could be achieved by increasing the curb return radii on all four corners, this would require modification of the building on the southwest corner and would result in increased crossing distances for pedestrians on all four approaches. Because the turn lanes could only be accommodate if the bike lanes were eliminated, the modification would also result in negative impacts on bicycle facilities. Given the negative effects on both pedestrians and bicycles, under the criteria applied it was determined that no modifications should be made.

#2 Comment noted.

#3 We concur that the multi-use path is needed as soon as possible to accommodate pedestrian and bicycle traffic generated by the Village project. It is understood that the pathway would be built as part of the Village project. The limits of the pathway built by the project would start east of the Sunset Avenue/Foster Avenue-Jay Street roundabout and follow the railway track to the project site location to the north.

#4 Comment noted.

#5 The trip generation rate was based on standard rates for apartments, though research was first performed to determine if there is data available regarding traffic patterns at university housing. As noted in the traffic study, the data reviewed indicated a similar rate as is found for apartments, hence these rates were used. See also AMCAL #1.

#6 In order to provide turn lanes at 11th Street/K Street it would be necessary to eliminate some existing parking; there are no plans to replace this parking elsewhere. Similarly, the bike lanes would end in advance of the intersection and cyclists would need to merge with traffic on the approach to the intersection. Given

that all traffic is stopping, speeds are low so cyclists should not find it difficult to join the stream of stopping traffic. Markings to "share the lane" at that point could also be installed if the City desires. Although the City currently does not consider signalization as a preferred option, this alternative could be considered at such time as volumes increase to the point where the recommended changes are needed. See also OPC #1.

#7 The roundabout is recommended for the intersection at Sunset Avenue/LK Wood Boulevard under projected future volumes, and short-term conditions are the focus of the findings on Page 28. However, the text quoted is relative to the intersection of LK Wood Boulevard with the US 101 overpass to the north, not the intersection at Sunset Avenue.

While Sunset Avenue/LK Wood Boulevard and Sunset Avenue/US 101 North are so closely spaced that they may be perceived as a single intersection, they are in fact two intersections controlled by different agencies. The long-term recommendations for either intersection must also include the other because their operation is so inter-related.

Further analysis will need to be performed prior to pursuing closure of the G Street connection to US 101 North. At this time the design is purely conceptual in nature, so specific design questions cannot currently be addressed.

Comment noted. The City has not expressed a desire to use LOS D as their operational threshold.

The left-turn lane on northbound LK Wood Boulevard at Sunset Avenue has been eliminated from consideration due to opposition by Humboldt State University. However, modifications are recommended to improve pedestrian and bicyclist safety, and these interim improvements would be "scrapped" at such time as a roundabout is constructed.

#8 The traffic study includes an evaluation of each project individually so that specific improvements needed with some projects but not others were identified.

#9 See AMCAL #1.

#10 The distribution percentages were developed based on existing volumes as well as the probable path from each project site to various destinations; for the Creekside project the assumptions were further modified to reflect the potential extension of Foster Avenue. These assumptions were reviewed and approved by staff.

#11 Comment noted.

#12 In preparing this study there was a specific emphasis on providing adequate facilities for pedestrians and bicyclists as well as trying to ensure that the City was planning ahead to construct improvements to increase capacity for vehicular traffic where it is expected to be needed. Further, information regarding VMT was generated and provided to City staff, though as there are currently no standards against which to measure changes, this information is not included in the traffic study. Finally, pedestrian and bicyclist safety was given priority over driver delay at Sunset Avenue/LK Wood Boulevard where changes as now proposed do not reduce delay but rather improve safety conditions for pedestrians and cyclists.

#13 The collision rate indicated for the intersection of Foster Avenue/Alliance Road represents conditions prior to installation of the modern roundabout.

#14 See OPC #10. It is further noted that the proposed improvements without any of the projects are essentially the same as with each of the projects individually as well as with all of the projects. Changing the distribution would therefore be unlikely to result in any changes to the conclusions and recommendations.

#15 Comment noted. Since the LOS thresholds are not an adopted standard, the City has discretion as regards the specific improvements that any individual project could be required to construct. However, since both proposed modifications are minor striping changes, it does not appear unreasonable to require that Creekside construct these improvements if they trigger their need.

#16 Text corrected.

#17 Standard trip generation rates account for use of alternative modes in that when counts are performed to determine trip generation rates there are trips made by pedestrians and bicyclists that would otherwise be included in the trip counts and result in higher trip generation rates. Further explanation has been added to the text.

#18 Text updated.

Please let me know if there are any questions regarding these responses.

Sincerely,

Dalene J. Whitlock, PE, PTOE
Principal

DJW/djw/ARC014.R2C.L1

APPENDIX T.1

AMCAL

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June 21, 2016

Alyson Hunter
Senior Planner
Community Development Department
City of Arcata
736 F Street
Arcata, CA 95521

Re: Central Arcata Areawide DRAFT Traffic Impact Study

Ms. Hunter:

AMCAL #1 AMCAL Equities thanks the City of Arcata for the opportunity to comment on the draft traffic analysis. The W-Trans report states "The Village, Canyon Creek, Sunset Terrace and Twin Parks projects were evaluated using the trip generation rates for "Apartments" (ITE LU#220)". We disagree with applying standard rates for "Apartments" to the Village. Our experience with purpose-built student housing shows trips generated by student housing vary from trips generated by a generic apartment building. In particular, student housing trip generation depends upon unique demand drivers: proximity to campus, adequate pedestrian/bike paths, walk time to class, on-campus parking availability and cost to park. All of these drivers apply to the Village and will impact trip generation rates. Anyone who has attempted to find parking on the Humboldt State University campus learns quickly it is better to walk, bike or take public transportation to campus than drive.

AMCAL #2 Several studies have documented student housing generates approximately one third the amount of traffic as compared to a similarly sized, generic apartment building. As an example, attached please find a Technical Memorandum by Spack Consulting about their findings after studying student housing surrounding the University of Minnesota. The table below

summarizes the study's findings of average trip generation rates for student housing and apartments.

	Student Housing	**Apartment from Trip Generation, 8th Edition**
Weekday	2.82	6.65
Weekday A.M. Peak Hour (between 7-9 a.m.)	0.13	0.51
Weekday P.M. Peak Hour (between 4-6 p.m.)	0.24	0.62

Based on this evidence, we request further consideration be given to the trip generation rate that would be appropriate for the Village student housing project.

Thank you,

Stephen Clarke
AMCAL Equities, LLC

CC David Moon
Patrick Shanahan
David Loya
Netra Khatri
Karen Diemer

Spack CONSULTING
THE TRAFFIC STUDY COMPANY

Technical Memorandum

From: Mike Spack, P.E., P.T.O.E., Lindsay deLeeuw
Date: April 12, 2012
Re: Trip Generation Study – Private Student Housing Apartments

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A recent spike in new construction surrounding the University of Minnesota led to an interest in determining how trips generated by student housing apartments vary from trips generated by a generic apartment building (as defined by ITE's *Trip Generation, 8th Edition* Code 220). This report provides trip generation data for six student housing apartment buildings. Weekday daily, a.m., and p.m. peak hour trip generation rates are provided. In additon to providing trip generation rates per Dwelling Unit (as in *Trip Generation*), trip generation data is also provided based on number of bedrooms and number of parking stalls.

Overall, it was found student housing apartments generate approximately a third the amount of traffic compared to a similarly sized, generic apartment building. Using ITE's guideline of preparing full traffic impact studies only if a development will generate more than 100 peak hour trips, a student housing apartment complex would need to have 416 dwelling units to trigger the need for a full traffic impact study.

Methodology

Data was collected on Thursday, March 29, 2012 (while school was in full session) at six typical student-housing apartment buildings near the University of Minnesota – Twin Cities using COUNTcam video recording systems. Each building is specifically designated for students by the property managers but none are directly associated with the university. The range of total apartment units is 44 to 253, with an average of 118, and the apartment types vary from studios to four-bedroom units. Additionally, all the buildings observed have parking with the number of stalls ranging from 40 to 135, with an average of 57 stalls.

The parking lot for each student housing apartment building was recorded for 24 hours on a weekday (multiple cameras were used for parking lots with more than one entrance or exit). The videos were watched at high speeds with the PC-TAS counting software and the vehicles in and out were tallied in 15-minute intervals.

Findings

Statistics and data plots for each trip generation period studied are attached. A summary of the student housing average trip generation rates is shown in Table 1 alongside the trip generation rates for Apartments from the Institute of Transportation Engineers' *Trip Generation, 8th Edition* (ITE Code 220).

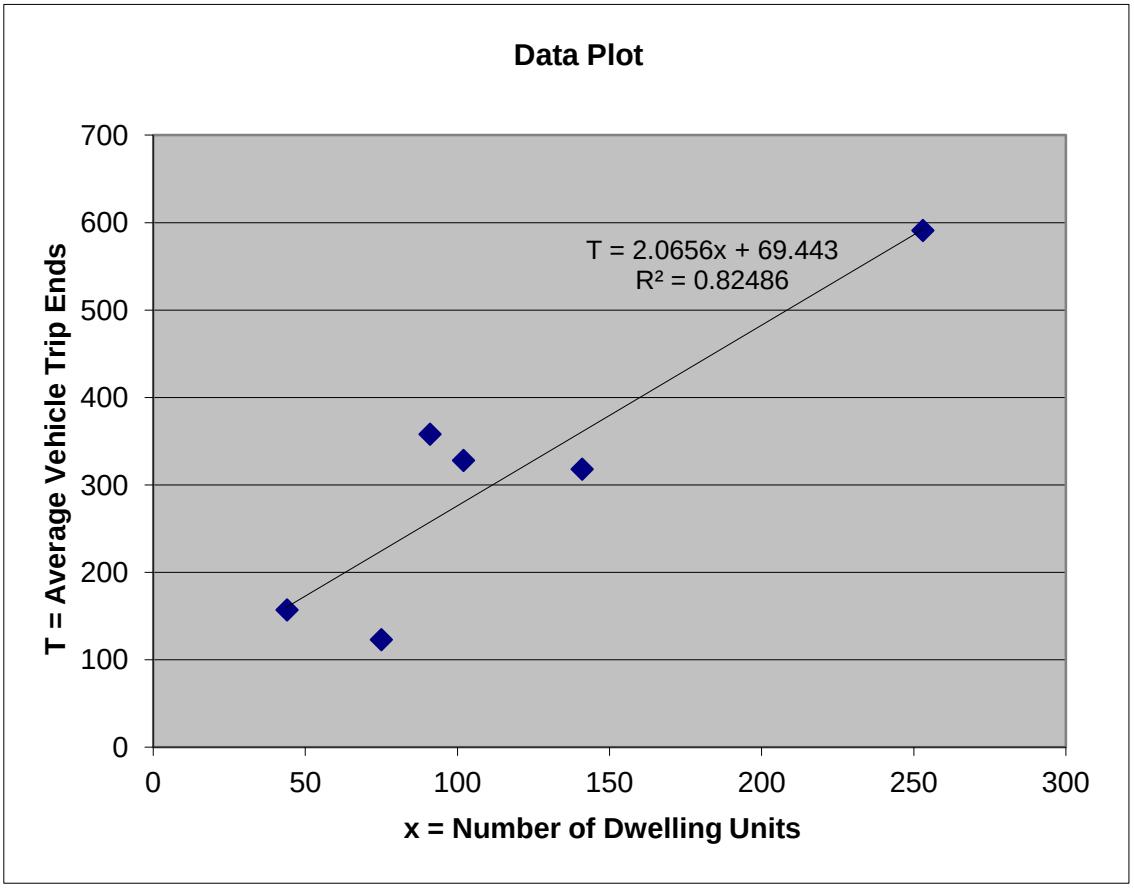
Student Housing Apartment Building

Average Vehicle Trip Ends vs: Number of Dwelling Units
On a: Weekday

Number of Studies: 6
Average Number of Units: 117.67
Directional Distribution: 50% Entering
50% Exiting

Trip Generation per Number of Dwelling Units

Average Rate	Range of Rates	Standard Deviation
2.82	1.64-3.93	0.88



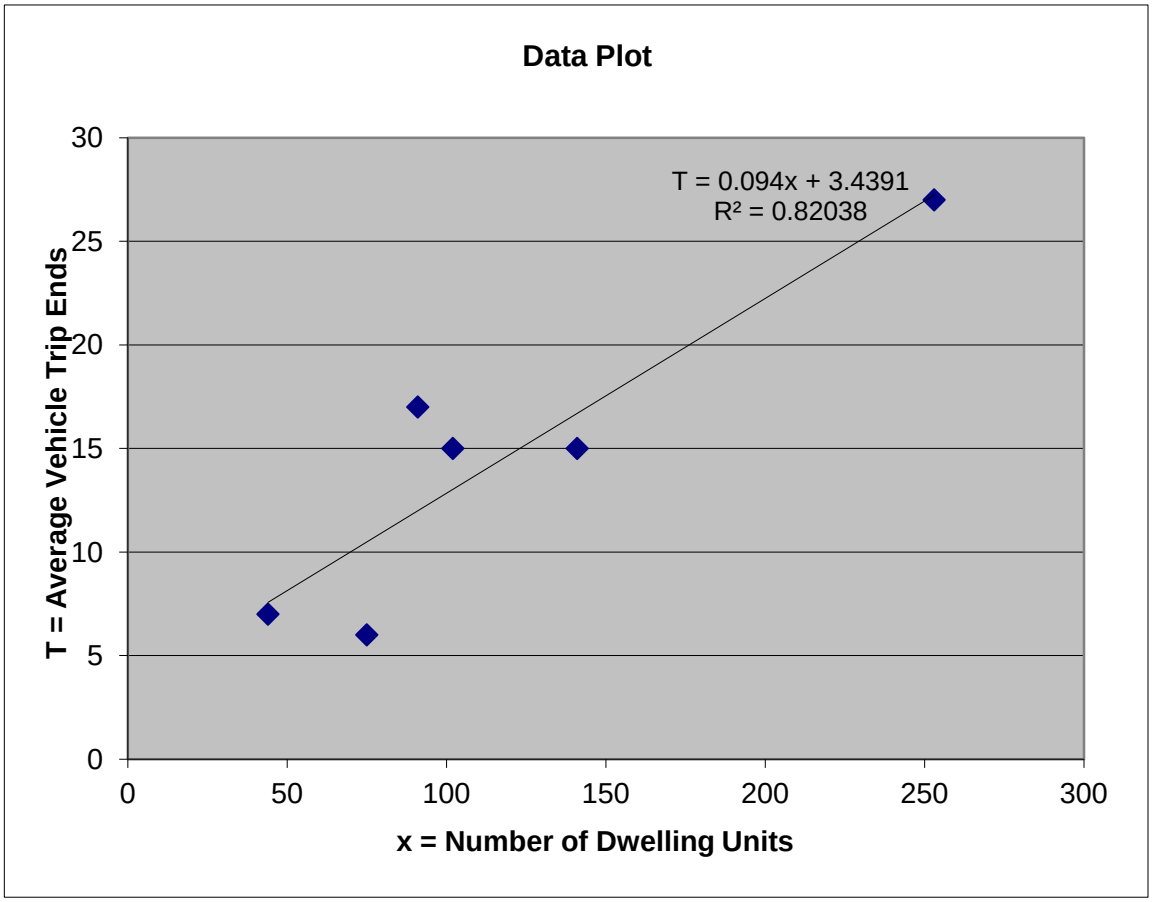
Student Housing Apartment Building

Average Vehicle Trip Ends vs: Number of Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Number of Studies: 6
Average Number of Units: 117.67
Directional Distribution: 39% Entering
61% Exiting

Trip Generation per Number of Dwelling Units

Average Rate	Range of Rates	Standard Deviation
0.13	0.08-0.19	0.04



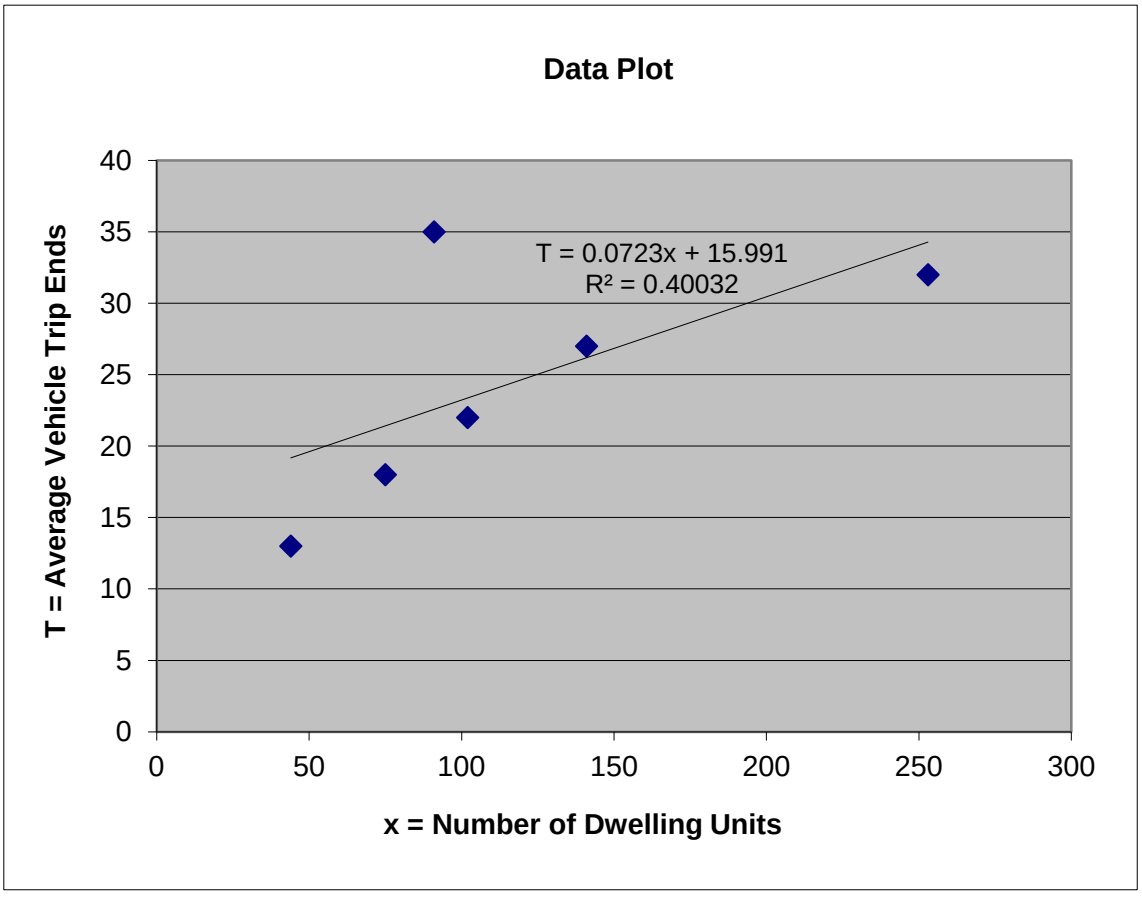
Student Housing Apartment Building

Average Vehicle Trip Ends vs: Number of Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Number of Studies: 6
Average Number of Units: 117.67
Directional Distribution: 54% Entering
46% Exiting

Trip Generation per Number of Dwelling Units

Average Rate	Range of Rates	Standard Deviation
0.24	0.13-0.38	0.09



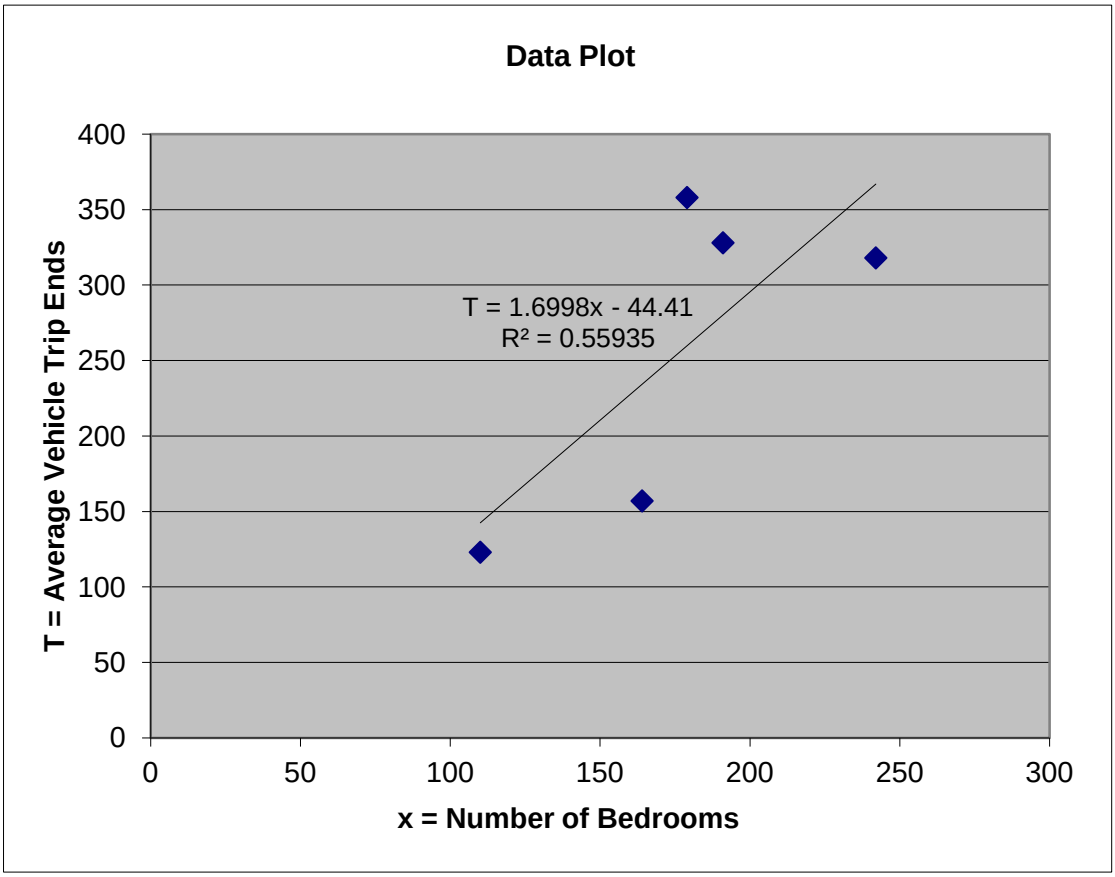
Student Housing Apartment Building

Average Vehicle Trip Ends vs: Number of Bedrooms
On a: Weekday

Number of Studies: 6
Average Number of Units: 147.67
Directional Distribution: 50% Entering
50% Exiting

Trip Generation per Number of Bedrooms

Average Rate	Range of Rates	Standard Deviation
1.42	0.96-2.00	0.43



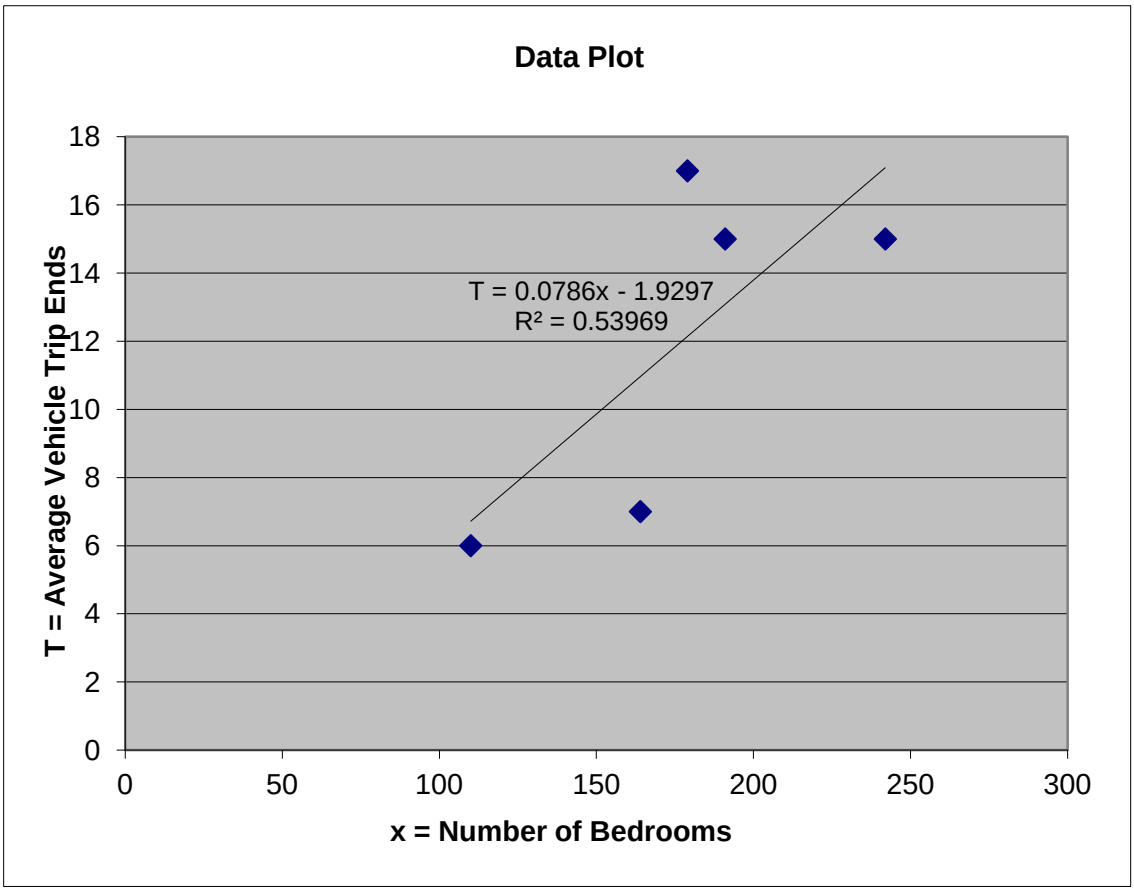
Student Housing Apartment Building

Average Vehicle Trip Ends vs: Number of Bedrooms
On a: Weekday,
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Number of Studies: 6
Average Number of Units: 147.67
Directional Distribution: 43% Entering
57% Exiting

Trip Generation per Number of Bedrooms

Average Rate	Range of Rates	Standard Deviation
0.07	0.04-0.09	0.02



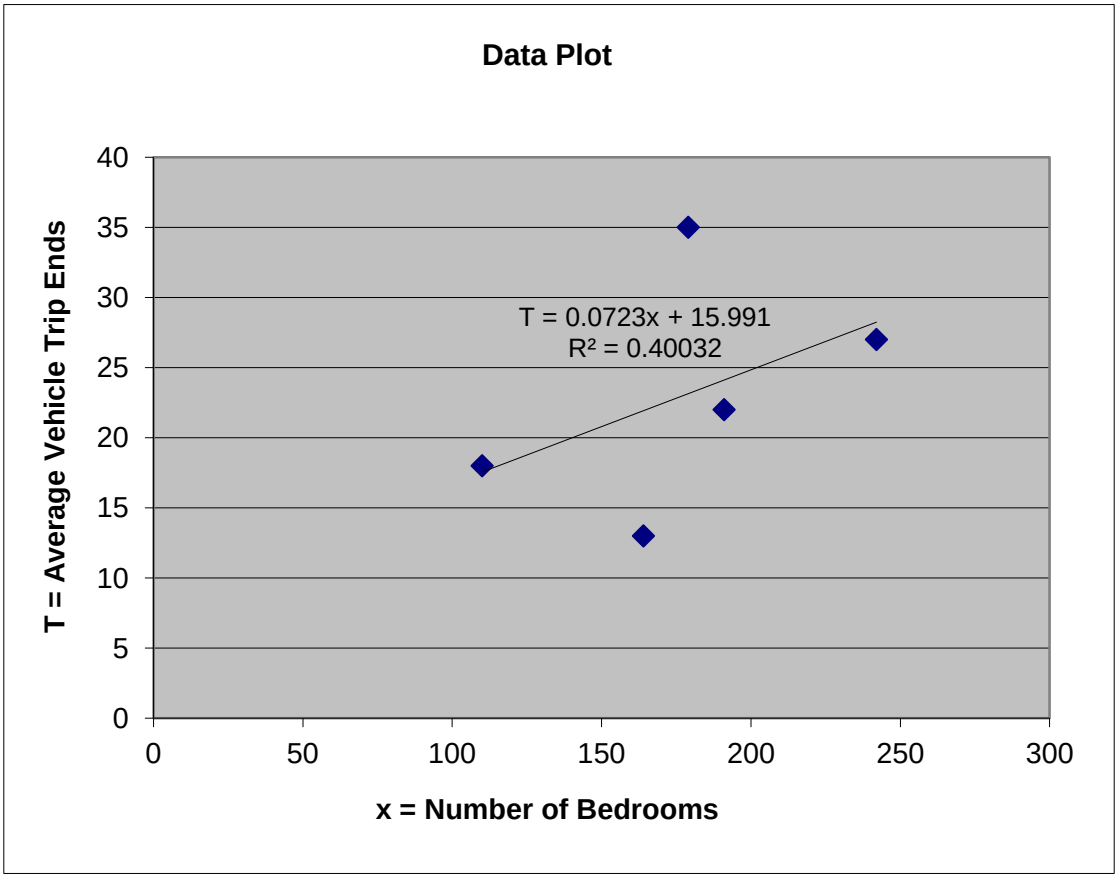
Student Housing Apartment Building

Average Vehicle Trip Ends vs: Number of Bedrooms
On a: Weekday,
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Number of Studies: 6
Average Number of Units: 147.67
Directional Distribution: 53% Entering
47% Exiting

Trip Generation per Number of Bedrooms

Average Rate	Range of Rates	Standard Deviation
0.13	0.11-0.20	0.05



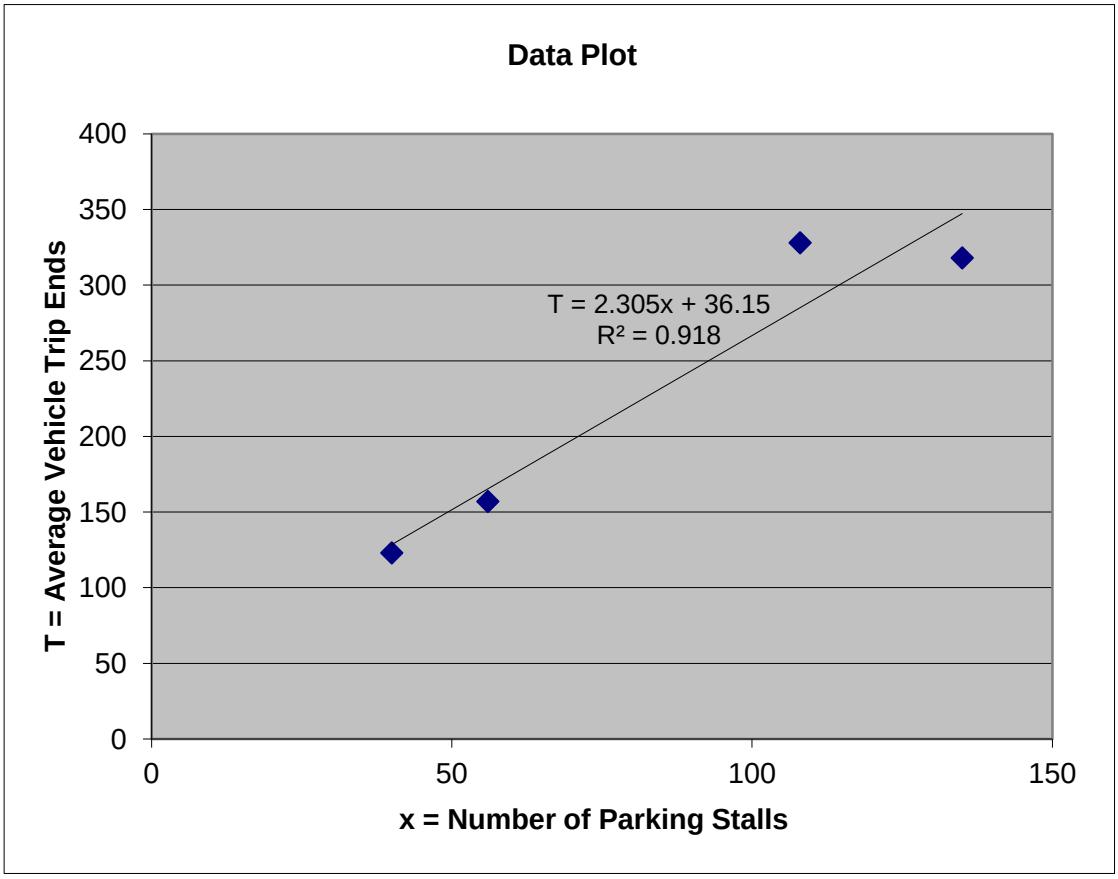
Student Housing Apartment Building

Average Vehicle Trip Ends vs: Number of Parking Stalls
On a: Weekday

Number of Studies: 6
Average Number of Units: 56.50
Directional Distribution: 50% Entering
50% Exiting

Trip Generation per Number of Parking Stalls

Average Rate	Range of Rates	Standard Deviation
2.82	2.36-3.08	0.33



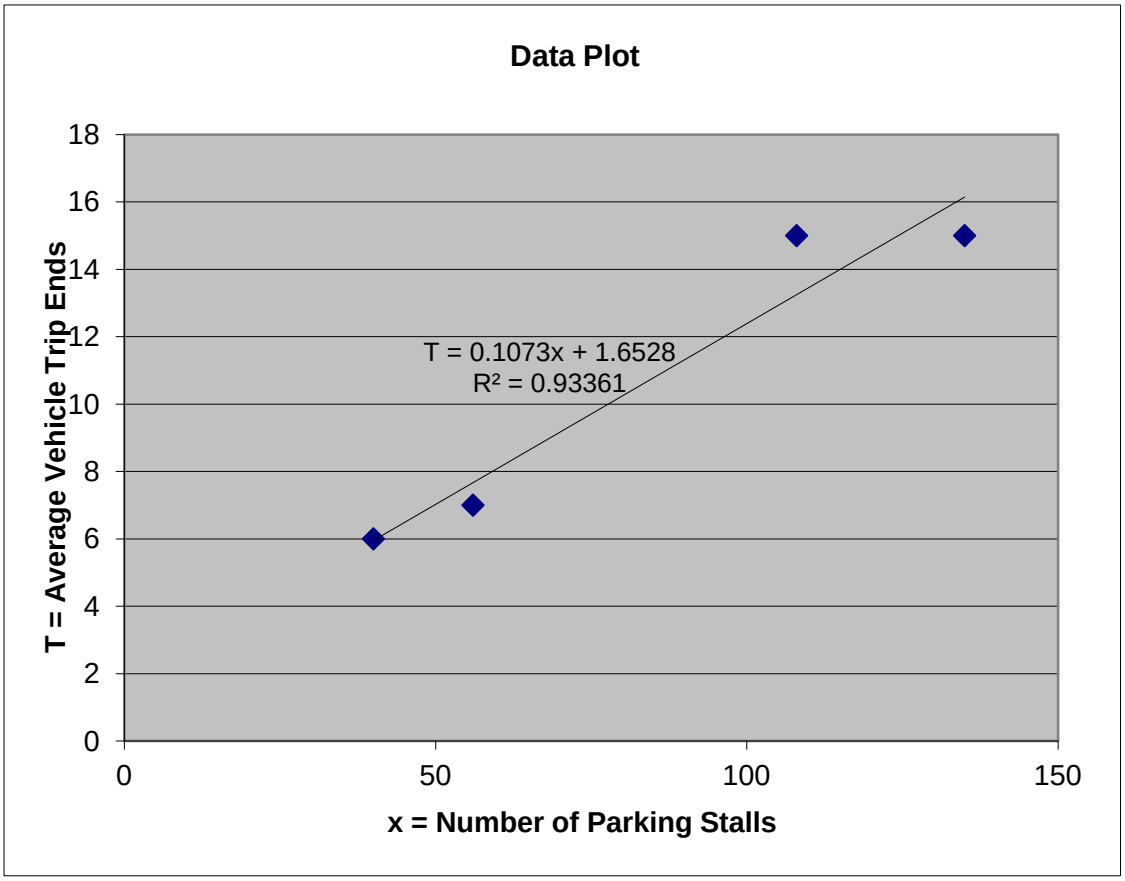
Student Housing Apartment Building

Average Vehicle Trip Ends vs: Number of Parking Stalls
On a: Weekday,
Peak Hour of Adjacent Street Traffic
One Hour Between 7 and 9 a.m.

Number of Studies: 6
Average Number of Units: 56.50
Directional Distribution: 47% Entering
53% Exiting

Trip Generation per Number of Parking Stalls

Average Rate	Range of Rates	Standard Deviation
0.13	0.11-0.15	0.02



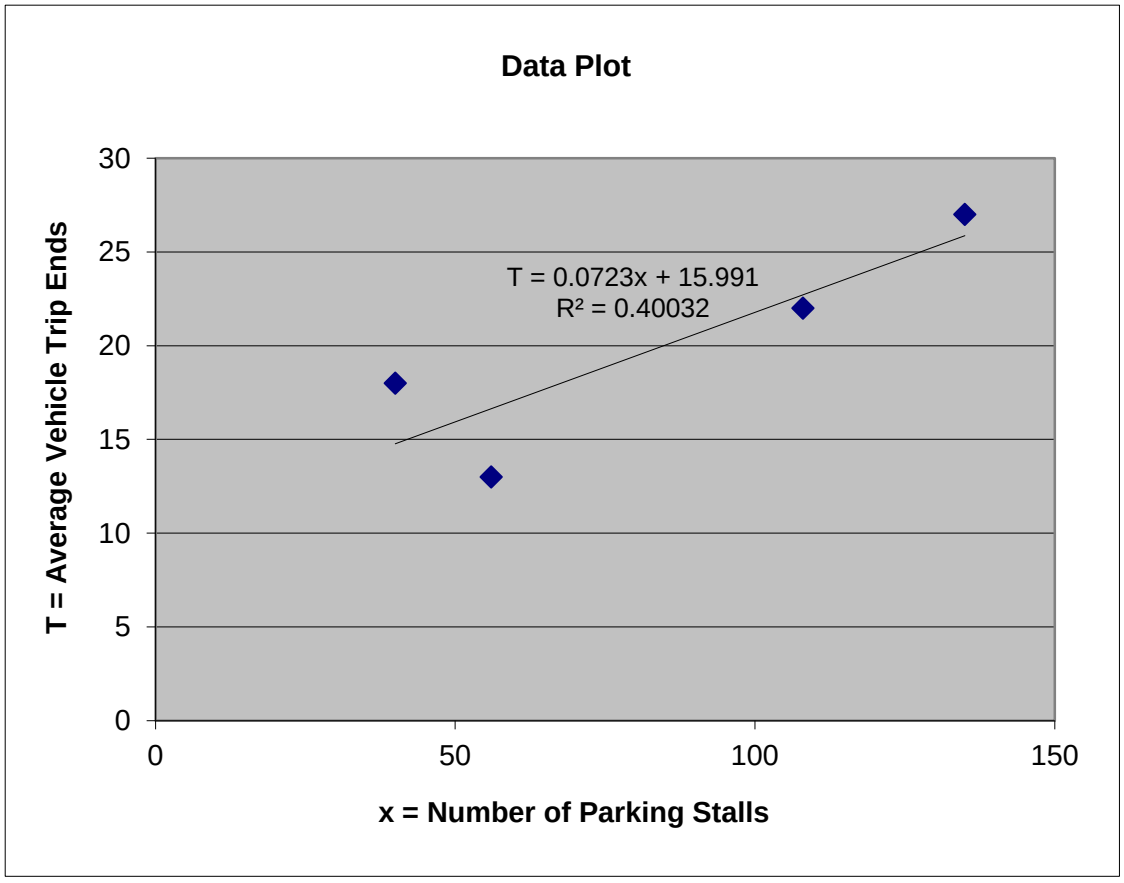
Student Housing Apartment Building

Average Vehicle Trip Ends vs: Number of Parking Stalls
On a: Weekday,
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Number of Studies: 6
Average Number of Units: 56.50
Directional Distribution: 54% Entering
46% Exiting

Trip Generation per Number of Parking Stalls

Average Rate	Range of Rates	Standard Deviation
0.27	0.20-0.45	0.12



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DEPARTMENT OF TRANSPORTATION
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Serious Drought
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June 24, 2016

1-HUM-101-86.94
Central Arcata Areawide Traffic Impact Study

Alyson Hunter, Senior Planner
Community Development Department
City of Arcata
736 F Street
Arcata, CA 95521

Dear Ms. Hunter:

Thank you for giving Caltrans the opportunity to review and comment on the Central Arcata Areawide Traffic Impact Study (TIS). The study considers the potential for traffic impacts to result from the approval of six development proposals in the vicinity of both Sunset and Foster Avenues. The development proposals are moving forward on independent timelines but are consistent with the City's growth projections of 1.5% per year, over a 20-year period. Four of the six development proposals ("The Village", " Sunset Terrace", "Canyon Creek", and "Twin Parks") are expected to house students of Humboldt State University to a greater or lesser extent and generate or attract trips for a mix of travel modes, including vehicular, bicycle, pedestrian and transit modes. We have the following comments:

CT #1

- Caltrans supports the City in the development of a fair-share development fee program to collect traffic impact mitigation for cumulative traffic impacts. In addition to collecting fair-share fees from the residential developments that will generate new trips, we encourage the City to seek participation from Humboldt State University as a trip attractor for a large number of trips. The University prepared a traffic impact study for a Facilities Master Plan sometime in the last decade, which identified traffic impacts and the need for traffic mitigation as part of the long-term increases in student enrollment.

CT #2

- To reduce the need for increases to the existing roadway capacity, we recommend working with the proposed developers to manage travel demand. Some travel demand management strategies that the City could consider employing for the central Arcata area include:
    - Promoting active travel with new development by providing bicycle parking for each residential unit in addition to, or in place of, vehicular parking;
    - Providing unbundled vehicle parking for residential tenants;
    - Offering rideshare forums;
    - Offering car-share services; and,

- Providing residents or employees with monthly transit passes.

CT #3

- Prior to any approval granted by Caltrans for the proposed intersection improvement at LK Wood Blvd/Sunset Ave/NB Route 101 ramps, the City will need to conduct an Intersection Control Evaluation (ICE), per Caltrans protocol to determine the appropriate method of intersection control. Caltrans may determine that a traffic signal is the most appropriate intersection control device, in conflict with City policy to construct roundabouts. Under such a scenario, Caltrans and the City would likely need to enter into a maintenance agreement to equitably assign operational and maintenance costs and liability.

CT #4

- Some additional analysis will be needed for Caltrans to agree with the recommendations of the TIS. The following data and analysis can be provided either when the TIS is revised, when the Intersection Control Evaluation is completed or, possibly, when fair share fees are calculated:
  - A more detailed look at intersection operations for Sunset Avenue and LK Wood Boulevard may also reveal the compatibility of the proposed left-turn channelization with the long-term improvement for the intersection.
  - We request to see the raw volumes for the study area. Humboldt State University attracts students, faculty, staff and other trips throughout the day. A review of the volume charts will enable us to validate that the daily peaks actually occur during the standard business peaks of 7-9am and 4-6pm.
  - The Southbound U.S. 101 off-ramp volumes did not change under the existing and future conditions scenarios. The analysis of this intersection will need to be performed again, using Caltrans growth factors to adjust the traffic volumes for future conditions.
  - The peak hour factors were set to 1.00 for all movements on all the models. This ignores the severity of surges in traffic volumes. After an initial examination of our ramp data from June 23, 2013, which is during the high school and college summer break, the 7-8 AM hour showed a 72% peak-hour factor for the southbound off ramp, and 67% for the northbound off ramp. These variations in peak hour factors of these magnitudes have significant effects on the traffic model outputs.
  - Caltrans requests to review the analysis of roundabout operations (SIDRA files).
  - An initial look at the preliminary design of the roundabout indicates that the diameter of the circulatory roadway will need to be enlarged. Increasing the deflection upon entry of the circulatory roadway should reduce the speeds to approximately 18 to 25 miles per hour.

- The roundabout design will need to consider bicycle and pedestrian interactions and/or crossings to minimize the number and severity of possible conflicts with motor vehicles.

CT #5

- Some of the assumptions in the TIS may not have resulted in the identification of potential impacts to the southbound (SB) U.S. Route 101 ramps. Using existing and projected bicycle and pedestrian counts/volumes, adding State growth factors for projected volumes on Route 101, adjusting the peak hour factor from 7 AM to 8 AM based on observed 15-minute counts, and an examination of traffic safety are likely to result in the need for mitigation at the SB 101 ramp intersection as well. Caltrans requests a re-evaluation of traffic impacts under future conditions at the SB Route 101 ramps prior to resolving traffic mitigation for the Sunset Avenue corridor.

CT #6

- As part of the design of the roundabout proposed for the five-legged intersection on Sunset Avenue at LK Wood Boulevard and the NB 101 ramps, the TIS recommends closing the link from the NB 101 onramp at G Street to the NB 101 off ramp at Sunset Avenue. The TIS acknowledges that traffic volumes for the G Street to LK Wood Boulevard movement are unknown. Additional data collection and analysis will be needed to support the TIS recommendations. We would also need to know how additional volumes from the closure of the G Street overcrossing will affect the operation of the intersection.

CT #7

- Under the 20-year horizon traffic volume projections, the TIS proposes to address operational deficiencies at both the LK Wood Boulevard/Sunset Avenue intersection and the NB U.S. Route 101 ramp intersections at Sunset Boulevard jointly by constructing an intersection improvement for a five-legged roundabout. This improvement would render obsolete, the short term left-turn pocket proposed at LK Wood and Sunset Avenue. We recommend structuring development mitigation to focus on the 20-year horizon improvement needs to avoid short-changing the long-term needs in favor of addressing short-term fixes with a limited operational lifespan. Any arrangement to exact mitigation measures or collect fair-share mitigation fees should be structured to maintain maximum flexibility until long-term capital improvement needs have been definitively identified.

CT #8

- The preliminary design of the roundabout proposed for the Foster Avenue and Alliance Boulevard intersection may result in worse performance than under a four-way stop-controlled intersection due to the presumed low speed of travel within the circulatory roadway. Caltrans recommends conducting an operational analysis for the resulting intersection following a more detailed design of the facility.

Caltrans Transportation Planning requests to cooperate in the planning, analysis and design of the improvements considered for the Sunset Ave corridor and vicinity to ensure a more seamless and functional transportation network. Please contact Kevin Tucker with questions or for further assistance while I am away from the office. Kevin may be contacted through reply to this message or by telephone at (707) 441-5770.

Sincerely,

Jesse Robertson
Associate Transportation Planner
District 1 Transportation Planning

CC: Netra Khatri, Assistance City Engineer, City of Arcata

HUMBOLDT STATE UNIVERSITY

Facilities Management

707 826-3646 PHONE
707 826-5888 FAX
facsmgmt@humboldt.edu EMAIL
707 826-4475 ALT

October 15, 2016

Netra Khatri
City of Arcata
Public Works
736 F Street
Arcata, CA 95521

Delivered via email to nkhatri@cityofarcata.org

Dear Netra,

The University understands that the City of Arcata undertook a Central Arcata Area-wide Traffic Impact Study for the purposes of determining road infrastructure improvements to address impacts to level of service. Additionally, we understand this Study is also being utilized with regard to potential off-site mitigations to be performed by developers with respect to residential housing projects which may occur in that area of the City over time. While we would have preferred the opportunity to provide input regarding those improvements which affect University property during that time the draft Traffic Study was being created (especially concerning proposed improvements on University property), we appreciate the opportunity to provide such at this time. Furthermore, we appreciate the efforts your Department has shown toward taking into consideration the University's informally communicated concerns with regard to your draft of two additional options for the Sunset and LK Wood intersection.

The University has reviewed each of the options presented and offers formal comments regarding such as follows:

HSU #1

- Original Design: The University does not support this solution. It is our opinion that the solution introduces additional traffic into an already very busy and confusing intersection. We also believe this design is focused on increasing the level of service for motor vehicles and does not adequately take into account the level of service nor safety concerns for pedestrian and bicycle traffic. The University views the level of service issue concerning motor vehicles is confined to specific periods during the day (primarily morning and at the end of each workday) but that safety concerns for pedestrian and bicycle traffic are present throughout the day and evening.

HSU #2

- Sunset & LK Wood Option 1 (with bicycle lane to south): The University does not support this solution. It is our opinion the solution introduces additional complexity regarding the south turn onto LK Wood which may have a negative impact on pedestrians; we also believe this solution is complex in terms of motor vehicle and bicycle interface which can also negatively impact safety.

HSU #3

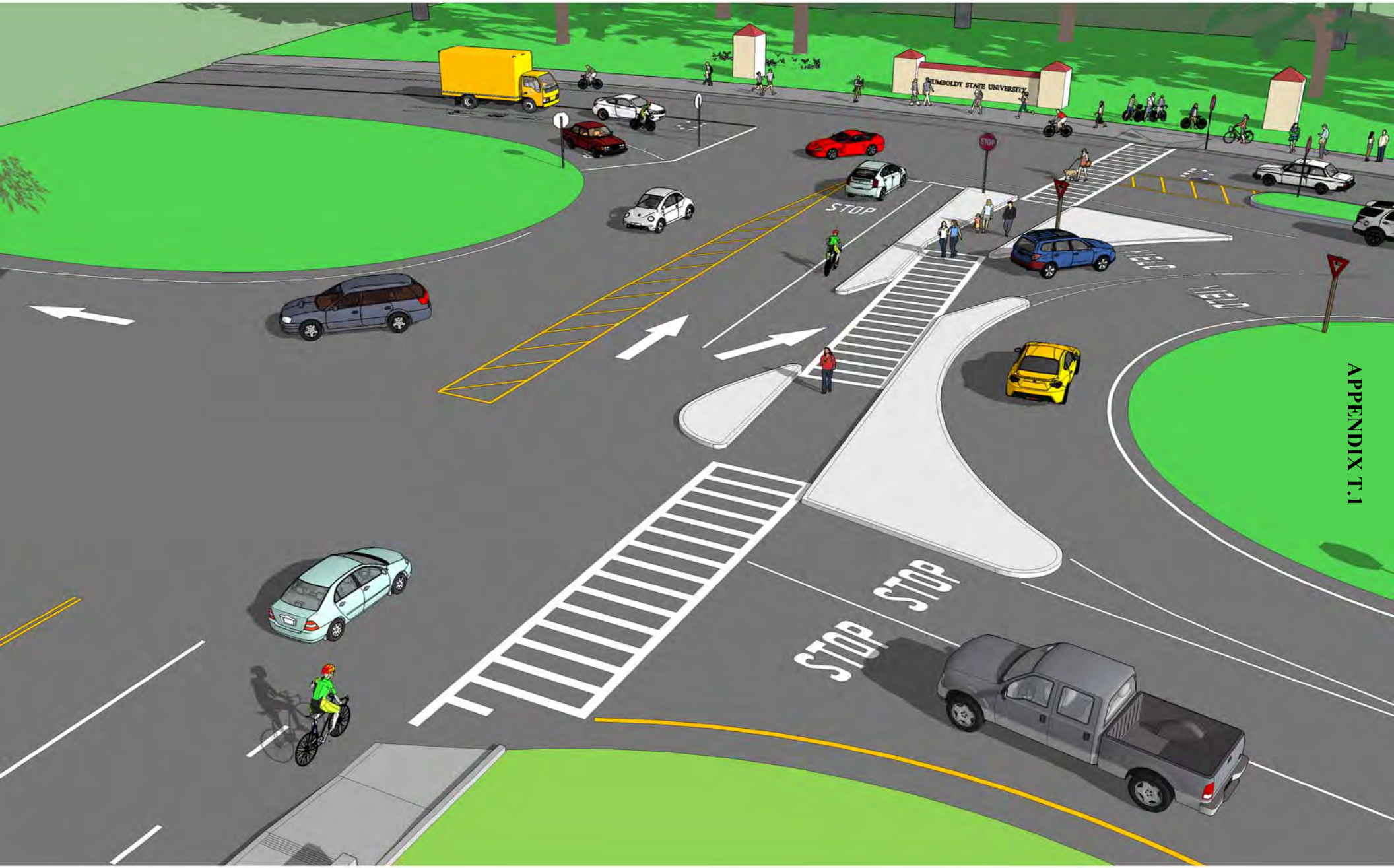
- Sunset & LK Wood Option 2 (with bicycle lane to east): The University strongly prefers this option as it provides for increased levels of safety for pedestrian and bicycles while also supporting the efficient flow of motor vehicles. We prefer this option to be further explored to include increase bicycle transportation road markings and to support cyclists turning to the south or north on LK Wood as well as proceeding directly east onto the campus. Our preferred options is attached.

Should you have any questions or require further clarification regarding the University's expressed comments or preferences, please feel free to contact me at the office. In addition, please notify the University of any meetings and/or discussions regarding City plans, studies or projects (whether schematic or final design) which may impact or occur on University property. We are interested in ensuring we participate in the process as well as work in partnership with the City to improve Arcata as a whole.

Regards,

Traci Ferdolage
Associate Vice President, Facilities Management

Cc: Project File
Joyce Lopes, Vice President- Administrative Affairs
City Manager's Office
City of Arcata Transportation Safety Committee
City of Arcata Planning Commission



APPENDIX T.1

SUNSET AVE. & L.K. WOOD BLVD. VIEW LOOKING

Public/TSC comments

OPC #1 11th-K Street: I don't see the striping change recommendation to include turn lanes in all directions to be feasible as it could create further congestion and increasing the turn radius for trucks and other larger vehicles making a left or right. I'm not sure I care for a potential scenario where eight vehicles arrive at the intersection simultaneously waiting for one another to take their turn and go, though I'm not sure I could think of a better recommendation to address a sub LOS of C for the intersection. Creating more lanes and folks waving each other on is not my idea of a solution.

OPC #2 Village Apartments: I concur with the recommendation to include a 3-way stop at St Louis and Highway 101 overpass. The southbound left turn onto the overpass without any impedance has always been a bit confusing to me and will further complicate that intersection with increased traffic volume going and coming from the development.

OPC #3 Also, until the multi-use path is developed (what is the ETA on the path?), I would say that forcing 242 units of bicycle and pedestrian traffic down Eye-Jay Streets is going to be a challenge, as the report indicates there is no continuous sidewalk, forcing pedestrians into the road. In addition, much of the road is very narrow, blind in spots, meandering, and full of potholes. Living on Eye Street, I can also say that the whole area in under-lit and could potentially be a safety concern during the winter months for pedestrians and bicyclists when the sun is going down at 5 pm. The multi-use path development will eliminate most of my concerns.

OPC #4 Sunset-LK Wood-101 NB off-ramp: I've felt that the left turn from the NB 101 off-ramp onto Sunset heading west is the most dangerous traffic movement in the City. It appears that the proposed roundabout will eliminate that turn.

OPC #5 Trip Generation analysis: The trip generation rate applied may not be a accurate account of the actual residents within these projects, as it would appear they would mostly be utilized by HSU students. In my opinion, these projects will reduce vehicular traffic flow and encourage other modal options. I'm not sure that is accounted for or recognized in their findings, maybe I missed it.

OPC #6

- 11th St/K St
  - Restriping seems like it would then be too crowded for parking in front of businesses at this intersection (Clothing Dock, Humboldt Thrift, Dutchy's pizza) not to mention the bus stop on 11th St.
    - Would a parking lot be paved somewhere to account for the lost parking? Where?
  - There seems to be no room for busses/trucks to make turns at all and visibility for cars may be diminished if people are still going to be parking along even part of the street.

- The bike lane would be nerve-wracking for both bikers and drivers, in my opinion. They mention they'd have to get rid of parts of the bike lane anyway—would this then include the whole street? Or would bikes have to merge into the traffic lanes at these points?
- A traffic signal might help alleviate confusion, as recommended on page 56.

OPC #7

- LK Wood/Sunset
  - Pg 28: "…drivers will experience little if any change in conditions as a result of the project": Is this in regard to the roundabout? If so, what's the point of the roundabout? Purely to alleviate confusion?
  - I'm not sure what they mean by "…long term any improvements to one of the intersections include the other," (pg 18).
  - Closing the existing G Street to 101N off ramp is a great idea in my opinion. Limited visibility and fast approaching cars coming off 101N make this a very hairy situation, currently. I use this route time I get groceries and it's never a relaxed situation
    - Would they be filling in the existing elevation difference to make the far right merge from the 101 off ramp onto LK Wood?
  - "The city could elect to use the LOS D operation as the acceptable standard," (pg 70) this is a bad idea in my opinion.
  - Would they install the left-turn lane on northbound LK Wood before installing the 5-legged roundabout? Or would they be scrapping one if they go with the other?

<u>Overall</u>

OPC #8

While the Study includes future with Project Buildout, the City should be looking at which projects are proposed to come on line right away and which will involve phasing to get a better idea of the timing for the need of some of the proposed improvements.

OPC #9

AMCAL submitted trip generation related to student designated units, which are much lower than standard apartment use generation. Staff seemed to discount these because they represent one day's worth of data. However, according to page 14 volume data was only collected for this study on March 3, 2016. Being a college town staff should recognize that a good number of the units will be lived in by students who will not be driving to HSU. The study should incorporate an alternative analysis where some reasonable percentage reduction is incorporated. If 30% of the units were occupied by students who didn't drive to school, or if their ADT were reduced by 30% because they didn't use a vehicle to get to school how would that change the projected LOS levels and the suggested improvements?

OPC #10

A closer look at the percentages of traffic expected to use the K Street and 11 th Street intersection is needed (see page 26). It seems to me that a higher percentage of traffic is suggested to use this route to Eureka than using the southbound Hwy 101 onramp.

OPC #11

The K Street and 11th Street intersection is an intersection I drive through daily. Though not striped many drivers already recognize that there is width available for two lanes at each of the four legs. Striping may be needed by the less wary driver who takes up the entire width. And even though truck turning movements may not be accommodated by the striping it seems a truck would straddle the line as needed, as they do elsewhere in town.

OPC #12

I understand that the purpose of the Study was to evaluate LOS changes. I believe that Public Works staff should include a staff report on the City's stance on LOS and capacity increasing improvements. I think there should be additional support for these housing projects when one thinks of the new metric in Vehicle Miles Travelled (VMT) rather than measuring aggravation waiting at intersections. Also shouldn't we be focusing more on ped/bike safety rather than LOS designs?

Specific Comments

OPC #13

Page 8. Noted are eight intersections that have collision rates above State averages; however for a number of these it only a slight difference. Only half of those notes are significantly higher. For the Foster Ave and Alliance were these before or after the recent improvements?

OPC #14

Page 26. These distribution assumptions should be looked at. These are also considering that most occupants in these projects will be driving the same as a non college town. There are insufficient parking spaces at HSU to accommodate all the drivers that are distributed to drive to HSU, for instance.

OPC #15

Page 37. It is noted that the Creekside Homes project causes unacceptable services levels at Alliance and 11th and Alliance and Foster. However the added traffic attributable to this project only exceeds the LOS C maximum wait time of 25 seconds by 1.1 and 2.2 seconds.

OPC #16

Page 59. McDaniel Slough reference should be changed to Janes Creek at this location.

OPC #17

Page 64, first paragraph. This discussion starts to suggest that the traffic volume portion of the Study didn't consider pedestrian or bicycle use but then begins to suggest that better facilities for bike/ped are needed. It is true that existing facilities are less than desirable. Here it suggests that the projects need to mitigate impacts by providing bike/ped improvements but there is no discussion of a reciprocal reduction of motor vehicles as a result.

OPC #18

Page 66. Creekside Homes. There are actually two pedestrian crossings; one at the south end and one at approximately the middle of the project. Again the reference to McDaniel Slough should be changed to Janes Creek.

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Serious drought.
Serious drought.
Help save water!

February 24, 2017

1-HUM-101-86.949
Central Arcata Areawide TIS

Mr. Netra Khatri
Building and Engineering Department
City of Arcata
525 9th Street
Arcata, CA 95521

Dear Mr. Khatri,

Thank you for the opportunity to comment on the conclusions and recommended mitigation measures for the Central Arcata Area-wide Traffic Impact Study (TIS), which was finalized in December of 2016. We have been in discussion with the City and have met with Humboldt State University (HSU) to resolve the near-term mitigation for growth impacts at Sunset Avenue and LK Wood Boulevard and the US 101 northbound off-ramps. After analyzing multiple scenarios from the TIS using VISSIM traffic modeling software, we have the following comments:

Traffic Safety

CT2 #1

- Caltrans has identified two collisions between vehicles and pedestrians with data from the most recent three-year period available. These collisions took place at the northbound US 101 off-ramp at Sunset Ave. No collisions were reported at the intersection of Sunset Ave with LK Wood Blvd. Based on the limited number of collisions reported, this location would not be eligible to receive funding for improvements under the Caltrans traffic safety program.

CT2 #2

- Based on the type of collisions reported, Caltrans could not justify funding the proposed pedestrian refuge islands under the Caltrans Traffic Safety programs for a lack of clear nexus. If the types of collisions that were observed happened consistently enough to demonstrate a deficiency in the existing condition, our first course of action would be to increase the visibility of the crosswalk through a change in the pavement markings. Installing high visibility crossings has been shown to reduce these types of collisions by 40%.

Traffic Operations

CT2 #3

- The TIS proposes near-term improvements at LK Wood Blvd. and Sunset Ave. to address a low Level of Service (LOS) for northbound LK Wood Blvd. The TIS stated that a left-turn pocket on northbound LK Wood at Sunset Ave. would improve the LOS, however, LK Wood Blvd. is on Humboldt State University property and does not have an established

Level of Service for maintaining traffic operation or flow. Humboldt State University has stated that their preference is to prioritize non-motorized modes of travel at this location and has proposed installing pedestrian refuge islands as a physical barrier to limit pedestrian exposure across the existing striped crossing.

CT2 #4

- The northbound U.S. Route 101 off-ramp is projected to operate at LOS F in the future with the six proposed developments. The TIS has proposed a roundabout to mitigate for future vehicle, pedestrian and bicycle volumes with future growth associated with the proposed central Arcata developments. We have previously stated that an Intersection Control Evaluation (ICE) will need to be conducted to confirm the appropriate intersection control measure, however, we anticipate that any short term improvement at this intersection will need to be removed in order to accommodate future increases in all modes of travel at the intersection.

Short-term Mitigation Measures

CT2 #5

- Both the TIS and HSU recommend pedestrian refuge islands with concrete curbs to separate pedestrians and vehicles. The TIS proposes modifications to the design of the intersection, including the removal of a free-right turn for eastbound Sunset Ave at LK Wood, which would be replaced by a bicycle only free-right turn. The proposed short term mitigation improvements are not anticipated to improve bicyclist safety or benefit traffic operations for which reasons Caltrans does not support the TIS' proposed intersection modifications.

CT2 #6

- As an alternative to constructing raised islands for pedestrian refuge, Caltrans will offer to some install high visibility crosswalks and reflective delineators at the existing striped islands. This can be done at State expense and provide a safety benefit for bicyclists and pedestrians in the short term without the added expense to install or remove with the ultimate intersection improvement. The reflective delineators both provide a "soft" barrier between vehicles and non-motorized travelers and increase the visibility of the existing islands.

Future (long-term) Mitigation Measures

CT2 #7

- Conceptually, Caltrans is in agreement with the need for long term improvements at Sunset Avenue and the US 101 northbound ramps. Additional study will be needed to determine the ultimate intersection design and final estimates of the improvement costs. Any shortfalls in mitigation impact fees collected will need to be provided through public sources, including local funds from the City of Arcata and/or the Humboldt County Association of Governments, Humboldt State University and Caltrans. We recommend that the City continue to refine the cost estimates through the initiation of detailed project studies.

CT2 #8

- Please include Caltrans with further planning and development of the long-term mitigation measure at Sunset Ave and the northbound US Route 101 ramps. Caltrans has yet to approve some of the assumptions stated in the TIS. These details can be addressed in a collaborative design process.

Feel free to contact me with questions or for further assistance with this review, at (707) 441-4693 or <jesse.robertson@dot.ca.gov>.

Sincerely,

Jesse Robertson
Associate Transportation Planner
Caltrans District 1 Transportation Planning

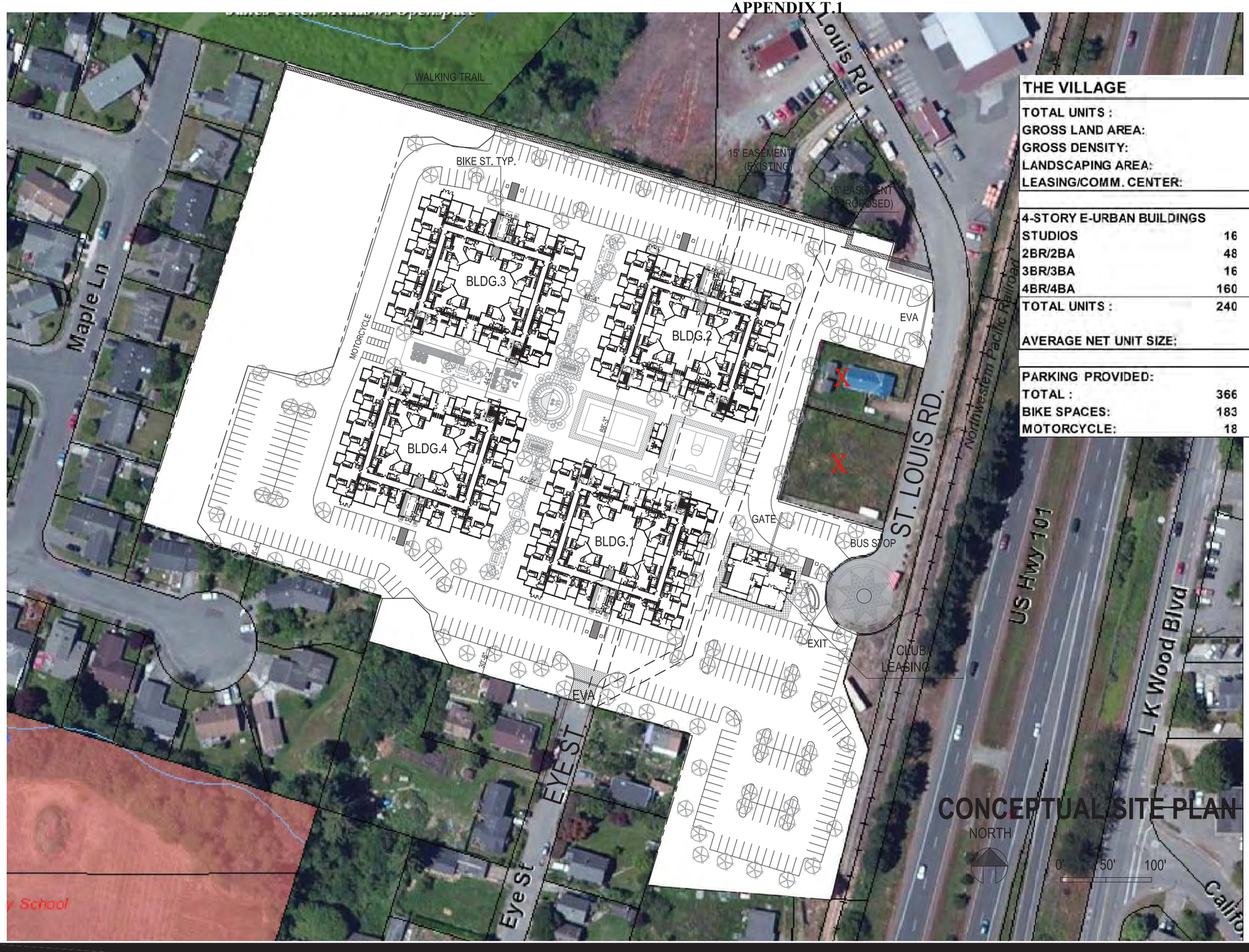
cc: Alyson Hunter, City of Arcata Community Development Department
Marcella Clem, Humboldt County Association of Governments
Traci Ferdolage, Humboldt State University

APPENDIX T.1

Appendix B

Preliminary Site Plans – Creekside Homes and The Village

APPENDIX T.1



THE VILLAGE			
TOTAL UNITS :	240	800	BEDS
GROSS LAND AREA:	10.2		
GROSS DENSITY:	24		
LANDSCAPING AREA:	2.07	ACRES	20% OF TOTAL SITE AREA
LEASING/COMM. CENTER:	7,500		

4-STORY E-URBAN BUILDINGS		
STUDIOS	16	7%
2BR/2BA	48	20%
3BR/3BA	16	7%
4BR/4BA	160	67%
TOTAL UNITS :	240	100%
AVERAGE NET UNIT SIZE:	1,245	S.F.

PARKING PROVIDED:			
TOTAL :	366	0.46	PER BED
BIKE SPACES:	183		50% OF PARKING
MOTORCYCLE:	18		1 PER 20 PARKING SPACES

CONCEPTUAL SITE PLAN

NORTH

0' 50' 100'

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Architectural conceptual site plans are for feasibility purpose only. Revisions may occur due to further investigation from regulatory authorities and building code analysis. Dimensions shown are of a strategic intent only. Refer to surveys and civil drawings for technical information and measurements.

THE VILLAGE

Sep 30, 2015 ARCATA, CA HPA#15248

HUMPHREYS & PARTNERS ARCHITECTS L.P.
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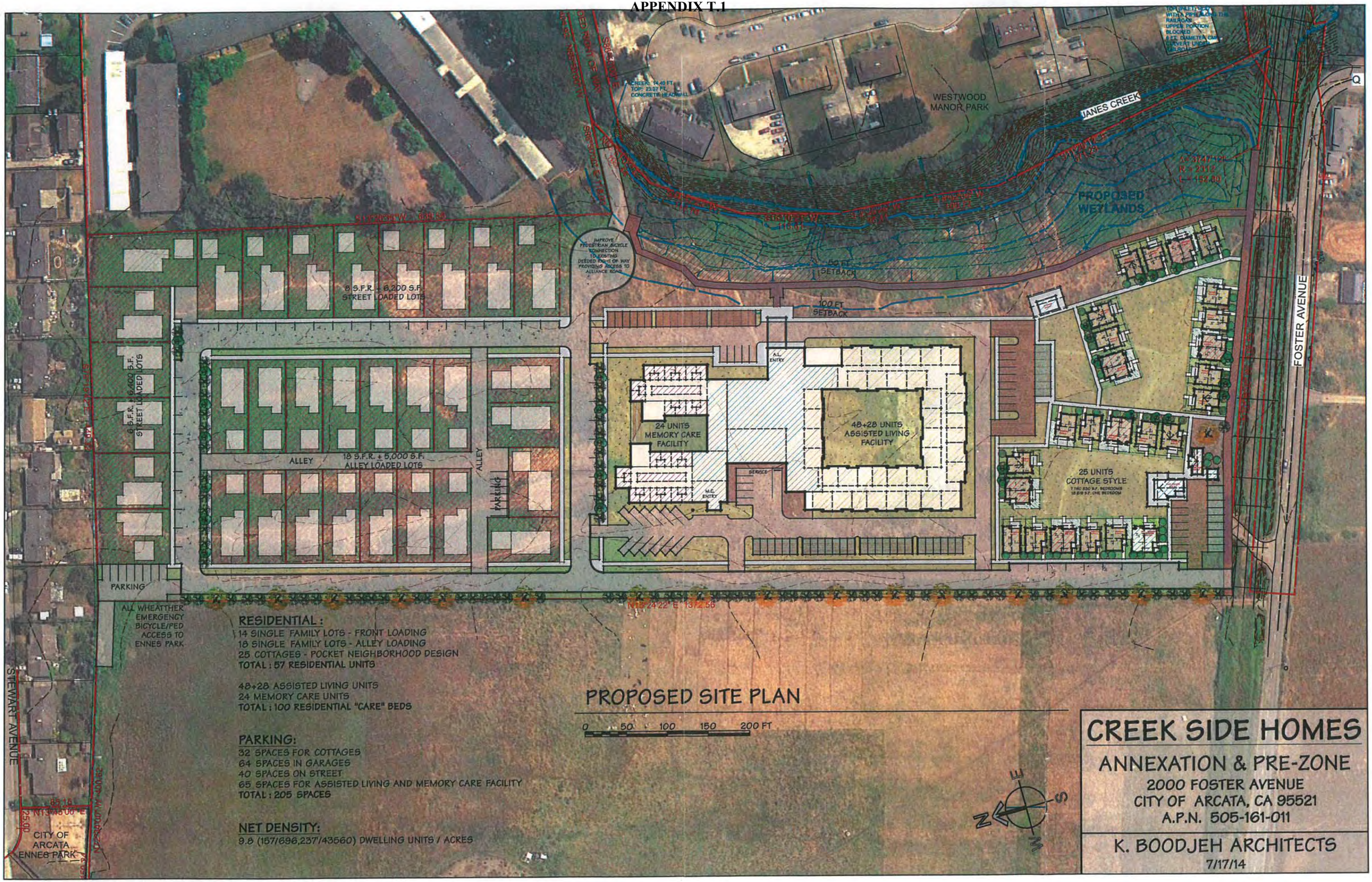

RESIDENTIAL :
14 SINGLE FAMILY LOTS - FRONT LOADING
18 SINGLE FAMILY LOTS - ALLEY LOADING
25 COTTAGES - POCKET NEIGHBORHOOD DESIGN
TOTAL : 57 RESIDENTIAL UNITS

48+28 ASSISTED LIVING UNITS
24 MEMORY CARE UNITS
TOTAL : 100 RESIDENTIAL "CARE" BEDS

PARKING:
32 SPACES FOR COTTAGES
64 SPACES IN GARAGES
40 SPACES ON STREET
65 SPACES FOR ASSISTED LIVING AND MEMORY CARE FACILITY
TOTAL : 205 SPACES

NET DENSITY:
9.8 (157/696,237/43560) DWELLING UNITS / ACRES

PROPOSED SITE PLAN

0 50 100 150 200 FT

CREEK SIDE HOMES

ANNEXATION & PRE-ZONE

2000 FOSTER AVENUE
CITY OF ARCATA, CA 95521
A.P.N. 505-161-011

K. BOODJEH ARCHITECTS
7/17/14

Appendix C

Collision Rate Calculations

APPENDIX T.1

APPENDIX T.1

Intersection Collision Rate Calculations

Central Arcata Areawide Study

Intersection # 1: St. Louis Road & US 101 Overpass

Date of Count: Thursday, March 03, 2016

Number of Collisions: 2
Number of Injuries: 1
Number of Fatalities: 0
ADT: 3600
Start Date: January 1, 2011
End Date: December 31, 2015
Number of Years: 5

Intersection Type: Tee
Control Type: Stop & Yield Controls
Area: Urban

$$\text{collision rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x 365 Days per Year x Number of Years}}$$

$$\text{collision rate} = \frac{2 \times 1{,}000{,}000}{3{,}600 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.30 c/mve**	**0.0%**	**50.0%**
Statewide Average*	**0.18 c/mve**	**0.7%**	**36.4%**

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2012 Collision Data on California State Highways, Caltrans

Intersection # 2: LKWood Boulevard & US 101 Overpass

Date of Count: Thursday, March 03, 2016

Number of Collisions: 0
Number of Injuries: 0
Number of Fatalities: 0
ADT: 4900
Start Date: January 1, 2011
End Date: December 31, 2015
Number of Years: 5

Intersection Type: Tee
Control Type: Stop & Yield Controls
Area: Urban

$$\text{collision rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x 365 Days per Year x Number of Years}}$$

$$\text{collision rate} = \frac{0 \times 1{,}000{,}000}{4{,}900 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.00 c/mve**	**0.0%**	**0.0%**
Statewide Average*	**0.18 c/mve**	**0.7%**	**36.4%**

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2012 Collision Data on California State Highways, Caltrans

APPENDIX T.1

Intersection Collision Rate Calculaions

Central Arcata Areawide Study

Intersection # 3: Sunset Avenue & LKWood Boulevard

Date of Count: Thursday, March 03, 2016

Number of Collisions: 3
Number of Injuries: 0
Number of Fatalities: 0
ADT: 13400
Start Date: January 1, 2011
End Date: December 31, 2015
Number of Years: 5

Intersection Type: Tee
Control Type: 4 Way Stop
Area: Urban

$$\text{collision rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x 365 Days per Year x Number of Years}}$$

$$\text{collision rate} = \frac{3 \times 1{,}000{,}000}{13{,}400 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.12 c/mve**	**0.0%**	**0.0%**
Statewide Average*	**0.05 c/mve**	**1.1%**	**35.9%**

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2012 Collision Data on California State Highways, Caltrans

Intersection # 4: Sunset Avenue & US 101 NB Ramps

Date of Count: Thursday, March 03, 2016

Number of Collisions: 4 (three of four involved ped or bike)
Number of Injuries: 2
Number of Fatalities: 1 (pedestrian-involved)
ADT: 12300
Start Date: January 1, 2011
End Date: December 31, 2015
Number of Years: 5

Intersection Type: Four-Legged
Control Type: Stop & Yield Controls
Area: Urban

$$\text{collision rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x 365 Days per Year x Number of Years}}$$

$$\text{collision rate} = \frac{4 \times 1{,}000{,}000}{12{,}300 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.18 c/mve**	**25.0%**	**50.0%**
Statewide Average*	**0.15 c/mve**	**1.0%**	**41.9%**

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2012 Collision Data on California State Highways, Caltrans

APPENDIX T.1

Intersection Collision Rate Calculaions

Central Arcata Areawide Study

Intersection # 5: Sunset Avenue & US 101 SB Ramps-G Street/H Street

Date of Count: Thursday, March 03, 2016

Number of Collisions: 10
Number of Injuries: 3
Number of Fatalities: 1
ADT: 13400
Start Date: January 1, 2011
End Date: December 31, 2015
Number of Years: 5

Intersection Type: Multi-Legged
Control Type: 4 Way Stop
Area: Urban

$$\text{collision rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x 365 Days per Year x Number of Years}}$$

$$\text{collision rate} = \frac{10 \times 1{,}000{,}000}{13{,}400 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.41 c/mve**	**10.0%**	**30.0%**
Statewide Average*	**0.21 c/mve**	**0.4%**	**35.6%**

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2012 Collision Data on California State Highways, Caltrans

Intersection # 6: Sunset Avenue & Foster Avenue-Jay Street

Date of Count: Thursday, March 03, 2016

Number of Collisions: 1
Number of Injuries: 0
Number of Fatalities: 0
ADT: 6700
Start Date: January 1, 2011
End Date: December 31, 2015
Number of Years: 5

Intersection Type: Tee
Control Type: Stop & Yield Controls (recently converted to a roundabout)
Area: Urban

$$\text{collision rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x 365 Days per Year x Number of Years}}$$

$$\text{collision rate} = \frac{1 \times 1{,}000{,}000}{6{,}700 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.08 c/mve**	**0.0%**	**0.0%**
Statewide Average*	**0.18 c/mve**	**0.7%**	**36.4%**

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2012 Collision Data on California State Highways, Caltrans

APPENDIX T.1

Intersection Collision Rate Calculaions

Central Arcata Areawide Study

Intersection # 7: Foster Avenue & Alliance Road

Date of Count: Thursday, March 03, 2016

Number of Collisions: 5
Number of Injuries: 3
Number of Fatalities: 0
ADT: 11900
Start Date: January 1, 2011
End Date: December 31, 2015
Number of Years: 5

Intersection Type: Four-Legged
Control Type: 4 Way Stop
Area: Urban

$$\text{collision rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x 365 Days per Year x Number of Years}}$$

$$\text{collision rate} = \frac{5 \times 1{,}000{,}000}{11{,}900 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.23 c/mve**	**0.0%**	**60.0%**
Statewide Average*	**0.21 c/mve**	**0.4%**	**35.6%**

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2012 Collision Data on California State Highways, Caltrans

Intersection # 8: 17th Street & Q Street

Date of Count: Wednesday, April 20, 2016

Number of Collisions: 0
Number of Injuries: 0
Number of Fatalities: 0
ADT: 2000
Start Date: January 1, 2011
End Date: December 31, 2015
Number of Years: 5

Intersection Type: Tee
Control Type: No Controls
Area: Urban

$$\text{collision rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x 365 Days per Year x Number of Years}}$$

$$\text{collision rate} = \frac{0 \times 1{,}000{,}000}{2{,}000 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.00 c/mve**	**0.0%**	**0.0%**
Statewide Average*	**0.06 c/mve**	**0.6%**	**38.2%**

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2012 Collision Data on California State Highways, Caltrans

APPENDIX T.1

Intersection Collision Rate Calculaions

Central Arcata Areawide Study

Intersection # 9: 17th Street & Alliance Road

Date of Count: Wednesday, April 27, 2016

Number of Collisions: 3
Number of Injuries: 1
Number of Fatalities: 0
ADT: 8600
Start Date: January 1, 2011
End Date: December 31, 2015
Number of Years: 5

Intersection Type: Tee
Control Type: Stop & Yield Controls
Area: Urban

$$\text{collision rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x 365 Days per Year x Number of Years}}$$

$$\text{collision rate} = \frac{3 \times 1{,}000{,}000}{8{,}600 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.19 c/mve**	**0.0%**	**33.3%**
Statewide Average*	**0.18 c/mve**	**0.7%**	**36.4%**

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2012 Collision Data on California State Highways, Caltrans

Intersection # 10: 11th Street & K Street

Date of Count: Thursday, March 03, 2016

Number of Collisions: 5
Number of Injuries: 1
Number of Fatalities: 0
ADT: 11400
Start Date: January 1, 2011
End Date: December 31, 2015
Number of Years: 5

Intersection Type: Four-Legged
Control Type: 4 Way Stop
Area: Urban

$$\text{collision rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x 365 Days per Year x Number of Years}}$$

$$\text{collision rate} = \frac{5 \times 1{,}000{,}000}{11{,}400 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.24 c/mve**	**0.0%**	**20.0%**
Statewide Average*	**0.21 c/mve**	**0.4%**	**35.6%**

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2012 Collision Data on California State Highways, Caltrans

APPENDIX T.1

Intersection Collision Rate Calculaions

Central Arcata Areawide Study

Intersection # 11: 11th Street & Janes Road

Date of Count: Thursday, March 03, 2016

Number of Collisions: 4
Number of Injuries: 2
Number of Fatalities: 0
ADT: 3200
Start Date: January 1, 2011
End Date: December 31, 2015
Number of Years: 5

Intersection Type: Four-Legged
Control Type: Stop & Yield Controls
Area: Urban

$$\text{collision rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x 365 Days per Year x Number of Years}}$$

$$\text{collision rate} = \frac{4 \times 1{,}000{,}000}{3{,}200 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.68 c/mve**	**0.0%**	**50.0%**
Statewide Average*	**0.15 c/mve**	**1.0%**	**41.9%**

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2012 Collision Data on California State Highways, Caltrans

Intersection # 12: Foster Avenue & Janes Road

Date of Count: Wednesday, April 20, 2016

Number of Collisions: 0
Number of Injuries: 0
Number of Fatalities: 0
ADT: 1900
Start Date: January 1, 2011
End Date: December 31, 2015
Number of Years: 5

Intersection Type: Tee
Control Type: Stop & Yield Controls
Area: Urban

$$\text{collision rate} = \frac{\text{Number of Collisions x 1 Million}}{\text{ADT x 365 Days per Year x Number of Years}}$$

$$\text{collision rate} = \frac{0 \times 1{,}000{,}000}{1{,}900 \times 365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.00 c/mve**	**0.0%**	**0.0%**
Statewide Average*	**0.18 c/mve**	**0.7%**	**36.4%**

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2012 Collision Data on California State Highways, Caltrans

Appendix D

Intersection Level of Service Calculations

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.012

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Peak Hour Factor	0.9140	1.0000	0.9140	0.9140	1.0000	0.9140	1.0000	0.9140	0.9140	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	1	50	0	2	0	2	27	0	0	0
Total Analysis Volume [veh/h]	5	0	5	201	0	7	0	9	108	0	0	0
Pedestrian Volume [ped/h]	0			0			9			9		

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Stop		Free	
Flared Lane	Yes				No			
Storage Area [veh]	1		0		0		0	
Two-Stage Gap Acceptance	No				No			
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.10	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.23	0.00	9.41	0.00	0.00	0.00	0.00	10.37	8.83	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.38	0.38	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.55	0.00	0.55	0.00	0.00	0.00	0.00	9.60	9.60	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.82			0.00			8.95			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	3.42											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	11.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.153

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	87	27	89	19	8	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	87	27	89	19	8	181
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	7	23	5	2	47
Total Analysis Volume [veh/h]	91	28	93	20	8	189
Pedestrian Volume [ped/h]	0		0		0	

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.15	0.02	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	11.82	9.67	7.44	0.00
Movement LOS	A	A	B	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.54	0.54	0.46	0.46
95th-Percentile Queue Length [ft]	0.00	0.00	13.49	13.49	11.43	11.43
d_A, Approach Delay [s/veh]	0.00		11.44		0.30	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	3.15					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	13.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	95	95	183	225	158	392
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	95	95	183	225	158	392
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	26	51	63	44	109
Total Analysis Volume [veh/h]	106	106	203	250	176	436
Pedestrian Volume [ped/h]	75		0		0	

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.17	1.82	2.14	1.50	1.57	1.57
95th-Percentile Queue Length [ft]	54.29	45.46	53.54	37.59	39.16	39.16
Approach Delay [s/veh]	15.95	13.63		12.05		
Approach LOS	C	B		B		
Intersection Delay [s/veh]	13.26					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	44.0
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.479

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	74	0	118	0	0	0	93	430	0	0	251	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	74	0	118	0	0	0	93	430	0	0	251	67
Peak Hour Factor	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	0	33	0	0	0	26	119	0	0	70	19
Total Analysis Volume [veh/h]	82	0	131	0	0	0	103	478	0	0	279	74
Pedestrian Volume [ped/h]	75			0			0			0		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.48	0.00	0.22	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	44.00	26.08	11.90	0.00	0.00	0.00	8.26	0.00	0.00	0.00	0.00	0.00
Movement LOS	E	D	B				A	A			A	A
95th-Percentile Queue Length [veh]	2.29	0.37	0.37	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	57.22	9.36	9.36	0.00	0.00	0.00	6.99	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	24.25			0.00			1.47			0.00		
Approach LOS	C			A			A			A		
d_I, Intersection Delay [s/veh]	5.25											
Intersection LOS	E											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	14.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	35	7	11	311	391	190	128	201	46	90	123	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	7	11	311	391	190	128	201	46	90	123	112
Peak Hour Factor	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	2	3	85	107	52	35	55	13	25	34	31
Total Analysis Volume [veh/h]	38	8	12	340	427	207	140	219	50	98	134	122
Pedestrian Volume [ped/h]	60			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.31	4.60	1.75	1.75	1.43	1.20	2.11	0.29	0.78	1.08	0.85
95th-Percentile Queue Length [ft]	7.76	114.8	43.86	43.86	35.69	29.88	52.85	7.27	19.54	27.02	21.26
Approach Delay [s/veh]	9.45	15.46				13.66			12.06		
Approach LOS	A	C				B			B		
Intersection Delay [s/veh]	14.18										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset AM Existing

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	29	2.0	0.201	5.0	LOS A	1.0	24.4	0.40	0.27	23.0
8	T1	1	2.0	0.201	5.0	LOS A	1.0	24.4	0.40	0.27	23.0
18	R2	196	2.0	0.201	5.0	LOS A	1.0	24.4	0.40	0.27	22.7
Approach		226	2.0	0.201	5.0	LOS A	1.0	24.4	0.40	0.27	22.8
East: Sunset Ave											
1	L2	203	2.0	0.283	5.1	LOS A	1.6	41.1	0.15	0.05	22.8
6	T1	178	2.0	0.283	5.1	LOS A	1.6	41.1	0.15	0.05	22.9
16	R2	6	2.0	0.283	5.1	LOS A	1.6	41.1	0.15	0.05	22.6
Approach		387	2.0	0.283	5.1	LOS A	1.6	41.1	0.15	0.05	22.8
North: Jay Street											
7	L2	27	2.0	0.036	4.2	LOS A	0.1	3.7	0.47	0.34	22.9
4	T1	6	2.0	0.036	4.2	LOS A	0.1	3.7	0.47	0.34	22.9
14	R2	1	2.0	0.036	4.2	LOS A	0.1	3.7	0.47	0.34	22.6
Approach		33	2.0	0.036	4.2	LOS A	0.1	3.7	0.47	0.34	22.9
West: Sunset Ave											
5	L2	1	2.0	0.181	4.9	LOS A	0.9	21.7	0.41	0.28	23.2
2	T1	189	2.0	0.181	4.9	LOS A	0.9	21.7	0.41	0.28	23.3
12	R2	11	2.0	0.181	4.9	LOS A	0.9	21.7	0.41	0.28	23.0
Approach		201	2.0	0.181	4.9	LOS A	0.9	21.7	0.41	0.28	23.2
All Vehicles		847	2.0	0.283	5.0	LOS A	1.6	41.1	0.29	0.17	22.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	18.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	3	232	116	120	290	3	5	11	8	185	5	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	232	116	120	290	3	5	11	8	185	5	65
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	64	32	33	81	1	1	3	2	51	1	18
Total Analysis Volume [veh/h]	3	258	129	133	322	3	6	12	9	206	6	72
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.04	6.12	0.17	2.09	0.47
95th-Percentile Queue Length [ft]	100.94	152.90	4.20	52.17	11.65
Approach Delay [s/veh]	16.62	22.05	10.48	13.95	
Approach LOS	C	C	B	B	
Intersection Delay [s/veh]	17.97				
Intersection LOS	C				

APPENDIX T.1

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Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	12.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	1	83	57	3	122	80
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	83	57	3	122	80
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	23	16	1	34	22
Total Analysis Volume [veh/h]	1	92	63	3	136	89
Pedestrian Volume [ped/h]	9		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.09	0.00	0.00	0.09	0.00
d_M, Delay for Movement [s/veh]	12.33	9.07	0.00	0.00	7.62	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.32	0.32	0.00	0.00	0.52	0.52
95th-Percentile Queue Length [ft]	7.92	7.92	0.00	0.00	13.08	13.08
d_A, Approach Delay [s/veh]	9.10		0.00		4.60	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.90					
Intersection LOS	B					

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Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	21.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.375

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	21	247	321	173	121	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	247	321	173	121	20
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	69	89	48	34	6
Total Analysis Volume [veh/h]	23	274	357	192	134	22
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.37	0.04
d_M, Delay for Movement [s/veh]	8.61	0.00	0.00	0.00	20.98	11.16
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	1.22	1.22	0.00	0.00	1.70	0.11
95th-Percentile Queue Length [ft]	30.38	30.38	0.00	0.00	42.40	2.82
d_A, Approach Delay [s/veh]	0.67		0.00		19.60	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	3.25					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	14.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	K St			K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	K St			K St			11th St			11th St		
Base Volume Input [veh/h]	109	143	16	37	182	6	38	153	112	32	73	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	109	143	16	37	182	6	38	153	112	32	73	27
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	40	4	10	51	2	11	43	31	9	20	8
Total Analysis Volume [veh/h]	121	159	18	41	202	7	42	170	124	36	81	30
Pedestrian Volume [ped/h]	9			9			6			6		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.73	2.06	3.16	1.01
95th-Percentile Queue Length [ft]	68.13	51.52	79.09	25.19
Approach Delay [s/veh]	14.61	13.29	15.08	11.37
Approach LOS	B	B	C	B
Intersection Delay [s/veh]	13.98			
Intersection LOS	B			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	12.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.008

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	16	15	18	17	1	1	6	2	14	5	13
Total Analysis Volume [veh/h]	2	62	60	70	68	2	4	26	7	58	20	50
Pedestrian Volume [ped/h]	5			5			4			4		

Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.05	0.00	0.00	0.01	0.05	0.01	0.10	0.04	0.05
d_M, Delay for Movement [s/veh]	7.37	0.00	0.00	7.60	0.00	0.00	12.08	11.91	9.01	11.96	11.97	9.42
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.27	0.27	0.27	0.32	0.32	0.32	0.17	0.17	0.17	0.48	0.48	0.48
95th-Percentile Queue Length [ft]	6.65	6.65	6.65	7.97	7.97	7.97	4.37	4.37	4.37	11.90	11.90	11.90
d_A, Approach Delay [s/veh]	0.12			3.80			11.38			10.97		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	5.53											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	4	53	5	3	75	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	53	5	3	75	5
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	15	1	1	21	1
Total Analysis Volume [veh/h]	4	59	6	3	83	6
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.05	0.00	0.00	0.05	0.00
d_M, Delay for Movement [s/veh]	9.91	8.57	0.00	0.00	7.36	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.19	0.19	0.00	0.00	0.18	0.18
95th-Percentile Queue Length [ft]	4.79	4.79	0.00	0.00	4.38	4.38
d_A, Approach Delay [s/veh]	8.65		0.00		6.86	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.18					
Intersection LOS	A					

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Intersection Level Of Service Report

Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Peak Hour Factor	0.9340	1.0000	0.9340	0.9340	1.0000	0.9340	1.0000	0.9340	0.9340	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	0	6	37	0	3	0	2	42	0	0	0
Total Analysis Volume [veh/h]	24	0	22	148	0	11	0	9	167	0	0	0
Pedestrian Volume [ped/h]	0			0			11			11		

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Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.16	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.97	0.00	9.22	0.00	0.00	0.00	0.00	10.30	9.10	0.00	0.00	0.00
Movement LOS	A		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.10	0.00	0.10	0.00	0.00	0.00	0.00	0.61	0.61	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	2.52	0.00	2.52	0.00	0.00	0.00	0.00	15.19	15.19	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.61			0.00			9.16			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	5.39											
Intersection LOS	B											

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Intersection Level Of Service Report

Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	12.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.129

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	160	93	68	25	18	129
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	160	93	68	25	18	129
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	24	18	7	5	34
Total Analysis Volume [veh/h]	168	97	71	26	19	135
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.13	0.03	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	12.26	10.08	7.70	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.44	0.44	0.38	0.38
95th-Percentile Queue Length [ft]	0.00	0.00	11.06	11.06	9.61	9.61
d_A, Approach Delay [s/veh]	0.00		11.68		0.95	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	2.48					
Intersection LOS	B					

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Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	36.3
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	280	155	170	243	307	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	280	155	170	243	307	181
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	75	42	46	65	83	49
Total Analysis Volume [veh/h]	301	167	183	261	330	195
Pedestrian Volume [ped/h]	147		0		0	

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	13.33	1.95	3.05	5.80	0.66	0.66
95th-Percentile Queue Length [ft]	333.22	48.68	76.16	144.95	16.42	16.42
Approach Delay [s/veh]	70.34	17.15		22.22		
Approach LOS	F	C		C		
Intersection Delay [s/veh]	36.33					
Intersection LOS	E					

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Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	66.9
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.688

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	103	4	254	0	0	0	114	236	0	0	282	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	103	4	254	0	0	0	114	236	0	0	282	241
Peak Hour Factor	0.9490	0.9490	0.9490	1.0000	1.0000	1.0000	0.9490	0.9490	1.0000	1.0000	0.9490	0.9490
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	1	67	0	0	0	30	62	0	0	74	63
Total Analysis Volume [veh/h]	109	4	268	0	0	0	120	249	0	0	297	254
Pedestrian Volume [ped/h]	146			0			0			0		

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Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.69	0.03	0.34	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	66.91	31.37	10.65	0.00	0.00	0.00	9.00	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	D	B				A	A			A	A
95th-Percentile Queue Length [veh]	4.01	0.72	0.67	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	100.29	17.99	16.74	0.00	0.00	0.00	9.98	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	26.96			0.00			2.93			0.00		
Approach LOS	D			A			A			A		
d_I, Intersection Delay [s/veh]	8.73											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	11.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	75	30	26	149	279	101	67	175	60	111	152	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	75	30	26	149	279	101	67	175	60	111	152	116
Peak Hour Factor	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	8	7	39	73	26	17	46	16	29	40	30
Total Analysis Volume [veh/h]	78	31	27	155	290	105	70	182	62	116	158	121
Pedestrian Volume [ped/h]	112			0			0			0		

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.88	1.22	1.01	1.01	0.59	0.48	1.48	0.35	0.88	1.22	0.75
95th-Percentile Queue Length [ft]	21.97	30.41	25.26	25.26	14.74	11.99	36.99	8.64	22.11	30.41	18.83
Approach Delay [s/veh]	10.86	11.20				11.70			11.53		
Approach LOS	B	B				B			B		
Intersection Delay [s/veh]	11.37										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset PM Existing

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	8	2.0	0.158	4.3	LOS A	0.7	18.9	0.30	0.16	23.2
8	T1	9	2.0	0.158	4.3	LOS A	0.7	18.9	0.30	0.16	23.2
18	R2	175	2.0	0.158	4.3	LOS A	0.7	18.9	0.30	0.16	23.0
Approach		193	2.0	0.158	4.3	LOS A	0.7	18.9	0.30	0.16	23.0
East: Sunset Ave											
1	L2	192	2.0	0.247	4.7	LOS A	1.4	34.5	0.11	0.03	22.9
6	T1	116	2.0	0.247	4.7	LOS A	1.4	34.5	0.11	0.03	22.9
16	R2	34	2.0	0.247	4.7	LOS A	1.4	34.5	0.11	0.03	22.7
Approach		342	2.0	0.247	4.7	LOS A	1.4	34.5	0.11	0.03	22.9
North: Jay Street											
7	L2	34	2.0	0.045	3.9	LOS A	0.2	4.8	0.42	0.28	23.0
4	T1	10	2.0	0.045	3.9	LOS A	0.2	4.8	0.42	0.28	23.0
14	R2	2	2.0	0.045	3.9	LOS A	0.2	4.8	0.42	0.28	22.7
Approach		46	2.0	0.045	3.9	LOS A	0.2	4.8	0.42	0.28	23.0
West: Sunset Ave											
5	L2	1	2.0	0.100	4.1	LOS A	0.4	11.2	0.38	0.25	23.4
2	T1	99	2.0	0.100	4.1	LOS A	0.4	11.2	0.38	0.25	23.4
12	R2	11	2.0	0.100	4.1	LOS A	0.4	11.2	0.38	0.25	23.2
Approach		111	2.0	0.100	4.1	LOS A	0.4	11.2	0.38	0.25	23.4
All Vehicles		692	2.0	0.247	4.4	LOS A	1.4	34.5	0.23	0.12	23.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	23.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	13	354	113	100	322	6	5	16	12	109	20	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	354	113	100	322	6	5	16	12	109	20	124
Peak Hour Factor	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	96	31	27	88	2	1	4	3	30	5	34
Total Analysis Volume [veh/h]	14	386	123	109	351	7	5	17	13	119	22	135
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	8.59	7.00	0.24	1.03	1.21
95th-Percentile Queue Length [ft]	214.79	175.08	5.89	25.64	30.27
Approach Delay [s/veh]	29.31	25.42	11.11	12.64	
Approach LOS	D	D	B	B	
Intersection Delay [s/veh]	23.89				
Intersection LOS	C				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	10.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	3	37	41	3	56	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	37	41	3	56	36
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	10	11	1	16	10
Total Analysis Volume [veh/h]	3	41	46	3	62	40
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.04	0.00	0.00	0.04	0.00
d_M, Delay for Movement [s/veh]	10.00	8.69	0.00	0.00	7.41	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.14	0.14	0.00	0.00	0.21	0.21
95th-Percentile Queue Length [ft]	3.46	3.46	0.00	0.00	5.25	5.25
d_A, Approach Delay [s/veh]	8.78		0.00		4.50	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.34					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	17.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.193

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	18	340	315	69	68	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	340	315	69	68	11
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	89	82	18	18	3
Total Analysis Volume [veh/h]	19	354	328	72	71	11
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.19	0.02
d_M, Delay for Movement [s/veh]	8.16	0.00	0.00	0.00	17.10	10.37
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	1.40	1.40	0.00	0.00	0.70	0.05
95th-Percentile Queue Length [ft]	35.11	35.11	0.00	0.00	17.59	1.23
d_A, Approach Delay [s/veh]	0.42		0.00		16.20	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	1.73					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	20.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name				K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name				K St			11th St			11th St		
Base Volume Input [veh/h]	96	283	37	54	233	7	21	104	84	52	121	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	96	283	37	54	233	7	21	104	84	52	121	46
Peak Hour Factor	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	75	10	14	62	2	6	28	22	14	32	12
Total Analysis Volume [veh/h]	102	301	39	58	248	7	22	111	89	55	129	49
Pedestrian Volume [ped/h]	17			18			5			12		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	6.97	3.54	2.05	2.27
95th-Percentile Queue Length [ft]	174.23	88.54	51.36	56.82
Approach Delay [s/veh]	26.82	17.85	14.61	15.32
Approach LOS	D	C	B	C
Intersection Delay [s/veh]	20.04			
Intersection LOS	C			

APPENDIX T.1

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Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	14	14	8	7	0	0	7	2	13	8	16
Total Analysis Volume [veh/h]	4	54	54	32	27	1	1	28	8	52	32	64
Pedestrian Volume [ped/h]	4			3			3			7		

Generated with PTV VISTRO

Version 4.00-02

Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.04	0.01	0.07	0.05	0.07
d_M, Delay for Movement [s/veh]	7.29	0.00	0.00	7.51	0.00	0.00	10.90	10.68	8.69	10.58	10.70	9.17
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.23	0.23	0.23	0.13	0.13	0.13	0.14	0.14	0.14	0.41	0.41	0.41
95th-Percentile Queue Length [ft]	5.73	5.73	5.73	3.20	3.20	3.20	3.46	3.46	3.46	10.36	10.36	10.36
d_A, Approach Delay [s/veh]	0.26			4.01			10.25			10.00		
Approach LOS	A			A			B			A		
d_I, Intersection Delay [s/veh]	5.96											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.013

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	11	26	9	3	28	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	26	9	3	28	10
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	7	3	1	8	3
Total Analysis Volume [veh/h]	12	29	10	3	31	11
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.03	0.00	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	9.15	8.52	0.00	0.00	7.29	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.13	0.13	0.00	0.00	0.08	0.08
95th-Percentile Queue Length [ft]	3.16	3.16	0.00	0.00	2.01	2.01
d_A, Approach Delay [s/veh]	8.70		0.00		5.38	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.07					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.032

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	15	0	83	0	0	4	0	20	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	0	88	184	0	10	0	28	99	0	0	0
Peak Hour Factor	0.9140	1.0000	0.9140	0.9140	1.0000	0.9140	1.0000	0.9140	0.9140	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	0	24	50	0	3	0	8	27	0	0	0
Total Analysis Volume [veh/h]	22	0	96	201	0	11	0	31	108	0	0	0
Pedestrian Volume [ped/h]	0			0			9			9		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.12	0.00	0.00	0.00	0.00	0.04	0.10	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.70	0.00	9.88	0.00	0.00	0.00	0.00	10.58	9.01	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.40	0.00	0.40	0.00	0.00	0.00	0.00	0.50	0.50	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	9.95	0.00	9.95	0.00	0.00	0.00	0.00	12.57	12.57	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.03			0.00			9.36			0.00		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	5.30											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	13.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.176

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	87	27	89	19	8	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	20	0	0	0	0	83
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	107	27	89	19	8	264
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	7	23	5	2	69
Total Analysis Volume [veh/h]	111	28	93	20	8	275
Pedestrian Volume [ped/h]	0		0		0	

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.18	0.02	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	13.00	10.08	7.48	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.63	0.63	0.72	0.72
95th-Percentile Queue Length [ft]	0.00	0.00	15.86	15.86	17.92	17.92
d_A, Approach Delay [s/veh]	0.00		12.49		0.21	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	2.75					
Intersection LOS	B					

APPENDIX T.1

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Version 4.00-02

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	15.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	95	95	183	225	158	392
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	18	73	10	2	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	95	113	256	235	160	392
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	31	71	65	44	109
Total Analysis Volume [veh/h]	106	126	284	261	178	436
Pedestrian Volume [ped/h]	75		0		0	

Generated with PTV VISTRO

Version 4.00-02

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.71	3.38	2.42	1.63	1.70	1.70
95th-Percentile Queue Length [ft]	67.78	84.43	60.40	40.81	42.41	42.41
Approach Delay [s/veh]	18.08	16.44		12.85		
Approach LOS	C	C		B		
Intersection Delay [s/veh]	15.13					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	45.3
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.488

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	74	0	118	0	0	0	93	430	0	0	251	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	2	0	0	0	0	0	0	0	10	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	74	0	120	0	0	0	93	430	0	0	261	67
Peak Hour Factor	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	0	33	0	0	0	26	119	0	0	73	19
Total Analysis Volume [veh/h]	82	0	133	0	0	0	103	478	0	0	290	74
Pedestrian Volume [ped/h]	75			0			0			0		

Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.49	0.00	0.23	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	45.26	26.41	11.91	0.00	0.00	0.00	8.30	0.00	0.00	0.00	0.00	0.00
Movement LOS	E	D	B				A	A			A	A
95th-Percentile Queue Length [veh]	2.35	0.38	0.38	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	58.64	9.52	9.52	0.00	0.00	0.00	7.06	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	24.63			0.00			1.47			0.00		
Approach LOS	C			A			A			A		
d_I, Intersection Delay [s/veh]	5.30											
Intersection LOS	E											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	14.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	35	7	11	311	391	190	128	201	46	90	123	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	10
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	7	11	311	391	190	128	201	46	90	123	122
Peak Hour Factor	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	2	3	85	107	52	35	55	13	25	34	33
Total Analysis Volume [veh/h]	38	8	12	340	427	207	140	219	50	98	134	133
Pedestrian Volume [ped/h]	60			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.31	4.62	1.76	1.76	1.43	1.20	2.12	0.29	0.78	1.08	0.95
95th-Percentile Queue Length [ft]	7.71	115.4	44.03	44.03	35.84	29.91	52.94	7.28	19.55	27.03	23.76
Approach Delay [s/veh]	9.41	15.52				13.67			12.12		
Approach LOS	A	C				B			B		
Intersection Delay [s/veh]	14.22										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6 Foster-Jay/Sunset AM Existing + The Village

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	29	2.0	0.201	5.0	LOS A	1.0	24.4	0.40	0.27	23.0
8	T1	1	2.0	0.201	5.0	LOS A	1.0	24.4	0.40	0.27	23.0
18	R2	196	2.0	0.201	5.0	LOS A	1.0	24.4	0.40	0.27	22.7
Approach		226	2.0	0.201	5.0	LOS A	1.0	24.4	0.40	0.27	22.8
East: Sunset Ave											
1	L2	203	2.0	0.283	5.1	LOS A	1.6	41.1	0.15	0.05	22.8
6	T1	178	2.0	0.283	5.1	LOS A	1.6	41.1	0.15	0.05	22.9
16	R2	6	2.0	0.283	5.1	LOS A	1.6	41.1	0.15	0.05	22.6
Approach		387	2.0	0.283	5.1	LOS A	1.6	41.1	0.15	0.05	22.8
North: Jay Street											
7	L2	27	2.0	0.036	4.2	LOS A	0.1	3.7	0.47	0.34	22.9
4	T1	6	2.0	0.036	4.2	LOS A	0.1	3.7	0.47	0.34	22.9
14	R2	1	2.0	0.036	4.2	LOS A	0.1	3.7	0.47	0.34	22.6
Approach		33	2.0	0.036	4.2	LOS A	0.1	3.7	0.47	0.34	22.9
West: Sunset Ave											
5	L2	1	2.0	0.181	4.9	LOS A	0.9	21.7	0.41	0.28	23.2
2	T1	189	2.0	0.181	4.9	LOS A	0.9	21.7	0.41	0.28	23.3
12	R2	11	2.0	0.181	4.9	LOS A	0.9	21.7	0.41	0.28	23.0
Approach		201	2.0	0.181	4.9	LOS A	0.9	21.7	0.41	0.28	23.2
All Vehicles		847	2.0	0.283	5.0	LOS A	1.6	41.1	0.29	0.17	22.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	19.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	3	232	116	120	290	3	5	11	8	185	5	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	4	0	0	15	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	236	116	120	305	3	5	11	8	185	5	65
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	66	32	33	85	1	1	3	2	51	1	18
Total Analysis Volume [veh/h]	3	262	129	133	339	3	6	12	9	206	6	72
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.19	6.77	0.17	2.12	0.47
95th-Percentile Queue Length [ft]	104.85	169.14	4.25	52.88	11.78
Approach Delay [s/veh]	17.09	23.93	10.59	14.11	
Approach LOS	C	C	B	B	
Intersection Delay [s/veh]	18.97				
Intersection LOS	C				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	12.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	1	83	57	3	122	80
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	83	57	3	122	80
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	23	16	1	34	22
Total Analysis Volume [veh/h]	1	92	63	3	136	89
Pedestrian Volume [ped/h]	9		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.09	0.00	0.00	0.09	0.00
d_M, Delay for Movement [s/veh]	12.33	9.07	0.00	0.00	7.62	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.32	0.32	0.00	0.00	0.52	0.52
95th-Percentile Queue Length [ft]	7.92	7.92	0.00	0.00	13.08	13.08
d_A, Approach Delay [s/veh]	9.10		0.00		4.60	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.90					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	21.7
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.386

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	21	247	321	173	121	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	4	15	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	251	336	173	121	20
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	70	93	48	34	6
Total Analysis Volume [veh/h]	23	279	373	192	134	22
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.39	0.04
d_M, Delay for Movement [s/veh]	8.66	0.00	0.00	0.00	21.73	11.29
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	1.27	1.27	0.00	0.00	1.77	0.12
95th-Percentile Queue Length [ft]	31.68	31.68	0.00	0.00	44.19	2.88
d_A, Approach Delay [s/veh]	0.66		0.00		20.26	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	3.28					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	14.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	K St			K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	K St			K St			11th St			11th St		
Base Volume Input [veh/h]	109	143	16	37	182	6	38	153	112	32	73	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	4	0	0	15	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	109	147	16	37	197	6	38	153	112	32	73	27
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	41	4	10	55	2	11	43	31	9	20	8
Total Analysis Volume [veh/h]	121	163	18	41	219	7	42	170	124	36	81	30
Pedestrian Volume [ped/h]	9			9			6			6		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.84	2.32	3.25	1.03
95th-Percentile Queue Length [ft]	71.09	58.01	81.25	25.72
Approach Delay [s/veh]	15.01	13.93	15.45	11.55
Approach LOS	C	B	C	B
Intersection Delay [s/veh]	14.39			
Intersection LOS	B			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	12.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.008

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	16	15	18	17	1	1	6	2	14	5	13
Total Analysis Volume [veh/h]	2	62	60	70	68	2	4	26	7	58	20	50
Pedestrian Volume [ped/h]	5			5			4			4		

Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.05	0.00	0.00	0.01	0.05	0.01	0.10	0.04	0.05
d_M, Delay for Movement [s/veh]	7.37	0.00	0.00	7.60	0.00	0.00	12.08	11.91	9.01	11.96	11.97	9.42
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.27	0.27	0.27	0.32	0.32	0.32	0.17	0.17	0.17	0.48	0.48	0.48
95th-Percentile Queue Length [ft]	6.65	6.65	6.65	7.97	7.97	7.97	4.37	4.37	4.37	11.90	11.90	11.90
d_A, Approach Delay [s/veh]	0.12			3.80			11.38			10.97		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	5.53											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	4	53	5	3	75	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	53	5	3	75	5
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	15	1	1	21	1
Total Analysis Volume [veh/h]	4	59	6	3	83	6
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.05	0.00	0.00	0.05	0.00
d_M, Delay for Movement [s/veh]	9.91	8.57	0.00	0.00	7.36	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.19	0.19	0.00	0.00	0.18	0.18
95th-Percentile Queue Length [ft]	4.79	4.79	0.00	0.00	4.38	4.38
d_A, Approach Delay [s/veh]	8.65		0.00		6.86	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.18					
Intersection LOS	A					

APPENDIX T.1

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Version 4.00-02

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	11.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.129

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	0	44	0	0	15	0	84	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	0	65	138	0	25	0	92	156	0	0	0
Peak Hour Factor	0.9340	1.0000	0.9340	0.9340	1.0000	0.9340	1.0000	0.9340	0.9340	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	0	17	37	0	7	0	25	42	0	0	0
Total Analysis Volume [veh/h]	32	0	70	148	0	27	0	99	167	0	0	0
Pedestrian Volume [ped/h]	0			0			11			11		

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Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.08	0.00	0.00	0.00	0.00	0.13	0.16	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.19	0.00	9.43	0.00	0.00	0.00	0.00	11.26	9.96	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.26	0.00	0.26	0.00	0.00	0.00	0.00	1.19	1.19	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	6.62	0.00	6.62	0.00	0.00	0.00	0.00	29.77	29.77	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.67			0.00			10.44			0.00		
Approach LOS	A			A			B			A		
d_I, Intersection Delay [s/veh]	6.93											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	13.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.154

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	160	93	68	25	18	129
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	84	0	0	0	0	44
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	244	93	68	25	18	173
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	64	24	18	7	5	45
Total Analysis Volume [veh/h]	255	97	71	26	19	181
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.15	0.04	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	13.84	10.93	7.91	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.54	0.54	0.57	0.57
95th-Percentile Queue Length [ft]	0.00	0.00	13.53	13.53	14.13	14.13
d_A, Approach Delay [s/veh]	0.00		13.06		0.75	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	2.18					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	58.9
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	280	155	170	243	307	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	74	39	5	10	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	280	229	209	248	317	181
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	75	62	56	67	85	49
Total Analysis Volume [veh/h]	301	246	225	267	341	195
Pedestrian Volume [ped/h]	147		0		0	

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	20.76	2.66	3.08	6.15	0.65	0.65
95th-Percentile Queue Length [ft]	518.93	66.40	77.05	153.70	16.32	16.32
Approach Delay [s/veh]	130.83	17.81		23.09		
Approach LOS	F	C		C		
Intersection Delay [s/veh]	58.86					
Intersection LOS	F					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	68.1
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.694

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	103	4	254	0	0	0	114	236	0	0	282	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	10	0	0	0	0	0	0	0	5	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	103	4	264	0	0	0	114	236	0	0	287	241
Peak Hour Factor	0.9490	0.9490	0.9490	1.0000	1.0000	1.0000	0.9490	0.9490	1.0000	1.0000	0.9490	0.9490
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	1	70	0	0	0	30	62	0	0	76	63
Total Analysis Volume [veh/h]	109	4	278	0	0	0	120	249	0	0	302	254
Pedestrian Volume [ped/h]	146			0			0			0		

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Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No			
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.69	0.03	0.35	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	68.10	31.61	10.70	0.00	0.00	0.00	9.02	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	D	B				A	A			A	A
95th-Percentile Queue Length [veh]	4.06	0.75	0.70	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	101.46	18.74	17.46	0.00	0.00	0.00	10.03	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	26.92			0.00			2.93			0.00		
Approach LOS	D			A			A			A		
d_I, Intersection Delay [s/veh]	8.82											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	11.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	75	30	26	149	279	101	67	175	60	111	152	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	75	30	26	149	279	101	67	175	60	111	152	121
Peak Hour Factor	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	8	7	39	73	26	17	46	16	29	40	31
Total Analysis Volume [veh/h]	78	31	27	155	290	105	70	182	62	116	158	126
Pedestrian Volume [ped/h]	112			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.88	1.22	1.01	1.01	0.59	0.48	1.48	0.35	0.88	1.22	0.79
95th-Percentile Queue Length [ft]	21.94	30.45	25.30	25.30	14.76	11.99	37.01	8.65	22.11	30.42	19.80
Approach Delay [s/veh]	10.85	11.21				11.70			11.54		
Approach LOS	B	B				B			B		
Intersection Delay [s/veh]	11.38										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset PM Existing + The Village

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	8	2.0	0.158	4.3	LOS A	0.7	18.9	0.30	0.16	23.2
8	T1	9	2.0	0.158	4.3	LOS A	0.7	18.9	0.30	0.16	23.2
18	R2	175	2.0	0.158	4.3	LOS A	0.7	18.9	0.30	0.16	23.0
Approach		193	2.0	0.158	4.3	LOS A	0.7	18.9	0.30	0.16	23.0
East: Sunset Ave											
1	L2	192	2.0	0.247	4.7	LOS A	1.4	34.5	0.11	0.03	22.9
6	T1	116	2.0	0.247	4.7	LOS A	1.4	34.5	0.11	0.03	22.9
16	R2	34	2.0	0.247	4.7	LOS A	1.4	34.5	0.11	0.03	22.7
Approach		342	2.0	0.247	4.7	LOS A	1.4	34.5	0.11	0.03	22.9
North: Jay Street											
7	L2	34	2.0	0.045	3.9	LOS A	0.2	4.8	0.42	0.28	23.0
4	T1	10	2.0	0.045	3.9	LOS A	0.2	4.8	0.42	0.28	23.0
14	R2	2	2.0	0.045	3.9	LOS A	0.2	4.8	0.42	0.28	22.7
Approach		46	2.0	0.045	3.9	LOS A	0.2	4.8	0.42	0.28	23.0
West: Sunset Ave											
5	L2	1	2.0	0.100	4.1	LOS A	0.4	11.2	0.38	0.25	23.4
2	T1	99	2.0	0.100	4.1	LOS A	0.4	11.2	0.38	0.25	23.4
12	R2	11	2.0	0.100	4.1	LOS A	0.4	11.2	0.38	0.25	23.2
Approach		111	2.0	0.100	4.1	LOS A	0.4	11.2	0.38	0.25	23.4
All Vehicles		692	2.0	0.247	4.4	LOS A	1.4	34.5	0.23	0.12	23.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	26.0
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	13	354	113	100	322	6	5	16	12	109	20	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	0	0	8	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	369	113	100	330	6	5	16	12	109	20	124
Peak Hour Factor	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	100	31	27	90	2	1	4	3	30	5	34
Total Analysis Volume [veh/h]	14	402	123	109	359	7	5	17	13	119	22	135
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	9.51	7.46	0.24	1.04	1.23
95th-Percentile Queue Length [ft]	237.86	186.46	5.98	25.95	30.72
Approach Delay [s/veh]	32.71	27.04	11.23	12.78	
Approach LOS	D	D	B	B	
Intersection Delay [s/veh]	25.96				
Intersection LOS	D				

APPENDIX T.1

Generated with PTV VISTRO

Version 4.00-02

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	10.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	3	37	41	3	56	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	37	41	3	56	36
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	10	11	1	16	10
Total Analysis Volume [veh/h]	3	41	46	3	62	40
Pedestrian Volume [ped/h]	0		0		0	

Generated with PTV VISTRO

Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.04	0.00	0.00	0.04	0.00
d_M, Delay for Movement [s/veh]	10.00	8.69	0.00	0.00	7.41	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.14	0.14	0.00	0.00	0.21	0.21
95th-Percentile Queue Length [ft]	3.46	3.46	0.00	0.00	5.25	5.25
d_A, Approach Delay [s/veh]	8.78		0.00		4.50	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.34					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	17.6
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.199

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	18	340	315	69	68	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	8	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	355	323	69	68	11
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	92	84	18	18	3
Total Analysis Volume [veh/h]	19	370	336	72	71	11
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.20	0.02
d_M, Delay for Movement [s/veh]	8.18	0.00	0.00	0.00	17.61	10.43
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	1.51	1.51	0.00	0.00	0.73	0.05
95th-Percentile Queue Length [ft]	37.70	37.70	0.00	0.00	18.30	1.24
d_A, Approach Delay [s/veh]	0.40		0.00		16.64	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	1.73					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	21.7
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name				K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name				K St			11th St			11th St		
Base Volume Input [veh/h]	96	283	37	54	233	7	21	104	84	52	121	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	0	0	8	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	96	298	37	54	241	7	21	104	84	52	121	46
Peak Hour Factor	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	79	10	14	64	2	6	28	22	14	32	12
Total Analysis Volume [veh/h]	102	317	39	58	257	7	22	111	89	55	129	49
Pedestrian Volume [ped/h]	17			18			5			12		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	7.84	3.84	2.11	2.34
95th-Percentile Queue Length [ft]	195.88	95.95	52.87	58.50
Approach Delay [s/veh]	30.09	18.83	14.98	15.73
Approach LOS	D	C	B	C
Intersection Delay [s/veh]	21.73			
Intersection LOS	C			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	14	14	8	7	0	0	7	2	13	8	16
Total Analysis Volume [veh/h]	4	54	54	32	27	1	1	28	8	52	32	64
Pedestrian Volume [ped/h]	4			3			3			7		

Intersection Settings

Priority Scheme	Free			Free			Stop			Stop		
Flared Lane							Yes			Yes		
Storage Area [veh]	0			0			1			1		
Two-Stage Gap Acceptance							No			No		
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.04	0.01	0.07	0.05	0.07
d_M, Delay for Movement [s/veh]	7.29	0.00	0.00	7.51	0.00	0.00	10.90	10.68	8.69	10.58	10.70	9.17
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.23	0.23	0.23	0.13	0.13	0.13	0.14	0.14	0.14	0.41	0.41	0.41
95th-Percentile Queue Length [ft]	5.73	5.73	5.73	3.20	3.20	3.20	3.46	3.46	3.46	10.36	10.36	10.36
d_A, Approach Delay [s/veh]	0.26			4.01			10.25			10.00		
Approach LOS	A			A			B			A		
d_I, Intersection Delay [s/veh]	5.96											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.013

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	11	26	9	3	28	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	26	9	3	28	10
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	7	3	1	8	3
Total Analysis Volume [veh/h]	12	29	10	3	31	11
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.03	0.00	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	9.15	8.52	0.00	0.00	7.29	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.13	0.13	0.00	0.00	0.08	0.08
95th-Percentile Queue Length [ft]	3.16	3.16	0.00	0.00	2.01	2.01
d_A, Approach Delay [s/veh]	8.70		0.00		5.38	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.07					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.012

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Peak Hour Factor	0.9140	1.0000	0.9140	0.9140	1.0000	0.9140	1.0000	0.9140	0.9140	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	1	50	0	2	0	2	27	0	0	0
Total Analysis Volume [veh/h]	5	0	5	201	0	7	0	9	108	0	0	0
Pedestrian Volume [ped/h]	0			0			9			9		

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Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.10	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.23	0.00	9.41	0.00	0.00	0.00	0.00	10.37	8.83	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.38	0.38	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.55	0.00	0.55	0.00	0.00	0.00	0.00	9.60	9.60	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.82			0.00			8.95			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	3.42											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	11.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.153

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	87	27	89	19	8	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	87	27	89	19	8	181
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	7	23	5	2	47
Total Analysis Volume [veh/h]	91	28	93	20	8	189
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.15	0.02	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	11.82	9.67	7.44	0.00
Movement LOS	A	A	B	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.54	0.54	0.46	0.46
95th-Percentile Queue Length [ft]	0.00	0.00	13.49	13.49	11.43	11.43
d_A, Approach Delay [s/veh]	0.00		11.44		0.30	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	3.15					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	13.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	95	95	183	225	158	392
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	0	0	0	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	97	95	183	225	158	400
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	26	51	63	44	111
Total Analysis Volume [veh/h]	108	106	203	250	176	444
Pedestrian Volume [ped/h]	75		0		0	

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.22	1.83	2.16	1.51	1.61	1.61
95th-Percentile Queue Length [ft]	55.41	45.73	53.91	37.68	40.35	40.35
Approach Delay [s/veh]	16.11	13.70		12.13		
Approach LOS	C	B		B		
Intersection Delay [s/veh]	13.35					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	47.2
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.507

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	74	0	118	0	0	0	93	430	0	0	251	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	0	0	0	0	0	3	8	0	0	2	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	76	0	118	0	0	0	96	438	0	0	253	67
Peak Hour Factor	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	0	33	0	0	0	27	122	0	0	70	19
Total Analysis Volume [veh/h]	84	0	131	0	0	0	107	487	0	0	281	74
Pedestrian Volume [ped/h]	75			0			0			0		

Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.51	0.00	0.23	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	47.20	26.71	11.99	0.00	0.00	0.00	8.28	0.00	0.00	0.00	0.00	0.00
Movement LOS	E	D	B				A	A			A	A
95th-Percentile Queue Length [veh]	2.48	0.38	0.38	0.00	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	62.06	9.48	9.48	0.00	0.00	0.00	7.30	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	25.75			0.00			1.49			0.00		
Approach LOS	D			A			A			A		
d_I, Intersection Delay [s/veh]	5.52											
Intersection LOS	E											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	14.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	35	7	11	311	391	190	128	201	46	90	123	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	0	0	0	0	1	8	11	5	0	4	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	36	7	11	311	391	191	136	212	51	90	127	112
Peak Hour Factor	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	2	3	85	107	52	37	58	14	25	35	31
Total Analysis Volume [veh/h]	39	8	12	340	427	209	148	231	56	98	139	122
Pedestrian Volume [ped/h]	60			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.31	4.66	1.78	1.78	1.47	1.29	2.32	0.33	0.78	1.14	0.85
95th-Percentile Queue Length [ft]	7.79	116.5	44.38	44.38	36.65	32.35	57.93	8.26	19.60	28.49	21.37
Approach Delay [s/veh]	9.37	15.66				14.03			12.16		
Approach LOS	A	C				B			B		
Intersection Delay [s/veh]	14.38										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6 Foster-Jay/Sunset AM Existing + Canyon Creek

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	29	2.0	0.207	5.2	LOS A	1.0	25.1	0.42	0.30	22.9
8	T1	2	2.0	0.207	5.2	LOS A	1.0	25.1	0.42	0.30	23.0
18	R2	196	2.0	0.207	5.2	LOS A	1.0	25.1	0.42	0.30	22.7
Approach		227	2.0	0.207	5.2	LOS A	1.0	25.1	0.42	0.30	22.7
East: Sunset Ave											
1	L2	203	2.0	0.289	5.2	LOS A	1.7	42.2	0.16	0.05	22.8
6	T1	178	2.0	0.289	5.2	LOS A	1.7	42.2	0.16	0.05	22.9
16	R2	12	2.0	0.289	5.2	LOS A	1.7	42.2	0.16	0.05	22.6
Approach		393	2.0	0.289	5.2	LOS A	1.7	42.2	0.16	0.05	22.8
North: Jay Street											
7	L2	53	2.0	0.074	4.6	LOS A	0.3	7.8	0.48	0.37	22.8
4	T1	14	2.0	0.074	4.6	LOS A	0.3	7.8	0.48	0.37	22.8
14	R2	1	2.0	0.074	4.6	LOS A	0.3	7.8	0.48	0.37	22.6
Approach		69	2.0	0.074	4.6	LOS A	0.3	7.8	0.48	0.37	22.8
West: Sunset Ave											
5	L2	1	2.0	0.188	5.1	LOS A	0.9	22.4	0.44	0.32	23.2
2	T1	189	2.0	0.188	5.1	LOS A	0.9	22.4	0.44	0.32	23.2
12	R2	11	2.0	0.188	5.1	LOS A	0.9	22.4	0.44	0.32	22.9
Approach		201	2.0	0.188	5.1	LOS A	0.9	22.4	0.44	0.32	23.2
All Vehicles		890	2.0	0.289	5.1	LOS A	1.7	42.2	0.31	0.20	22.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	18.3
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	3	232	116	120	290	3	5	11	8	185	5	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	1	1	0	0	0	0	0	5	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	232	117	121	290	3	5	11	8	190	5	68
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	64	33	34	81	1	1	3	2	53	1	19
Total Analysis Volume [veh/h]	3	258	130	134	322	3	6	12	9	211	6	76
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.11	6.24	0.17	2.18	0.50
95th-Percentile Queue Length [ft]	102.87	156.10	4.23	54.45	12.38
Approach Delay [s/veh]	16.89	22.54	10.54	14.14	
Approach LOS	C	C	B	B	
Intersection Delay [s/veh]	18.27				
Intersection LOS	C				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	12.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	1	83	57	3	122	80
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	83	57	3	122	80
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	23	16	1	34	22
Total Analysis Volume [veh/h]	1	92	63	3	136	89
Pedestrian Volume [ped/h]	9		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.09	0.00	0.00	0.09	0.00
d_M, Delay for Movement [s/veh]	12.33	9.07	0.00	0.00	7.62	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.32	0.32	0.00	0.00	0.52	0.52
95th-Percentile Queue Length [ft]	7.92	7.92	0.00	0.00	13.08	13.08
d_A, Approach Delay [s/veh]	9.10		0.00		4.60	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.90					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	21.2
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.378

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	21	247	321	173	121	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	5	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	248	326	173	121	20
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	69	91	48	34	6
Total Analysis Volume [veh/h]	23	276	362	192	134	22
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.38	0.04
d_M, Delay for Movement [s/veh]	8.62	0.00	0.00	0.00	21.23	11.20
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	1.23	1.23	0.00	0.00	1.72	0.11
95th-Percentile Queue Length [ft]	30.84	30.84	0.00	0.00	42.99	2.84
d_A, Approach Delay [s/veh]	0.66		0.00		19.81	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	3.26					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	14.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	K St			K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	K St			K St			11th St			11th St		
Base Volume Input [veh/h]	109	143	16	37	182	6	38	153	112	32	73	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	5	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	109	144	16	37	187	6	38	153	112	32	73	27
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	40	4	10	52	2	11	43	31	9	20	8
Total Analysis Volume [veh/h]	121	160	18	41	208	7	42	170	124	36	81	30
Pedestrian Volume [ped/h]	9			9			6			6		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.76	2.15	3.19	1.01
95th-Percentile Queue Length [ft]	68.97	53.72	79.80	25.37
Approach Delay [s/veh]	14.73	13.50	15.20	11.43
Approach LOS	B	B	C	B
Intersection Delay [s/veh]	14.11			
Intersection LOS	B			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	12.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.008

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	16	15	18	17	1	1	6	2	14	5	13
Total Analysis Volume [veh/h]	2	62	60	70	68	2	4	26	7	58	20	50
Pedestrian Volume [ped/h]	5			5			4			4		

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Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.05	0.00	0.00	0.01	0.05	0.01	0.10	0.04	0.05
d_M, Delay for Movement [s/veh]	7.37	0.00	0.00	7.60	0.00	0.00	12.08	11.91	9.01	11.96	11.97	9.42
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.27	0.27	0.27	0.32	0.32	0.32	0.17	0.17	0.17	0.48	0.48	0.48
95th-Percentile Queue Length [ft]	6.65	6.65	6.65	7.97	7.97	7.97	4.37	4.37	4.37	11.90	11.90	11.90
d_A, Approach Delay [s/veh]	0.12			3.80			11.38			10.97		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	5.53											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	4	53	5	3	75	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	53	5	3	75	5
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	15	1	1	21	1
Total Analysis Volume [veh/h]	4	59	6	3	83	6
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.05	0.00	0.00	0.05	0.00
d_M, Delay for Movement [s/veh]	9.91	8.57	0.00	0.00	7.36	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.19	0.19	0.00	0.00	0.18	0.18
95th-Percentile Queue Length [ft]	4.79	4.79	0.00	0.00	4.38	4.38
d_A, Approach Delay [s/veh]	8.65		0.00		6.86	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.18					
Intersection LOS	A					

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Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Peak Hour Factor	0.9340	1.0000	0.9340	0.9340	1.0000	0.9340	1.0000	0.9340	0.9340	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	0	6	37	0	3	0	2	42	0	0	0
Total Analysis Volume [veh/h]	24	0	22	148	0	11	0	9	167	0	0	0
Pedestrian Volume [ped/h]	0			0			11			11		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.16	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.97	0.00	9.22	0.00	0.00	0.00	0.00	10.30	9.10	0.00	0.00	0.00
Movement LOS	A		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.10	0.00	0.10	0.00	0.00	0.00	0.00	0.61	0.61	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	2.52	0.00	2.52	0.00	0.00	0.00	0.00	15.19	15.19	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.61			0.00			9.16			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	5.39											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	12.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.129

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	160	93	68	25	18	129
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	160	93	68	25	18	129
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	24	18	7	5	34
Total Analysis Volume [veh/h]	168	97	71	26	19	135
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.13	0.03	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	12.26	10.08	7.70	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.44	0.44	0.38	0.38
95th-Percentile Queue Length [ft]	0.00	0.00	11.06	11.06	9.61	9.61
d_A, Approach Delay [s/veh]	0.00		11.68		0.95	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	2.48					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	37.8
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	280	155	170	243	307	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	10	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	290	155	170	243	307	186
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	78	42	46	65	83	50
Total Analysis Volume [veh/h]	312	167	183	261	330	200
Pedestrian Volume [ped/h]	147		0		0	

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	14.10	1.88	2.93	5.59	0.66	0.66
95th-Percentile Queue Length [ft]	352.52	46.97	73.20	139.73	16.61	16.61
Approach Delay [s/veh]	75.67	16.54		21.25		
Approach LOS	F	C		C		
Intersection Delay [s/veh]	37.75					
Intersection LOS	E					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	82.0
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.777

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	103	4	254	0	0	0	114	236	0	0	282	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	10	0	0	0	0	0	2	5	0	0	10	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	113	4	254	0	0	0	116	241	0	0	292	241
Peak Hour Factor	0.9490	0.9490	0.9490	1.0000	1.0000	1.0000	0.9490	0.9490	1.0000	1.0000	0.9490	0.9490
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	1	67	0	0	0	31	63	0	0	77	63
Total Analysis Volume [veh/h]	119	4	268	0	0	0	122	254	0	0	308	254
Pedestrian Volume [ped/h]	146			0			0			0		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.78	0.03	0.34	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	82.00	32.19	10.70	0.00	0.00	0.00	9.06	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	D	B				A	A			A	A
95th-Percentile Queue Length [veh]	4.88	0.73	0.68	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	122.00	18.21	16.91	0.00	0.00	0.00	10.27	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	32.62			0.00			2.94			0.00		
Approach LOS	D			A			A			A		
d_I, Intersection Delay [s/veh]	10.43											
Intersection LOS	F											

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Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	11.6
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	75	30	26	149	279	101	67	175	60	111	152	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	6	0	0	0	0	4	5	7	3	0	20	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	81	30	26	149	279	105	72	182	63	111	172	116
Peak Hour Factor	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	8	7	39	73	27	19	47	16	29	45	30
Total Analysis Volume [veh/h]	84	31	27	155	290	109	75	189	66	116	179	121
Pedestrian Volume [ped/h]	112			0			0			0		

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Version 4.00-02

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.92	1.24	1.03	1.03	0.63	0.52	1.58	0.37	0.89	1.46	0.76
95th-Percentile Queue Length [ft]	23.03	30.88	25.67	25.67	15.67	13.07	39.46	9.35	22.24	36.50	18.97
Approach Delay [s/veh]	10.90	11.34				11.91			11.86		
Approach LOS	B	B				B			B		
Intersection Delay [s/veh]	11.58										
Intersection LOS	B										

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MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset PM Existing + Canyon Creek

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	8	2.0	0.169	4.4	LOS A	0.8	20.3	0.32	0.18	23.2
8	T1	20	2.0	0.169	4.4	LOS A	0.8	20.3	0.32	0.18	23.2
18	R2	175	2.0	0.169	4.4	LOS A	0.8	20.3	0.32	0.18	22.9
Approach		203	2.0	0.169	4.4	LOS A	0.8	20.3	0.32	0.18	23.0
East: Sunset Ave											
1	L2	192	2.0	0.273	5.0	LOS A	1.5	39.1	0.15	0.05	22.8
6	T1	116	2.0	0.273	5.0	LOS A	1.5	39.1	0.15	0.05	22.9
16	R2	65	2.0	0.273	5.0	LOS A	1.5	39.1	0.15	0.05	22.6
Approach		373	2.0	0.273	5.0	LOS A	1.5	39.1	0.15	0.05	22.8
North: Jay Street											
7	L2	49	2.0	0.066	4.1	LOS A	0.3	7.0	0.43	0.30	22.9
4	T1	15	2.0	0.066	4.1	LOS A	0.3	7.0	0.43	0.30	23.0
14	R2	2	2.0	0.066	4.1	LOS A	0.3	7.0	0.43	0.30	22.7
Approach		67	2.0	0.066	4.1	LOS A	0.3	7.0	0.43	0.30	22.9
West: Sunset Ave											
5	L2	1	2.0	0.103	4.2	LOS A	0.4	11.4	0.40	0.27	23.4
2	T1	99	2.0	0.103	4.2	LOS A	0.4	11.4	0.40	0.27	23.4
12	R2	11	2.0	0.103	4.2	LOS A	0.4	11.4	0.40	0.27	23.1
Approach		111	2.0	0.103	4.2	LOS A	0.4	11.4	0.40	0.27	23.4
All Vehicles		754	2.0	0.273	4.6	LOS A	1.5	39.1	0.26	0.14	22.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	25.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	13	354	113	100	322	6	5	16	12	109	20	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	6	4	0	0	0	0	0	3	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	354	119	104	322	6	5	16	12	112	20	126
Peak Hour Factor	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	96	32	28	88	2	1	4	3	31	5	34
Total Analysis Volume [veh/h]	14	386	130	113	351	7	5	17	13	122	22	137
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	9.04	7.28	0.24	1.07	1.24
95th-Percentile Queue Length [ft]	226.03	182.09	5.95	26.67	31.05
Approach Delay [s/veh]	31.00	26.47	11.20	12.79	
Approach LOS	D	D	B	B	
Intersection Delay [s/veh]	24.97				
Intersection LOS	C				

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Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	10.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	3	37	41	3	56	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	37	41	3	56	36
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	10	11	1	16	10
Total Analysis Volume [veh/h]	3	41	46	3	62	40
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.04	0.00	0.00	0.04	0.00
d_M, Delay for Movement [s/veh]	10.00	8.69	0.00	0.00	7.41	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.14	0.14	0.00	0.00	0.21	0.21
95th-Percentile Queue Length [ft]	3.46	3.46	0.00	0.00	5.25	5.25
d_A, Approach Delay [s/veh]	8.78		0.00		4.50	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.34					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	17.3
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.195

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	18	340	315	69	68	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	3	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	346	318	69	68	11
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	90	83	18	18	3
Total Analysis Volume [veh/h]	19	360	331	72	71	11
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.20	0.02
d_M, Delay for Movement [s/veh]	8.17	0.00	0.00	0.00	17.29	10.39
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	1.44	1.44	0.00	0.00	0.71	0.05
95th-Percentile Queue Length [ft]	36.06	36.06	0.00	0.00	17.85	1.24
d_A, Approach Delay [s/veh]	0.41		0.00		16.36	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	1.73					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	20.7
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name				K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name				K St			11th St			11th St		
Base Volume Input [veh/h]	96	283	37	54	233	7	21	104	84	52	121	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	0	3	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	96	289	37	54	236	7	21	104	84	52	121	46
Peak Hour Factor	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	77	10	14	63	2	6	28	22	14	32	12
Total Analysis Volume [veh/h]	102	308	39	58	251	7	22	111	89	55	129	49
Pedestrian Volume [ped/h]	17			18			5			12		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	7.32	3.64	2.08	2.30
95th-Percentile Queue Length [ft]	183.11	91.10	51.95	57.48
Approach Delay [s/veh]	28.11	18.19	14.76	15.48
Approach LOS	D	C	B	C
Intersection Delay [s/veh]	20.70			
Intersection LOS	C			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	14	14	8	7	0	0	7	2	13	8	16
Total Analysis Volume [veh/h]	4	54	54	32	27	1	1	28	8	52	32	64
Pedestrian Volume [ped/h]	4			3			3			7		

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Intersection Settings

Priority Scheme	Free			Free			Stop			Stop		
Flared Lane							Yes			Yes		
Storage Area [veh]	0			0			1			1		
Two-Stage Gap Acceptance							No			No		
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.04	0.01	0.07	0.05	0.07
d_M, Delay for Movement [s/veh]	7.29	0.00	0.00	7.51	0.00	0.00	10.90	10.68	8.69	10.58	10.70	9.17
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.23	0.23	0.23	0.13	0.13	0.13	0.14	0.14	0.14	0.41	0.41	0.41
95th-Percentile Queue Length [ft]	5.73	5.73	5.73	3.20	3.20	3.20	3.46	3.46	3.46	10.36	10.36	10.36
d_A, Approach Delay [s/veh]	0.26			4.01			10.25			10.00		
Approach LOS	A			A			B			A		
d_I, Intersection Delay [s/veh]	5.96											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.013

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	11	26	9	3	28	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	26	9	3	28	10
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	7	3	1	8	3
Total Analysis Volume [veh/h]	12	29	10	3	31	11
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.03	0.00	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	9.15	8.52	0.00	0.00	7.29	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.13	0.13	0.00	0.00	0.08	0.08
95th-Percentile Queue Length [ft]	3.16	3.16	0.00	0.00	2.01	2.01
d_A, Approach Delay [s/veh]	8.70		0.00		5.38	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.07					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.012

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Peak Hour Factor	0.9140	1.0000	0.9140	0.9140	1.0000	0.9140	1.0000	0.9140	0.9140	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	1	50	0	2	0	2	27	0	0	0
Total Analysis Volume [veh/h]	5	0	5	201	0	7	0	9	108	0	0	0
Pedestrian Volume [ped/h]	0			0			9			9		

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Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.10	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.23	0.00	9.41	0.00	0.00	0.00	0.00	10.37	8.83	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.38	0.38	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.55	0.00	0.55	0.00	0.00	0.00	0.00	9.60	9.60	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.82			0.00			8.95			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	3.42											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	11.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.153

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	87	27	89	19	8	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	87	27	89	19	8	181
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	7	23	5	2	47
Total Analysis Volume [veh/h]	91	28	93	20	8	189
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.15	0.02	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	11.82	9.67	7.44	0.00
Movement LOS	A	A	B	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.54	0.54	0.46	0.46
95th-Percentile Queue Length [ft]	0.00	0.00	13.49	13.49	11.43	11.43
d_A, Approach Delay [s/veh]	0.00		11.44		0.30	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	3.15					
Intersection LOS	B					

APPENDIX T.1

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Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	13.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	95	95	183	225	158	392
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	4	0	0	0	0	14
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	99	95	183	225	158	406
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	26	51	63	44	113
Total Analysis Volume [veh/h]	110	106	203	250	176	451
Pedestrian Volume [ped/h]	75		0		0	

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.26	1.84	2.17	1.51	1.66	1.66
95th-Percentile Queue Length [ft]	56.52	45.98	54.26	37.77	41.42	41.42
Approach Delay [s/veh]	16.27	13.77		12.21		
Approach LOS	C	B		B		
Intersection Delay [s/veh]	13.43					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	50.6
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.538

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	74	0	118	0	0	0	93	430	0	0	251	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	4	0	0	0	0	0	6	14	0	0	4	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	78	0	118	0	0	0	99	444	0	0	255	67
Peak Hour Factor	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	0	33	0	0	0	28	123	0	0	71	19
Total Analysis Volume [veh/h]	87	0	131	0	0	0	110	493	0	0	283	74
Pedestrian Volume [ped/h]	75			0			0			0		

Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.54	0.00	0.23	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	50.58	27.19	12.05	0.00	0.00	0.00	8.30	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	D	B				A	A			A	A
95th-Percentile Queue Length [veh]	2.71	0.38	0.38	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	67.72	9.57	9.57	0.00	0.00	0.00	7.54	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	27.43			0.00			1.51			0.00		
Approach LOS	D			A			A			A		
d_I, Intersection Delay [s/veh]	5.85											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	14.6
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	35	7	11	311	391	190	128	201	46	90	123	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	0	0	0	0	2	15	20	9	0	8	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	37	7	11	311	391	192	143	221	55	90	131	112
Peak Hour Factor	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	2	3	85	107	52	39	60	15	25	36	31
Total Analysis Volume [veh/h]	40	8	12	340	427	210	156	241	60	98	143	122
Pedestrian Volume [ped/h]	60			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.31	4.72	1.79	1.79	1.49	1.40	2.50	0.36	0.79	1.19	0.86
95th-Percentile Queue Length [ft]	7.85	118.0	44.83	44.83	37.31	34.93	62.46	8.94	19.68	29.76	21.49
Approach Delay [s/veh]	9.31	15.83				14.39			12.26		
Approach LOS	A	C				B			B		
Intersection Delay [s/veh]	14.57										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset AM Existing + Sunset Terrace

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	29	2.0	0.244	5.5	LOS A	1.2	31.0	0.42	0.29	22.9
8	T1	1	2.0	0.244	5.5	LOS A	1.2	31.0	0.42	0.29	22.9
18	R2	244	2.0	0.244	5.5	LOS A	1.2	31.0	0.42	0.29	22.7
Approach		274	2.0	0.244	5.5	LOS A	1.2	31.0	0.42	0.29	22.7
East: Sunset Ave											
1	L2	217	2.0	0.293	5.2	LOS A	1.7	43.1	0.16	0.05	22.8
6	T1	178	2.0	0.293	5.2	LOS A	1.7	43.1	0.16	0.05	22.8
16	R2	6	2.0	0.293	5.2	LOS A	1.7	43.1	0.16	0.05	22.6
Approach		400	2.0	0.293	5.2	LOS A	1.7	43.1	0.16	0.05	22.8
North: Jay Street											
7	L2	27	2.0	0.036	4.3	LOS A	0.1	3.7	0.48	0.35	22.8
4	T1	6	2.0	0.036	4.3	LOS A	0.1	3.7	0.48	0.35	22.9
14	R2	1	2.0	0.036	4.3	LOS A	0.1	3.7	0.48	0.35	22.6
Approach		33	2.0	0.036	4.3	LOS A	0.1	3.7	0.48	0.35	22.8
West: Sunset Ave											
5	L2	1	2.0	0.184	4.9	LOS A	0.9	21.9	0.42	0.30	23.2
2	T1	189	2.0	0.184	4.9	LOS A	0.9	21.9	0.42	0.30	23.2
12	R2	11	2.0	0.184	4.9	LOS A	0.9	21.9	0.42	0.30	23.0
Approach		201	2.0	0.184	4.9	LOS A	0.9	21.9	0.42	0.30	23.2
All Vehicles		909	2.0	0.293	5.2	LOS A	1.7	43.1	0.31	0.19	22.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	18.6
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	3	232	116	120	290	3	5	11	8	185	5	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	2	2	0	0	0	0	0	9	0	6
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	232	118	122	290	3	5	11	8	194	5	71
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	64	33	34	81	1	1	3	2	54	1	20
Total Analysis Volume [veh/h]	3	258	131	136	322	3	6	12	9	216	6	79
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.19	6.41	0.17	2.27	0.52
95th-Percentile Queue Length [ft]	104.84	160.13	4.26	56.84	12.95
Approach Delay [s/veh]	17.16	23.12	10.60	14.36	
Approach LOS	C	C	B	B	
Intersection Delay [s/veh]	18.62				
Intersection LOS	C				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	12.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	1	83	57	3	122	80
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	83	57	3	122	80
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	23	16	1	34	22
Total Analysis Volume [veh/h]	1	92	63	3	136	89
Pedestrian Volume [ped/h]	9		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.09	0.00	0.00	0.09	0.00
d_M, Delay for Movement [s/veh]	12.33	9.07	0.00	0.00	7.62	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.32	0.32	0.00	0.00	0.52	0.52
95th-Percentile Queue Length [ft]	7.92	7.92	0.00	0.00	13.08	13.08
d_A, Approach Delay [s/veh]	9.10		0.00		4.60	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.90					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	21.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.382

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	21	247	321	173	121	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	2	9	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	249	330	173	121	20
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	69	92	48	34	6
Total Analysis Volume [veh/h]	23	277	367	192	134	22
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.38	0.04
d_M, Delay for Movement [s/veh]	8.64	0.00	0.00	0.00	21.44	11.24
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	1.25	1.25	0.00	0.00	1.74	0.11
95th-Percentile Queue Length [ft]	31.17	31.17	0.00	0.00	43.50	2.86
d_A, Approach Delay [s/veh]	0.66		0.00		20.00	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	3.27					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	14.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	K St			K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	K St			K St			11th St			11th St		
Base Volume Input [veh/h]	109	143	16	37	182	6	38	153	112	32	73	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	2	0	0	9	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	109	145	16	37	191	6	38	153	112	32	73	27
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	40	4	10	53	2	11	43	31	9	20	8
Total Analysis Volume [veh/h]	121	161	18	41	212	7	42	170	124	36	81	30
Pedestrian Volume [ped/h]	9			9			6			6		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.79	2.21	3.21	1.02
95th-Percentile Queue Length [ft]	69.69	55.24	80.32	25.49
Approach Delay [s/veh]	14.83	13.65	15.29	11.47
Approach LOS	B	B	C	B
Intersection Delay [s/veh]	14.21			
Intersection LOS	B			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	12.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.008

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	16	15	18	17	1	1	6	2	14	5	13
Total Analysis Volume [veh/h]	2	62	60	70	68	2	4	26	7	58	20	50
Pedestrian Volume [ped/h]	5			5			4			4		

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.05	0.00	0.00	0.01	0.05	0.01	0.10	0.04	0.05
d_M, Delay for Movement [s/veh]	7.37	0.00	0.00	7.60	0.00	0.00	12.08	11.91	9.01	11.96	11.97	9.42
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.27	0.27	0.27	0.32	0.32	0.32	0.17	0.17	0.17	0.48	0.48	0.48
95th-Percentile Queue Length [ft]	6.65	6.65	6.65	7.97	7.97	7.97	4.37	4.37	4.37	11.90	11.90	11.90
d_A, Approach Delay [s/veh]	0.12			3.80			11.38			10.97		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	5.53											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	4	53	5	3	75	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	53	5	3	75	5
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	15	1	1	21	1
Total Analysis Volume [veh/h]	4	59	6	3	83	6
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.05	0.00	0.00	0.05	0.00
d_M, Delay for Movement [s/veh]	9.91	8.57	0.00	0.00	7.36	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.19	0.19	0.00	0.00	0.18	0.18
95th-Percentile Queue Length [ft]	4.79	4.79	0.00	0.00	4.38	4.38
d_A, Approach Delay [s/veh]	8.65		0.00		6.86	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.18					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Peak Hour Factor	0.9340	1.0000	0.9340	0.9340	1.0000	0.9340	1.0000	0.9340	0.9340	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	0	6	37	0	3	0	2	42	0	0	0
Total Analysis Volume [veh/h]	24	0	22	148	0	11	0	9	167	0	0	0
Pedestrian Volume [ped/h]	0			0			11			11		

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Stop		Free	
Flared Lane	Yes				No			
Storage Area [veh]	1		0		0		0	
Two-Stage Gap Acceptance	No				No			
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.16	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.97	0.00	9.22	0.00	0.00	0.00	0.00	10.30	9.10	0.00	0.00	0.00
Movement LOS	A		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.10	0.00	0.10	0.00	0.00	0.00	0.00	0.61	0.61	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	2.52	0.00	2.52	0.00	0.00	0.00	0.00	15.19	15.19	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.61			0.00			9.16			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	5.39											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	12.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.129

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	160	93	68	25	18	129
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	160	93	68	25	18	129
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	24	18	7	5	34
Total Analysis Volume [veh/h]	168	97	71	26	19	135
Pedestrian Volume [ped/h]	0		0		0	

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.13	0.03	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	12.26	10.08	7.70	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.44	0.44	0.38	0.38
95th-Percentile Queue Length [ft]	0.00	0.00	11.06	11.06	9.61	9.61
d_A, Approach Delay [s/veh]	0.00		11.68		0.95	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	2.48					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	39.2
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	280	155	170	243	307	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	0	0	0	0	9
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	296	155	170	243	307	190
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	80	42	46	65	83	51
Total Analysis Volume [veh/h]	318	167	183	261	330	204
Pedestrian Volume [ped/h]	147		0		0	

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	14.63	1.88	2.93	5.59	0.68	0.68
95th-Percentile Queue Length [ft]	365.71	47.04	73.33	139.77	17.02	17.02
Approach Delay [s/veh]	79.71	16.57		21.20		
Approach LOS	F	C		C		
Intersection Delay [s/veh]	39.19					
Intersection LOS	E					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	93.4
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.833

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	103	4	254	0	0	0	114	236	0	0	282	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	0	0	0	0	0	3	9	0	0	16	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	119	4	254	0	0	0	117	245	0	0	298	241
Peak Hour Factor	0.9490	0.9490	0.9490	1.0000	1.0000	1.0000	0.9490	0.9490	1.0000	1.0000	0.9490	0.9490
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	31	1	67	0	0	0	31	65	0	0	79	63
Total Analysis Volume [veh/h]	125	4	268	0	0	0	123	258	0	0	314	254
Pedestrian Volume [ped/h]	146			0			0			0		

Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.83	0.03	0.34	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	93.45	32.69	10.74	0.00	0.00	0.00	9.08	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	D	B				A	A			A	A
95th-Percentile Queue Length [veh]	5.46	0.73	0.68	0.00	0.00	0.00	0.42	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	136.45	18.37	17.03	0.00	0.00	0.00	10.43	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	37.00			0.00			2.93			0.00		
Approach LOS	E			A			A			A		
d_I, Intersection Delay [s/veh]	11.74											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	11.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	75	30	26	149	279	101	67	175	60	111	152	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	9	0	0	0	0	6	9	12	5	0	32	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	84	30	26	149	279	107	76	187	65	111	184	116
Peak Hour Factor	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	8	7	39	73	28	20	49	17	29	48	30
Total Analysis Volume [veh/h]	87	31	27	155	290	111	79	195	68	116	191	121
Pedestrian Volume [ped/h]	112			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.94	1.25	1.04	1.04	0.65	0.56	1.66	0.39	0.89	1.61	0.76
95th-Percentile Queue Length [ft]	23.55	31.17	25.92	25.92	16.18	13.95	41.57	9.71	22.32	40.33	19.07
Approach Delay [s/veh]	10.91	11.43				12.08			12.08		
Approach LOS	B	B				B			B		
Intersection Delay [s/veh]	11.72										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset PM Existing + Sunset Terrace

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	8	2.0	0.180	4.5	LOS A	0.9	22.0	0.31	0.17	23.2
8	T1	9	2.0	0.180	4.5	LOS A	0.9	22.0	0.31	0.17	23.2
18	R2	202	2.0	0.180	4.5	LOS A	0.9	22.0	0.31	0.17	22.9
Approach		219	2.0	0.180	4.5	LOS A	0.9	22.0	0.31	0.17	22.9
East: Sunset Ave											
1	L2	240	2.0	0.282	5.0	LOS A	1.6	41.2	0.11	0.03	22.8
6	T1	116	2.0	0.282	5.0	LOS A	1.6	41.2	0.11	0.03	22.8
16	R2	34	2.0	0.282	5.0	LOS A	1.6	41.2	0.11	0.03	22.5
Approach		390	2.0	0.282	5.0	LOS A	1.6	41.2	0.11	0.03	22.8
North: Jay Street											
7	L2	34	2.0	0.048	4.1	LOS A	0.2	5.0	0.45	0.32	22.9
4	T1	10	2.0	0.048	4.1	LOS A	0.2	5.0	0.45	0.32	22.9
14	R2	2	2.0	0.048	4.1	LOS A	0.2	5.0	0.45	0.32	22.7
Approach		46	2.0	0.048	4.1	LOS A	0.2	5.0	0.45	0.32	22.9
West: Sunset Ave											
5	L2	1	2.0	0.106	4.3	LOS A	0.5	11.7	0.42	0.29	23.3
2	T1	99	2.0	0.106	4.3	LOS A	0.5	11.7	0.42	0.29	23.4
12	R2	11	2.0	0.106	4.3	LOS A	0.5	11.7	0.42	0.29	23.1
Approach		111	2.0	0.106	4.3	LOS A	0.5	11.7	0.42	0.29	23.3
All Vehicles		767	2.0	0.282	4.7	LOS A	1.6	41.2	0.23	0.13	22.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	25.5
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	13	354	113	100	322	6	5	16	12	109	20	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	9	6	0	0	0	0	0	5	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	354	122	106	322	6	5	16	12	114	20	127
Peak Hour Factor	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	96	33	29	88	2	1	4	3	31	5	35
Total Analysis Volume [veh/h]	14	386	133	115	351	7	5	17	13	124	22	138
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	9.26	7.43	0.24	1.09	1.26
95th-Percentile Queue Length [ft]	231.51	185.81	5.98	27.35	31.44
Approach Delay [s/veh]	31.87	27.04	11.24	12.88	
Approach LOS	D	D	B	B	
Intersection Delay [s/veh]	25.53				
Intersection LOS	D				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	10.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	3	37	41	3	56	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	37	41	3	56	36
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	10	11	1	16	10
Total Analysis Volume [veh/h]	3	41	46	3	62	40
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.04	0.00	0.00	0.04	0.00
d_M, Delay for Movement [s/veh]	10.00	8.69	0.00	0.00	7.41	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.14	0.14	0.00	0.00	0.21	0.21
95th-Percentile Queue Length [ft]	3.46	3.46	0.00	0.00	5.25	5.25
d_A, Approach Delay [s/veh]	8.78		0.00		4.50	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.34					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	17.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.197

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	18	340	315	69	68	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	9	5	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	349	320	69	68	11
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	91	83	18	18	3
Total Analysis Volume [veh/h]	19	364	333	72	71	11
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.20	0.02
d_M, Delay for Movement [s/veh]	8.17	0.00	0.00	0.00	17.41	10.41
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	1.47	1.47	0.00	0.00	0.72	0.05
95th-Percentile Queue Length [ft]	36.71	36.71	0.00	0.00	18.03	1.24
d_A, Approach Delay [s/veh]	0.41		0.00		16.47	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	1.73					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	21.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name				K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name				K St			11th St			11th St		
Base Volume Input [veh/h]	96	283	37	54	233	7	21	104	84	52	121	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	9	0	0	5	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	96	292	37	54	238	7	21	104	84	52	121	46
Peak Hour Factor	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	78	10	14	63	2	6	28	22	14	32	12
Total Analysis Volume [veh/h]	102	311	39	58	253	7	22	111	89	55	129	49
Pedestrian Volume [ped/h]	17			18			5			12		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	7.49	3.71	2.09	2.31
95th-Percentile Queue Length [ft]	187.26	92.69	52.26	57.82
Approach Delay [s/veh]	28.74	18.40	14.83	15.56
Approach LOS	D	C	B	C
Intersection Delay [s/veh]	21.03			
Intersection LOS	C			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	14	14	8	7	0	0	7	2	13	8	16
Total Analysis Volume [veh/h]	4	54	54	32	27	1	1	28	8	52	32	64
Pedestrian Volume [ped/h]	4			3			3			7		

Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.04	0.01	0.07	0.05	0.07
d_M, Delay for Movement [s/veh]	7.29	0.00	0.00	7.51	0.00	0.00	10.90	10.68	8.69	10.58	10.70	9.17
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.23	0.23	0.23	0.13	0.13	0.13	0.14	0.14	0.14	0.41	0.41	0.41
95th-Percentile Queue Length [ft]	5.73	5.73	5.73	3.20	3.20	3.20	3.46	3.46	3.46	10.36	10.36	10.36
d_A, Approach Delay [s/veh]	0.26			4.01			10.25			10.00		
Approach LOS	A			A			B			A		
d_I, Intersection Delay [s/veh]	5.96											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.013

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	11	26	9	3	28	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	26	9	3	28	10
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	7	3	1	8	3
Total Analysis Volume [veh/h]	12	29	10	3	31	11
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.03	0.00	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	9.15	8.52	0.00	0.00	7.29	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.13	0.13	0.00	0.00	0.08	0.08
95th-Percentile Queue Length [ft]	3.16	3.16	0.00	0.00	2.01	2.01
d_A, Approach Delay [s/veh]	8.70		0.00		5.38	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.07					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.012

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Peak Hour Factor	0.9140	1.0000	0.9140	0.9140	1.0000	0.9140	1.0000	0.9140	0.9140	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	1	50	0	2	0	2	27	0	0	0
Total Analysis Volume [veh/h]	5	0	5	201	0	7	0	9	108	0	0	0
Pedestrian Volume [ped/h]	0			0			9			9		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.10	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.23	0.00	9.41	0.00	0.00	0.00	0.00	10.37	8.83	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.38	0.38	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.55	0.00	0.55	0.00	0.00	0.00	0.00	9.60	9.60	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.82			0.00			8.95			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	3.42											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	11.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.153

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	87	27	89	19	8	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	87	27	89	19	8	181
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	7	23	5	2	47
Total Analysis Volume [veh/h]	91	28	93	20	8	189
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.15	0.02	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	11.82	9.67	7.44	0.00
Movement LOS	A	A	B	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.54	0.54	0.46	0.46
95th-Percentile Queue Length [ft]	0.00	0.00	13.49	13.49	11.43	11.43
d_A, Approach Delay [s/veh]	0.00		11.44		0.30	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	3.15					
Intersection LOS	B					

APPENDIX T.1

Generated with PTV VISTRO

Version 4.00-02

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	13.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	95	95	183	225	158	392
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	0	0	0	0	1
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	98	95	183	225	158	393
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	26	51	63	44	109
Total Analysis Volume [veh/h]	109	106	203	250	176	437
Pedestrian Volume [ped/h]	75		0		0	

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Version 4.00-02

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.23	1.82	2.15	1.51	1.58	1.58
95th-Percentile Queue Length [ft]	55.64	45.61	53.75	37.68	39.41	39.41
Approach Delay [s/veh]	16.11	13.67		12.08		
Approach LOS	C	B		B		
Intersection Delay [s/veh]	13.32					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	49.6
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.547

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	74	0	118	0	0	0	93	430	0	0	251	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	9	0	0	0	0	0	2	1	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	83	0	118	0	0	0	95	431	0	0	254	67
Peak Hour Factor	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	0	33	0	0	0	26	120	0	0	71	19
Total Analysis Volume [veh/h]	92	0	131	0	0	0	106	479	0	0	282	74
Pedestrian Volume [ped/h]	75			0			0			0		

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.55	0.00	0.22	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	49.64	26.42	11.91	0.00	0.00	0.00	8.28	0.00	0.00	0.00	0.00	0.00
Movement LOS	E	D	B				A	A			A	A
95th-Percentile Queue Length [veh]	2.80	0.37	0.37	0.00	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	70.03	9.37	9.37	0.00	0.00	0.00	7.23	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	27.48			0.00			1.50			0.00		
Approach LOS	D			A			A			A		
d_I, Intersection Delay [s/veh]	6.02											
Intersection LOS	E											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	14.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	35	7	11	311	391	190	128	201	46	90	123	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	14	0	0	0	0	6	2	3	3	0	12	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	7	11	311	391	196	130	204	49	90	135	112
Peak Hour Factor	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	2	3	85	107	53	35	56	13	25	37	31
Total Analysis Volume [veh/h]	53	8	12	340	427	214	142	223	53	98	147	122
Pedestrian Volume [ped/h]	60			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.40	4.68	1.78	1.78	1.52	1.23	2.20	0.31	0.79	1.23	0.86
95th-Percentile Queue Length [ft]	9.94	117.0	44.54	44.54	38.08	30.73	55.06	7.82	19.66	30.84	21.44
Approach Delay [s/veh]	9.57	15.72				13.87			12.29		
Approach LOS	A	C				B			B		
Intersection Delay [s/veh]	14.37										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6 Foster-Jay/Sunset AM Existing + Open Door

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	29	2.0	0.208	5.1	LOS A	1.0	25.6	0.40	0.27	23.0
8	T1	1	2.0	0.208	5.1	LOS A	1.0	25.6	0.40	0.27	23.0
18	R2	204	2.0	0.208	5.1	LOS A	1.0	25.6	0.40	0.27	22.7
Approach		234	2.0	0.208	5.1	LOS A	1.0	25.6	0.40	0.27	22.8
East: Sunset Ave											
1	L2	239	2.0	0.309	5.4	LOS A	1.8	46.5	0.16	0.05	22.7
6	T1	178	2.0	0.309	5.4	LOS A	1.8	46.5	0.16	0.05	22.8
16	R2	6	2.0	0.309	5.4	LOS A	1.8	46.5	0.16	0.05	22.5
Approach		422	2.0	0.309	5.4	LOS A	1.8	46.5	0.16	0.05	22.7
North: Jay Street											
7	L2	27	2.0	0.037	4.4	LOS A	0.1	3.8	0.49	0.36	22.8
4	T1	6	2.0	0.037	4.4	LOS A	0.1	3.8	0.49	0.36	22.9
14	R2	1	2.0	0.037	4.4	LOS A	0.1	3.8	0.49	0.36	22.6
Approach		33	2.0	0.037	4.4	LOS A	0.1	3.8	0.49	0.36	22.8
West: Sunset Ave											
5	L2	1	2.0	0.188	5.1	LOS A	0.9	22.4	0.44	0.32	23.2
2	T1	189	2.0	0.188	5.1	LOS A	0.9	22.4	0.44	0.32	23.2
12	R2	11	2.0	0.188	5.1	LOS A	0.9	22.4	0.44	0.32	22.9
Approach		201	2.0	0.188	5.1	LOS A	0.9	22.4	0.44	0.32	23.2
All Vehicles		891	2.0	0.309	5.2	LOS A	1.8	46.5	0.30	0.18	22.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	19.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	3	232	116	120	290	3	5	11	8	185	5	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	14	9	0	0	0	0	0	4	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	232	130	129	290	3	5	11	8	189	5	67
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	64	36	36	81	1	1	3	2	53	1	19
Total Analysis Volume [veh/h]	3	258	144	143	322	3	6	12	9	210	6	74
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.45	6.64	0.17	2.19	0.49
95th-Percentile Queue Length [ft]	111.32	166.00	4.28	54.76	12.17
Approach Delay [s/veh]	17.68	23.76	10.63	14.29	
Approach LOS	C	C	B	B	
Intersection Delay [s/veh]	19.08				
Intersection LOS	C				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	12.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	1	83	57	3	122	80
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	83	57	3	122	80
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	23	16	1	34	22
Total Analysis Volume [veh/h]	1	92	63	3	136	89
Pedestrian Volume [ped/h]	9		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.09	0.00	0.00	0.09	0.00
d_M, Delay for Movement [s/veh]	12.33	9.07	0.00	0.00	7.62	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.32	0.32	0.00	0.00	0.52	0.52
95th-Percentile Queue Length [ft]	7.92	7.92	0.00	0.00	13.08	13.08
d_A, Approach Delay [s/veh]	9.10		0.00		4.60	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.90					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	21.7
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.385

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	21	247	321	173	121	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	14	4	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	261	325	173	121	20
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	73	90	48	34	6
Total Analysis Volume [veh/h]	23	290	361	192	134	22
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.39	0.04
d_M, Delay for Movement [s/veh]	8.62	0.00	0.00	0.00	21.70	11.19
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	1.31	1.31	0.00	0.00	1.76	0.11
95th-Percentile Queue Length [ft]	32.85	32.85	0.00	0.00	44.10	2.83
d_A, Approach Delay [s/veh]	0.63		0.00		20.21	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	3.28					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	14.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	K St			K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	K St			K St			11th St			11th St		
Base Volume Input [veh/h]	109	143	16	37	182	6	38	153	112	32	73	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	14	0	0	4	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	109	157	16	37	186	6	38	153	112	32	73	27
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	44	4	10	52	2	11	43	31	9	20	8
Total Analysis Volume [veh/h]	121	174	18	41	207	7	42	170	124	36	81	30
Pedestrian Volume [ped/h]	9			9			6			6		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.01	2.16	3.24	1.03
95th-Percentile Queue Length [ft]	75.30	54.03	81.12	25.69
Approach Delay [s/veh]	15.33	13.61	15.43	11.54
Approach LOS	C	B	C	B
Intersection Delay [s/veh]	14.42			
Intersection LOS	B			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	12.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.008

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	16	15	18	17	1	1	6	2	14	5	13
Total Analysis Volume [veh/h]	2	62	60	70	68	2	4	26	7	58	20	50
Pedestrian Volume [ped/h]	5			5			4			4		

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Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.05	0.00	0.00	0.01	0.05	0.01	0.10	0.04	0.05
d_M, Delay for Movement [s/veh]	7.37	0.00	0.00	7.60	0.00	0.00	12.08	11.91	9.01	11.96	11.97	9.42
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.27	0.27	0.27	0.32	0.32	0.32	0.17	0.17	0.17	0.48	0.48	0.48
95th-Percentile Queue Length [ft]	6.65	6.65	6.65	7.97	7.97	7.97	4.37	4.37	4.37	11.90	11.90	11.90
d_A, Approach Delay [s/veh]	0.12			3.80			11.38			10.97		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	5.53											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	4	53	5	3	75	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	53	5	3	75	5
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	15	1	1	21	1
Total Analysis Volume [veh/h]	4	59	6	3	83	6
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.05	0.00	0.00	0.05	0.00
d_M, Delay for Movement [s/veh]	9.91	8.57	0.00	0.00	7.36	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.19	0.19	0.00	0.00	0.18	0.18
95th-Percentile Queue Length [ft]	4.79	4.79	0.00	0.00	4.38	4.38
d_A, Approach Delay [s/veh]	8.65		0.00		6.86	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.18					
Intersection LOS	A					

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Intersection Level Of Service Report

Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Peak Hour Factor	0.9340	1.0000	0.9340	0.9340	1.0000	0.9340	1.0000	0.9340	0.9340	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	0	6	37	0	3	0	2	42	0	0	0
Total Analysis Volume [veh/h]	24	0	22	148	0	11	0	9	167	0	0	0
Pedestrian Volume [ped/h]	0			0			11			11		

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Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.16	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.97	0.00	9.22	0.00	0.00	0.00	0.00	10.30	9.10	0.00	0.00	0.00
Movement LOS	A		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.10	0.00	0.10	0.00	0.00	0.00	0.00	0.61	0.61	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	2.52	0.00	2.52	0.00	0.00	0.00	0.00	15.19	15.19	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.61			0.00			9.16			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	5.39											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	12.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.129

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	160	93	68	25	18	129
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	160	93	68	25	18	129
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	24	18	7	5	34
Total Analysis Volume [veh/h]	168	97	71	26	19	135
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.13	0.03	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	12.26	10.08	7.70	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.44	0.44	0.38	0.38
95th-Percentile Queue Length [ft]	0.00	0.00	11.06	11.06	9.61	9.61
d_A, Approach Delay [s/veh]	0.00		11.68		0.95	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	2.48					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	35.9
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	280	155	170	243	307	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	0	0	0	0	4
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	282	155	170	243	307	185
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	76	42	46	65	83	50
Total Analysis Volume [veh/h]	303	167	183	261	330	199
Pedestrian Volume [ped/h]	147		0		0	

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	13.40	1.88	2.93	5.59	0.66	0.66
95th-Percentile Queue Length [ft]	335.01	46.97	73.20	139.79	16.52	16.52
Approach Delay [s/veh]	70.61	16.54		21.28		
Approach LOS	F	C		C		
Intersection Delay [s/veh]	35.89					
Intersection LOS	E					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	78.8
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.753

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	103	4	254	0	0	0	114	236	0	0	282	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	0	0	0	0	0	8	4	0	0	2	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	108	4	254	0	0	0	122	240	0	0	284	241
Peak Hour Factor	0.9490	0.9490	0.9490	1.0000	1.0000	1.0000	0.9490	0.9490	1.0000	1.0000	0.9490	0.9490
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	1	67	0	0	0	32	63	0	0	75	63
Total Analysis Volume [veh/h]	114	4	268	0	0	0	129	253	0	0	299	254
Pedestrian Volume [ped/h]	146			0			0			0		

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Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.75	0.03	0.34	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	78.80	32.51	10.70	0.00	0.00	0.00	9.05	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	D	B				A	A			A	A
95th-Percentile Queue Length [veh]	4.61	0.73	0.68	0.00	0.00	0.00	0.43	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	115.17	18.23	16.90	0.00	0.00	0.00	10.85	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	31.03			0.00			3.06			0.00		
Approach LOS	D			A			A			A		
d_I, Intersection Delay [s/veh]	9.95											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	11.5
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	75	30	26	149	279	101	67	175	60	111	152	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	0	0	0	0	3	12	12	18	0	7	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	83	30	26	149	279	104	79	187	78	111	159	116
Peak Hour Factor	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	8	7	39	73	27	21	49	20	29	41	30
Total Analysis Volume [veh/h]	86	31	27	155	290	108	82	195	81	116	165	121
Pedestrian Volume [ped/h]	112			0			0			0		

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.92	1.24	1.03	1.03	0.62	0.58	1.65	0.47	0.89	1.30	0.76
95th-Percentile Queue Length [ft]	23.04	30.92	25.71	25.71	15.52	14.47	41.18	11.75	22.25	32.56	19.01
Approach Delay [s/veh]	10.79	11.35				11.95			11.68		
Approach LOS	B	B				B			B		
Intersection Delay [s/veh]	11.54										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset PM Existing + Open Door

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	8	2.0	0.193	4.6	LOS A	0.9	24.0	0.31	0.17	23.1
8	T1	9	2.0	0.193	4.6	LOS A	0.9	24.0	0.31	0.17	23.2
18	R2	218	2.0	0.193	4.6	LOS A	0.9	24.0	0.31	0.17	22.9
Approach		236	2.0	0.193	4.6	LOS A	0.9	24.0	0.31	0.17	22.9
East: Sunset Ave											
1	L2	210	2.0	0.261	4.8	LOS A	1.5	37.0	0.11	0.03	22.8
6	T1	116	2.0	0.261	4.8	LOS A	1.5	37.0	0.11	0.03	22.9
16	R2	34	2.0	0.261	4.8	LOS A	1.5	37.0	0.11	0.03	22.6
Approach		360	2.0	0.261	4.8	LOS A	1.5	37.0	0.11	0.03	22.8
North: Jay Street											
7	L2	34	2.0	0.046	4.0	LOS A	0.2	4.8	0.43	0.29	22.9
4	T1	10	2.0	0.046	4.0	LOS A	0.2	4.8	0.43	0.29	23.0
14	R2	2	2.0	0.046	4.0	LOS A	0.2	4.8	0.43	0.29	22.7
Approach		46	2.0	0.046	4.0	LOS A	0.2	4.8	0.43	0.29	22.9
West: Sunset Ave											
5	L2	1	2.0	0.102	4.2	LOS A	0.4	11.4	0.40	0.26	23.4
2	T1	99	2.0	0.102	4.2	LOS A	0.4	11.4	0.40	0.26	23.4
12	R2	11	2.0	0.102	4.2	LOS A	0.4	11.4	0.40	0.26	23.1
Approach		111	2.0	0.102	4.2	LOS A	0.4	11.4	0.40	0.26	23.4
All Vehicles		754	2.0	0.261	4.6	LOS A	1.5	37.0	0.24	0.13	22.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	26.7
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	13	354	113	100	322	6	5	16	12	109	20	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	8	5	0	0	0	0	0	19	0	12
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	354	121	105	322	6	5	16	12	128	20	136
Peak Hour Factor	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	96	33	29	88	2	1	4	3	35	5	37
Total Analysis Volume [veh/h]	14	386	132	114	351	7	5	17	13	139	22	148
Pedestrian Volume [ped/h]	24			18			18			10		

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	9.64	7.71	0.24	1.29	1.38
95th-Percentile Queue Length [ft]	241.02	192.71	6.10	32.14	34.46
Approach Delay [s/veh]	33.90	28.44	11.40	13.34	
Approach LOS	D	D	B	B	
Intersection Delay [s/veh]	26.69				
Intersection LOS	D				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	10.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	3	37	41	3	56	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	37	41	3	56	36
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	10	11	1	16	10
Total Analysis Volume [veh/h]	3	41	46	3	62	40
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.04	0.00	0.00	0.04	0.00
d_M, Delay for Movement [s/veh]	10.00	8.69	0.00	0.00	7.41	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.14	0.14	0.00	0.00	0.21	0.21
95th-Percentile Queue Length [ft]	3.46	3.46	0.00	0.00	5.25	5.25
d_A, Approach Delay [s/veh]	8.78		0.00		4.50	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.34					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	17.7
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.201

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	18	340	315	69	68	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	19	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	348	334	69	68	11
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	91	87	18	18	3
Total Analysis Volume [veh/h]	19	363	348	72	71	11
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.20	0.02
d_M, Delay for Movement [s/veh]	8.21	0.00	0.00	0.00	17.71	10.52
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	1.49	1.49	0.00	0.00	0.74	0.05
95th-Percentile Queue Length [ft]	37.25	37.25	0.00	0.00	18.45	1.26
d_A, Approach Delay [s/veh]	0.41		0.00		16.75	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	1.73					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	21.6
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name				K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name				K St			11th St			11th St		
Base Volume Input [veh/h]	96	283	37	54	233	7	21	104	84	52	121	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	0	0	19	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	96	291	37	54	252	7	21	104	84	52	121	46
Peak Hour Factor	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	77	10	14	67	2	6	28	22	14	32	12
Total Analysis Volume [veh/h]	102	310	39	58	268	7	22	111	89	55	129	49
Pedestrian Volume [ped/h]	17			18			5			12		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	7.62	4.11	2.13	2.35
95th-Percentile Queue Length [ft]	190.40	102.63	53.16	58.82
Approach Delay [s/veh]	29.47	19.54	15.05	15.80
Approach LOS	D	C	C	C
Intersection Delay [s/veh]	21.65			
Intersection LOS	C			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	14	14	8	7	0	0	7	2	13	8	16
Total Analysis Volume [veh/h]	4	54	54	32	27	1	1	28	8	52	32	64
Pedestrian Volume [ped/h]	4			3			3			7		

Intersection Settings

Priority Scheme	Free			Free			Stop			Stop		
Flared Lane							Yes			Yes		
Storage Area [veh]	0			0			1			1		
Two-Stage Gap Acceptance							No			No		
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.04	0.01	0.07	0.05	0.07
d_M, Delay for Movement [s/veh]	7.29	0.00	0.00	7.51	0.00	0.00	10.90	10.68	8.69	10.58	10.70	9.17
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.23	0.23	0.23	0.13	0.13	0.13	0.14	0.14	0.14	0.41	0.41	0.41
95th-Percentile Queue Length [ft]	5.73	5.73	5.73	3.20	3.20	3.20	3.46	3.46	3.46	10.36	10.36	10.36
d_A, Approach Delay [s/veh]	0.26			4.01			10.25			10.00		
Approach LOS	A			A			B			A		
d_I, Intersection Delay [s/veh]	5.96											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.013

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	11	26	9	3	28	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	26	9	3	28	10
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	7	3	1	8	3
Total Analysis Volume [veh/h]	12	29	10	3	31	11
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.03	0.00	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	9.15	8.52	0.00	0.00	7.29	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.13	0.13	0.00	0.00	0.08	0.08
95th-Percentile Queue Length [ft]	3.16	3.16	0.00	0.00	2.01	2.01
d_A, Approach Delay [s/veh]	8.70		0.00		5.38	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.07					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.012

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Peak Hour Factor	0.9140	1.0000	0.9140	0.9140	1.0000	0.9140	1.0000	0.9140	0.9140	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	1	50	0	2	0	2	27	0	0	0
Total Analysis Volume [veh/h]	5	0	5	201	0	7	0	9	108	0	0	0
Pedestrian Volume [ped/h]	0			0			9			9		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.10	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.23	0.00	9.41	0.00	0.00	0.00	0.00	10.37	8.83	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.38	0.38	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.55	0.00	0.55	0.00	0.00	0.00	0.00	9.60	9.60	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.82			0.00			8.95			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	3.42											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	11.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.153

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	87	27	89	19	8	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	87	27	89	19	8	181
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	7	23	5	2	47
Total Analysis Volume [veh/h]	91	28	93	20	8	189
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.15	0.02	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	11.82	9.67	7.44	0.00
Movement LOS	A	A	B	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.54	0.54	0.46	0.46
95th-Percentile Queue Length [ft]	0.00	0.00	13.49	13.49	11.43	11.43
d_A, Approach Delay [s/veh]	0.00		11.44		0.30	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	3.15					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	13.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	95	95	183	225	158	392
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	0	0	0	0	4
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	96	95	183	225	158	396
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	26	51	63	44	110
Total Analysis Volume [veh/h]	107	106	203	250	176	440
Pedestrian Volume [ped/h]	75		0		0	

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Version 4.00-02

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.19	1.82	2.15	1.51	1.59	1.59
95th-Percentile Queue Length [ft]	54.84	45.59	53.72	37.64	39.75	39.75
Approach Delay [s/veh]	16.03	13.66		12.09		
Approach LOS	C	B		B		
Intersection Delay [s/veh]	13.30					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	45.8
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.494

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	74	0	118	0	0	0	93	430	0	0	251	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	0	0	0	0	0	2	4	0	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	75	0	118	0	0	0	95	434	0	0	252	67
Peak Hour Factor	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	0	33	0	0	0	26	121	0	0	70	19
Total Analysis Volume [veh/h]	83	0	131	0	0	0	106	482	0	0	280	74
Pedestrian Volume [ped/h]	75			0			0			0		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.49	0.00	0.22	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	45.77	26.45	11.94	0.00	0.00	0.00	8.28	0.00	0.00	0.00	0.00	0.00
Movement LOS	E	D	B				A	A			A	A
95th-Percentile Queue Length [veh]	2.39	0.38	0.38	0.00	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	59.84	9.41	9.41	0.00	0.00	0.00	7.22	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	25.06			0.00			1.49			0.00		
Approach LOS	D			A			A			A		
d_I, Intersection Delay [s/veh]	5.40											
Intersection LOS	E											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	14.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	35	7	11	311	391	190	128	201	46	90	123	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	0	0	0	0	1	4	6	2	0	2	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	36	7	11	311	391	191	132	207	48	90	125	112
Peak Hour Factor	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	2	3	85	107	52	36	56	13	25	34	31
Total Analysis Volume [veh/h]	39	8	12	340	427	209	144	226	52	98	136	122
Pedestrian Volume [ped/h]	60			0			0			0		

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.31	4.63	1.77	1.77	1.46	1.24	2.23	0.30	0.78	1.11	0.85
95th-Percentile Queue Length [ft]	7.87	115.8	44.15	44.15	36.44	31.11	55.77	7.60	19.60	27.65	21.35
Approach Delay [s/veh]	9.43	15.57				13.88			12.12		
Approach LOS	A	C				B			B		
Intersection Delay [s/veh]	14.30										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6 Foster-Jay/Sunset AM Existing + Twin Parks

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	29	2.0	0.212	5.1	LOS A	1.0	26.1	0.40	0.27	23.0
8	T1	1	2.0	0.212	5.1	LOS A	1.0	26.1	0.40	0.27	23.0
18	R2	209	2.0	0.212	5.1	LOS A	1.0	26.1	0.40	0.27	22.7
Approach		239	2.0	0.212	5.1	LOS A	1.0	26.1	0.40	0.27	22.7
East: Sunset Ave											
1	L2	208	2.0	0.287	5.1	LOS A	1.6	41.8	0.15	0.05	22.8
6	T1	178	2.0	0.287	5.1	LOS A	1.6	41.8	0.15	0.05	22.9
16	R2	6	2.0	0.287	5.1	LOS A	1.6	41.8	0.15	0.05	22.6
Approach		391	2.0	0.287	5.1	LOS A	1.6	41.8	0.15	0.05	22.8
North: Jay Street											
7	L2	27	2.0	0.036	4.2	LOS A	0.1	3.7	0.47	0.34	22.8
4	T1	6	2.0	0.036	4.2	LOS A	0.1	3.7	0.47	0.34	22.9
14	R2	1	2.0	0.036	4.2	LOS A	0.1	3.7	0.47	0.34	22.6
Approach		33	2.0	0.036	4.2	LOS A	0.1	3.7	0.47	0.34	22.8
West: Sunset Ave											
5	L2	1	2.0	0.182	4.9	LOS A	0.9	21.8	0.41	0.29	23.2
2	T1	189	2.0	0.182	4.9	LOS A	0.9	21.8	0.41	0.29	23.3
12	R2	11	2.0	0.182	4.9	LOS A	0.9	21.8	0.41	0.29	23.0
Approach		201	2.0	0.182	4.9	LOS A	0.9	21.8	0.41	0.29	23.2
All Vehicles		864	2.0	0.287	5.0	LOS A	1.6	41.8	0.30	0.18	22.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	18.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	3	232	116	120	290	3	5	11	8	185	5	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	1	0	0	0	0	0	0	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	232	116	121	290	3	5	11	8	185	5	67
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	64	32	34	81	1	1	3	2	51	1	19
Total Analysis Volume [veh/h]	3	258	129	134	322	3	6	12	9	206	6	74
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.05	6.17	0.17	2.09	0.48
95th-Percentile Queue Length [ft]	101.22	154.14	4.21	52.23	12.00
Approach Delay [s/veh]	16.66	22.21	10.50	13.94	
Approach LOS	C	C	B	B	
Intersection Delay [s/veh]	18.04				
Intersection LOS	C				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	12.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	1	83	57	3	122	80
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	83	57	3	122	80
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	23	16	1	34	22
Total Analysis Volume [veh/h]	1	92	63	3	136	89
Pedestrian Volume [ped/h]	9		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.09	0.00	0.00	0.09	0.00
d_M, Delay for Movement [s/veh]	12.33	9.07	0.00	0.00	7.62	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.32	0.32	0.00	0.00	0.52	0.52
95th-Percentile Queue Length [ft]	7.92	7.92	0.00	0.00	13.08	13.08
d_A, Approach Delay [s/veh]	9.10		0.00		4.60	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.90					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	21.2
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.378

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	21	247	321	173	121	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	4	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	248	325	173	121	20
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	69	90	48	34	6
Total Analysis Volume [veh/h]	23	276	361	192	134	22
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.38	0.04
d_M, Delay for Movement [s/veh]	8.62	0.00	0.00	0.00	21.19	11.19
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	1.23	1.23	0.00	0.00	1.72	0.11
95th-Percentile Queue Length [ft]	30.80	30.80	0.00	0.00	42.90	2.83
d_A, Approach Delay [s/veh]	0.66		0.00		19.78	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	3.26					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	14.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	K St			K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	K St			K St			11th St			11th St		
Base Volume Input [veh/h]	109	143	16	37	182	6	38	153	112	32	73	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	4	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	109	144	16	37	186	6	38	153	112	32	73	27
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	40	4	10	52	2	11	43	31	9	20	8
Total Analysis Volume [veh/h]	121	160	18	41	207	7	42	170	124	36	81	30
Pedestrian Volume [ped/h]	9			9			6			6		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.76	2.13	3.19	1.01
95th-Percentile Queue Length [ft]	68.90	53.35	79.70	25.34
Approach Delay [s/veh]	14.72	13.47	15.19	11.42
Approach LOS	B	B	C	B
Intersection Delay [s/veh]	14.10			
Intersection LOS	B			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	12.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.008

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	16	15	18	17	1	1	6	2	14	5	13
Total Analysis Volume [veh/h]	2	62	60	70	68	2	4	26	7	58	20	50
Pedestrian Volume [ped/h]	5			5			4			4		

Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.05	0.00	0.00	0.01	0.05	0.01	0.10	0.04	0.05
d_M, Delay for Movement [s/veh]	7.37	0.00	0.00	7.60	0.00	0.00	12.08	11.91	9.01	11.96	11.97	9.42
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.27	0.27	0.27	0.32	0.32	0.32	0.17	0.17	0.17	0.48	0.48	0.48
95th-Percentile Queue Length [ft]	6.65	6.65	6.65	7.97	7.97	7.97	4.37	4.37	4.37	11.90	11.90	11.90
d_A, Approach Delay [s/veh]	0.12			3.80			11.38			10.97		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	5.53											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	4	53	5	3	75	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	53	5	3	75	5
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	15	1	1	21	1
Total Analysis Volume [veh/h]	4	59	6	3	83	6
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.05	0.00	0.00	0.05	0.00
d_M, Delay for Movement [s/veh]	9.91	8.57	0.00	0.00	7.36	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.19	0.19	0.00	0.00	0.18	0.18
95th-Percentile Queue Length [ft]	4.79	4.79	0.00	0.00	4.38	4.38
d_A, Approach Delay [s/veh]	8.65		0.00		6.86	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.18					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Peak Hour Factor	0.9340	1.0000	0.9340	0.9340	1.0000	0.9340	1.0000	0.9340	0.9340	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	0	6	37	0	3	0	2	42	0	0	0
Total Analysis Volume [veh/h]	24	0	22	148	0	11	0	9	167	0	0	0
Pedestrian Volume [ped/h]	0			0			11			11		

Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.16	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.97	0.00	9.22	0.00	0.00	0.00	0.00	10.30	9.10	0.00	0.00	0.00
Movement LOS	A		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.10	0.00	0.10	0.00	0.00	0.00	0.00	0.61	0.61	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	2.52	0.00	2.52	0.00	0.00	0.00	0.00	15.19	15.19	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.61			0.00			9.16			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	5.39											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	12.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.129

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	160	93	68	25	18	129
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	160	93	68	25	18	129
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	24	18	7	5	34
Total Analysis Volume [veh/h]	168	97	71	26	19	135
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.13	0.03	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	12.26	10.08	7.70	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.44	0.44	0.38	0.38
95th-Percentile Queue Length [ft]	0.00	0.00	11.06	11.06	9.61	9.61
d_A, Approach Delay [s/veh]	0.00		11.68		0.95	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	2.48					
Intersection LOS	B					

APPENDIX T.1

Generated with PTV VISTRO

Version 4.00-02

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	36.5
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	280	155	170	243	307	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	285	155	170	243	307	184
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	77	42	46	65	83	49
Total Analysis Volume [veh/h]	306	167	183	261	330	198
Pedestrian Volume [ped/h]	147		0		0	

Generated with PTV VISTRO

Version 4.00-02

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	13.63	1.88	2.93	5.59	0.66	0.66
95th-Percentile Queue Length [ft]	340.71	46.96	73.18	139.79	16.42	16.42
Approach Delay [s/veh]	72.23	16.54		21.30		
Approach LOS	F	C		C		
Intersection Delay [s/veh]	36.51					
Intersection LOS	E					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	73.9
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.732

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	103	4	254	0	0	0	114	236	0	0	282	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	0	0	0	0	0	1	3	0	0	5	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	108	4	254	0	0	0	115	239	0	0	287	241
Peak Hour Factor	0.9490	0.9490	0.9490	1.0000	1.0000	1.0000	0.9490	0.9490	1.0000	1.0000	0.9490	0.9490
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	1	67	0	0	0	30	63	0	0	76	63
Total Analysis Volume [veh/h]	114	4	268	0	0	0	121	252	0	0	302	254
Pedestrian Volume [ped/h]	146			0			0			0		

Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.73	0.03	0.34	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	73.87	31.78	10.68	0.00	0.00	0.00	9.03	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	D	B				A	A			A	A
95th-Percentile Queue Length [veh]	4.43	0.72	0.67	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	110.76	18.11	16.83	0.00	0.00	0.00	10.12	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	29.56			0.00			2.93			0.00		
Approach LOS	D			A			A			A		
d_I, Intersection Delay [s/veh]	9.51											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	11.5
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	75	30	26	149	279	101	67	175	60	111	152	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	0	0	0	0	3	3	4	1	0	10	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	78	30	26	149	279	104	70	179	61	111	162	116
Peak Hour Factor	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	8	7	39	73	27	18	47	16	29	42	30
Total Analysis Volume [veh/h]	81	31	27	155	290	108	73	186	63	116	169	121
Pedestrian Volume [ped/h]	112			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.90	1.23	1.02	1.02	0.61	0.51	1.53	0.35	0.89	1.34	0.76
95th-Percentile Queue Length [ft]	22.50	30.65	25.47	25.47	15.37	12.63	38.36	8.84	22.18	33.53	18.91
Approach Delay [s/veh]	10.88	11.27				11.82			11.70		
Approach LOS	B	B				B			B		
Intersection Delay [s/veh]	11.48										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset PM Existing + Twin Parks

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	8	2.0	0.164	4.3	LOS A	0.8	19.8	0.30	0.17	23.2
8	T1	9	2.0	0.164	4.3	LOS A	0.8	19.8	0.30	0.17	23.2
18	R2	183	2.0	0.164	4.3	LOS A	0.8	19.8	0.30	0.17	22.9
Approach		201	2.0	0.164	4.3	LOS A	0.8	19.8	0.30	0.17	23.0
East: Sunset Ave											
1	L2	208	2.0	0.259	4.8	LOS A	1.4	36.7	0.11	0.03	22.8
6	T1	116	2.0	0.259	4.8	LOS A	1.4	36.7	0.11	0.03	22.9
16	R2	34	2.0	0.259	4.8	LOS A	1.4	36.7	0.11	0.03	22.6
Approach		358	2.0	0.259	4.8	LOS A	1.4	36.7	0.11	0.03	22.8
North: Jay Street											
7	L2	34	2.0	0.046	4.0	LOS A	0.2	4.8	0.43	0.29	22.9
4	T1	10	2.0	0.046	4.0	LOS A	0.2	4.8	0.43	0.29	23.0
14	R2	2	2.0	0.046	4.0	LOS A	0.2	4.8	0.43	0.29	22.7
Approach		46	2.0	0.046	4.0	LOS A	0.2	4.8	0.43	0.29	22.9
West: Sunset Ave											
5	L2	1	2.0	0.102	4.2	LOS A	0.4	11.3	0.40	0.26	23.4
2	T1	99	2.0	0.102	4.2	LOS A	0.4	11.3	0.40	0.26	23.4
12	R2	11	2.0	0.102	4.2	LOS A	0.4	11.3	0.40	0.26	23.1
Approach		111	2.0	0.102	4.2	LOS A	0.4	11.3	0.40	0.26	23.4
All Vehicles		717	2.0	0.259	4.5	LOS A	1.4	36.7	0.23	0.12	23.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	24.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	13	354	113	100	322	6	5	16	12	109	20	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	5	0	0	0	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	354	113	105	322	6	5	16	12	109	20	127
Peak Hour Factor	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	96	31	29	88	2	1	4	3	30	5	35
Total Analysis Volume [veh/h]	14	386	123	114	351	7	5	17	13	119	22	138
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	8.68	7.25	0.24	1.03	1.25
95th-Percentile Queue Length [ft]	217.12	181.37	5.92	25.73	31.19
Approach Delay [s/veh]	29.75	26.27	11.15	12.72	
Approach LOS	D	D	B	B	
Intersection Delay [s/veh]	24.37				
Intersection LOS	C				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	10.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	3	37	41	3	56	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	37	41	3	56	36
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	10	11	1	16	10
Total Analysis Volume [veh/h]	3	41	46	3	62	40
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.04	0.00	0.00	0.04	0.00
d_M, Delay for Movement [s/veh]	10.00	8.69	0.00	0.00	7.41	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.14	0.14	0.00	0.00	0.21	0.21
95th-Percentile Queue Length [ft]	3.46	3.46	0.00	0.00	5.25	5.25
d_A, Approach Delay [s/veh]	8.78		0.00		4.50	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.34					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	17.3
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.195

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	18	340	315	69	68	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	5	3	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	345	318	69	68	11
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	90	83	18	18	3
Total Analysis Volume [veh/h]	19	359	331	72	71	11
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.19	0.02
d_M, Delay for Movement [s/veh]	8.17	0.00	0.00	0.00	17.27	10.39
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	1.44	1.44	0.00	0.00	0.71	0.05
95th-Percentile Queue Length [ft]	35.92	35.92	0.00	0.00	17.82	1.24
d_A, Approach Delay [s/veh]	0.41		0.00		16.34	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	1.73					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	20.6
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name				K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name				K St			11th St			11th St		
Base Volume Input [veh/h]	96	283	37	54	233	7	21	104	84	52	121	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	5	0	0	3	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	96	288	37	54	236	7	21	104	84	52	121	46
Peak Hour Factor	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	77	10	14	63	2	6	28	22	14	32	12
Total Analysis Volume [veh/h]	102	307	39	58	251	7	22	111	89	55	129	49
Pedestrian Volume [ped/h]	17			18			5			12		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	7.28	3.64	2.08	2.30
95th-Percentile Queue Length [ft]	181.93	91.00	51.89	57.42
Approach Delay [s/veh]	27.94	18.17	14.74	15.47
Approach LOS	D	C	B	C
Intersection Delay [s/veh]	20.62			
Intersection LOS	C			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	14	14	8	7	0	0	7	2	13	8	16
Total Analysis Volume [veh/h]	4	54	54	32	27	1	1	28	8	52	32	64
Pedestrian Volume [ped/h]	4			3			3			7		

Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.04	0.01	0.07	0.05	0.07
d_M, Delay for Movement [s/veh]	7.29	0.00	0.00	7.51	0.00	0.00	10.90	10.68	8.69	10.58	10.70	9.17
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.23	0.23	0.23	0.13	0.13	0.13	0.14	0.14	0.14	0.41	0.41	0.41
95th-Percentile Queue Length [ft]	5.73	5.73	5.73	3.20	3.20	3.20	3.46	3.46	3.46	10.36	10.36	10.36
d_A, Approach Delay [s/veh]	0.26			4.01			10.25			10.00		
Approach LOS	A			A			B			A		
d_I, Intersection Delay [s/veh]	5.96											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.013

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	11	26	9	3	28	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	26	9	3	28	10
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	7	3	1	8	3
Total Analysis Volume [veh/h]	12	29	10	3	31	11
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.03	0.00	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	9.15	8.52	0.00	0.00	7.29	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.13	0.13	0.00	0.00	0.08	0.08
95th-Percentile Queue Length [ft]	3.16	3.16	0.00	0.00	2.01	2.01
d_A, Approach Delay [s/veh]	8.70		0.00		5.38	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.07					
Intersection LOS	A					

APPENDIX T.1

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Version 4.00-02

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.012

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Peak Hour Factor	0.9140	1.0000	0.9140	0.9140	1.0000	0.9140	1.0000	0.9140	0.9140	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	1	50	0	2	0	2	27	0	0	0
Total Analysis Volume [veh/h]	5	0	5	201	0	7	0	9	108	0	0	0
Pedestrian Volume [ped/h]	0			0			9			9		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.10	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.23	0.00	9.41	0.00	0.00	0.00	0.00	10.37	8.83	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.38	0.38	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.55	0.00	0.55	0.00	0.00	0.00	0.00	9.60	9.60	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.82			0.00			8.95			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	3.42											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	11.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.153

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	87	27	89	19	8	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	87	27	89	19	8	181
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	7	23	5	2	47
Total Analysis Volume [veh/h]	91	28	93	20	8	189
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.15	0.02	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	11.82	9.67	7.44	0.00
Movement LOS	A	A	B	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.54	0.54	0.46	0.46
95th-Percentile Queue Length [ft]	0.00	0.00	13.49	13.49	11.43	11.43
d_A, Approach Delay [s/veh]	0.00		11.44		0.30	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	3.15					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	13.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	95	95	183	225	158	392
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	96	95	183	225	158	395
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	26	51	63	44	110
Total Analysis Volume [veh/h]	107	106	203	250	176	439
Pedestrian Volume [ped/h]	75		0		0	

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.19	1.82	2.15	1.51	1.58	1.58
95th-Percentile Queue Length [ft]	54.82	45.57	53.69	37.63	39.61	39.61
Approach Delay [s/veh]	16.02	13.66		12.08		
Approach LOS	C	B		B		
Intersection Delay [s/veh]	13.29					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	46.4
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.495

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	74	0	118	0	0	0	93	430	0	0	251	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	6	3	0	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	74	0	118	0	0	0	99	433	0	0	252	67
Peak Hour Factor	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	0	33	0	0	0	28	120	0	0	70	19
Total Analysis Volume [veh/h]	82	0	131	0	0	0	110	481	0	0	280	74
Pedestrian Volume [ped/h]	75			0			0			0		

Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.50	0.00	0.22	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	46.37	26.72	11.93	0.00	0.00	0.00	8.29	0.00	0.00	0.00	0.00	0.00
Movement LOS	E	D	B				A	A			A	A
95th-Percentile Queue Length [veh]	2.39	0.38	0.38	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	59.86	9.40	9.40	0.00	0.00	0.00	7.52	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	25.19			0.00			1.54			0.00		
Approach LOS	D			A			A			A		
d_I, Intersection Delay [s/veh]	5.42											
Intersection LOS	E											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	14.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	35	7	11	311	391	190	128	201	46	90	123	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	3	0	9	0	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	7	11	311	391	193	128	210	46	90	124	112
Peak Hour Factor	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	2	3	85	107	53	35	57	13	25	34	31
Total Analysis Volume [veh/h]	38	8	12	340	427	211	140	229	50	98	135	122
Pedestrian Volume [ped/h]	60			0			0			0		

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Version 4.00-02

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.31	4.63	1.76	1.76	1.48	1.20	2.28	0.29	0.79	1.10	0.86
95th-Percentile Queue Length [ft]	7.76	115.6	44.11	44.11	36.91	29.93	56.99	7.28	19.63	27.42	21.38
Approach Delay [s/veh]	9.45	15.55				13.93			12.12		
Approach LOS	A	C				B			B		
Intersection Delay [s/veh]	14.31										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6 Foster-Jay/Sunset AM Existing + Creekside

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	29	2.0	0.209	5.1	LOS A	1.0	25.7	0.40	0.27	23.0
8	T1	1	2.0	0.209	5.1	LOS A	1.0	25.7	0.40	0.27	23.0
18	R2	206	2.0	0.209	5.1	LOS A	1.0	25.7	0.40	0.27	22.7
Approach		236	2.0	0.209	5.1	LOS A	1.0	25.7	0.40	0.27	22.8
East: Sunset Ave											
1	L2	208	2.0	0.287	5.1	LOS A	1.6	41.8	0.15	0.05	22.8
6	T1	178	2.0	0.287	5.1	LOS A	1.6	41.8	0.15	0.05	22.9
16	R2	6	2.0	0.287	5.1	LOS A	1.6	41.8	0.15	0.05	22.6
Approach		391	2.0	0.287	5.1	LOS A	1.6	41.8	0.15	0.05	22.8
North: Jay Street											
7	L2	27	2.0	0.036	4.2	LOS A	0.1	3.7	0.47	0.34	22.8
4	T1	6	2.0	0.036	4.2	LOS A	0.1	3.7	0.47	0.34	22.9
14	R2	1	2.0	0.036	4.2	LOS A	0.1	3.7	0.47	0.34	22.6
Approach		33	2.0	0.036	4.2	LOS A	0.1	3.7	0.47	0.34	22.8
West: Sunset Ave											
5	L2	1	2.0	0.182	4.9	LOS A	0.9	21.8	0.41	0.29	23.2
2	T1	189	2.0	0.182	4.9	LOS A	0.9	21.8	0.41	0.29	23.3
12	R2	11	2.0	0.182	4.9	LOS A	0.9	21.8	0.41	0.29	23.0
Approach		201	2.0	0.182	4.9	LOS A	0.9	21.8	0.41	0.29	23.2
All Vehicles		861	2.0	0.287	5.0	LOS A	1.6	41.8	0.30	0.18	22.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	19.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	3	232	116	120	290	3	5	11	8	185	5	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	11	9	0	5	0	0	0	0	4	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	243	125	120	295	3	5	11	8	189	5	65
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	68	35	33	82	1	1	3	2	53	1	18
Total Analysis Volume [veh/h]	3	270	139	133	328	3	6	12	9	210	6	72
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.63	6.51	0.17	2.19	0.47
95th-Percentile Queue Length [ft]	115.69	162.75	4.29	54.85	11.84
Approach Delay [s/veh]	18.09	23.41	10.64	14.33	
Approach LOS	C	C	B	B	
Intersection Delay [s/veh]	19.08				
Intersection LOS	C				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	13.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	1	83	57	3	122	80
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	52	0	0	25
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	83	109	3	122	105
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	23	30	1	34	29
Total Analysis Volume [veh/h]	1	92	121	3	136	117
Pedestrian Volume [ped/h]	9		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.10	0.00	0.00	0.09	0.00
d_M, Delay for Movement [s/veh]	13.29	9.42	0.00	0.00	7.76	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.34	0.34	0.00	0.00	0.64	0.64
95th-Percentile Queue Length [ft]	8.61	8.61	0.00	0.00	15.93	15.93
d_A, Approach Delay [s/veh]	9.46		0.00		4.17	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.12					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	25.3
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.475

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	21	247	321	173	121	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	0	0	9	20	32
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	37	247	321	182	141	52
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	69	89	51	39	14
Total Analysis Volume [veh/h]	41	274	357	202	157	58
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.00	0.00	0.47	0.10
d_M, Delay for Movement [s/veh]	8.71	0.00	0.00	0.00	25.35	11.61
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh]	1.34	1.34	0.00	0.00	2.44	0.32
95th-Percentile Queue Length [ft]	33.39	33.39	0.00	0.00	60.95	7.95
d_A, Approach Delay [s/veh]	1.13		0.00		21.64	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	4.60					
Intersection LOS	D					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	15.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	K St			K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	K St			K St			11th St			11th St		
Base Volume Input [veh/h]	109	143	16	37	182	6	38	153	112	32	73	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	13	0	6	26	0	0	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	109	156	16	43	208	6	38	153	112	32	73	30
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	43	4	12	58	2	11	43	31	9	20	8
Total Analysis Volume [veh/h]	121	173	18	48	231	7	42	170	124	36	81	33
Pedestrian Volume [ped/h]	9			9			6			6		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.11	2.67	3.39	1.09
95th-Percentile Queue Length [ft]	77.64	66.83	84.70	27.18
Approach Delay [s/veh]	15.81	14.87	16.06	11.87
Approach LOS	C	B	C	B
Intersection Delay [s/veh]	15.09			
Intersection LOS	C			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	12.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.008

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	3	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	57	54	63	64	2	4	23	6	52	18	45
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	16	15	18	18	1	1	6	2	14	5	13
Total Analysis Volume [veh/h]	2	63	60	70	71	2	4	26	7	58	20	50
Pedestrian Volume [ped/h]	5			5			4			4		

Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.05	0.00	0.00	0.01	0.05	0.01	0.10	0.04	0.05
d_M, Delay for Movement [s/veh]	7.38	0.00	0.00	7.60	0.00	0.00	12.13	11.95	9.03	12.01	12.02	9.43
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.27	0.27	0.27	0.33	0.33	0.33	0.18	0.18	0.18	0.48	0.48	0.48
95th-Percentile Queue Length [ft]	6.73	6.73	6.73	8.17	8.17	8.17	4.40	4.40	4.40	11.98	11.98	11.98
d_A, Approach Delay [s/veh]	0.12			3.72			11.42			11.00		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	5.49											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	10.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	4	53	5	3	75	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	54	5	3	78	5
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	15	1	1	22	1
Total Analysis Volume [veh/h]	4	60	6	3	87	6
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.06	0.00	0.00	0.05	0.00
d_M, Delay for Movement [s/veh]	9.97	8.57	0.00	0.00	7.36	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.19	0.19	0.00	0.00	0.18	0.18
95th-Percentile Queue Length [ft]	4.87	4.87	0.00	0.00	4.59	4.59
d_A, Approach Delay [s/veh]	8.66		0.00		6.89	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.20					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 13: Foster Ave/ Project Driveway

Control Type:	Two-way stop	Delay (sec / veh):	9.6
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.062

Intersection Setup

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	0	0	0	58	81	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	52	3	1	0	0	25
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	3	1	58	81	25
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	1	0	15	20	6
Total Analysis Volume [veh/h]	52	3	1	58	81	25
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.60	9.03	7.43	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.21	0.21	0.12	0.12	0.00	0.00
95th-Percentile Queue Length [ft]	5.22	5.22	3.10	3.10	0.00	0.00
d_A, Approach Delay [s/veh]	9.57		0.13		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.43					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Peak Hour Factor	0.9340	1.0000	0.9340	0.9340	1.0000	0.9340	1.0000	0.9340	0.9340	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	0	6	37	0	3	0	2	42	0	0	0
Total Analysis Volume [veh/h]	24	0	22	148	0	11	0	9	167	0	0	0
Pedestrian Volume [ped/h]	0			0			11			11		

Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.16	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.97	0.00	9.22	0.00	0.00	0.00	0.00	10.30	9.10	0.00	0.00	0.00
Movement LOS	A		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.10	0.00	0.10	0.00	0.00	0.00	0.00	0.61	0.61	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	2.52	0.00	2.52	0.00	0.00	0.00	0.00	15.19	15.19	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.61			0.00			9.16			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	5.39											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	12.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.129

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	160	93	68	25	18	129
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	160	93	68	25	18	129
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	24	18	7	5	34
Total Analysis Volume [veh/h]	168	97	71	26	19	135
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.13	0.03	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	12.26	10.08	7.70	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.44	0.44	0.38	0.38
95th-Percentile Queue Length [ft]	0.00	0.00	11.06	11.06	9.61	9.61
d_A, Approach Delay [s/veh]	0.00		11.68		0.95	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	2.48					
Intersection LOS	B					

APPENDIX T.1

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Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	36.1
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	280	155	170	243	307	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	0	0	0	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	283	155	170	243	307	183
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	76	42	46	65	83	49
Total Analysis Volume [veh/h]	304	167	183	261	330	197
Pedestrian Volume [ped/h]	147		0		0	

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	13.46	1.88	2.93	5.59	0.65	0.65
95th-Percentile Queue Length [ft]	336.55	46.94	73.14	139.78	16.32	16.32
Approach Delay [s/veh]	71.00	16.53		21.31		
Approach LOS	F	C		C		
Intersection Delay [s/veh]	36.07					
Intersection LOS	E					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	70.5
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.705

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	103	4	254	0	0	0	114	236	0	0	282	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	4	2	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	103	4	254	0	0	0	118	238	0	0	285	241
Peak Hour Factor	0.9490	0.9490	0.9490	1.0000	1.0000	1.0000	0.9490	0.9490	1.0000	1.0000	0.9490	0.9490
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	1	67	0	0	0	31	63	0	0	75	63
Total Analysis Volume [veh/h]	109	4	268	0	0	0	124	251	0	0	300	254
Pedestrian Volume [ped/h]	146			0			0			0		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.70	0.03	0.34	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	70.46	31.96	10.67	0.00	0.00	0.00	9.03	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	D	B				A	A			A	A
95th-Percentile Queue Length [veh]	4.15	0.72	0.67	0.00	0.00	0.00	0.42	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	103.69	18.11	16.82	0.00	0.00	0.00	10.38	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	28.00			0.00			2.99			0.00		
Approach LOS	D			A			A			A		
d_I, Intersection Delay [s/veh]	9.00											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	11.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	75	30	26	149	279	101	67	175	60	111	152	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	7	0	6	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	75	30	26	149	279	108	67	181	60	111	155	116
Peak Hour Factor	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	8	7	39	73	28	17	47	16	29	40	30
Total Analysis Volume [veh/h]	78	31	27	155	290	112	70	188	62	116	161	121
Pedestrian Volume [ped/h]	112			0			0			0		

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Version 4.00-02

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.88	1.22	1.01	1.01	0.64	0.48	1.55	0.35	0.89	1.25	0.76
95th-Percentile Queue Length [ft]	21.91	30.52	25.36	25.36	15.98	11.99	38.81	8.65	22.16	31.31	18.89
Approach Delay [s/veh]	10.84	11.23				11.82			11.59		
Approach LOS	B	B				B			B		
Intersection Delay [s/veh]	11.43										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset PM Existing + Creekside

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	8	2.0	0.163	4.3	LOS A	0.8	19.6	0.30	0.17	23.2
8	T1	9	2.0	0.163	4.3	LOS A	0.8	19.6	0.30	0.17	23.2
18	R2	181	2.0	0.163	4.3	LOS A	0.8	19.6	0.30	0.17	23.0
Approach		199	2.0	0.163	4.3	LOS A	0.8	19.6	0.30	0.17	23.0
East: Sunset Ave											
1	L2	202	2.0	0.255	4.8	LOS A	1.4	35.9	0.11	0.03	22.9
6	T1	116	2.0	0.255	4.8	LOS A	1.4	35.9	0.11	0.03	22.9
16	R2	34	2.0	0.255	4.8	LOS A	1.4	35.9	0.11	0.03	22.6
Approach		352	2.0	0.255	4.8	LOS A	1.4	35.9	0.11	0.03	22.8
North: Jay Street											
7	L2	34	2.0	0.046	4.0	LOS A	0.2	4.8	0.43	0.29	22.9
4	T1	10	2.0	0.046	4.0	LOS A	0.2	4.8	0.43	0.29	23.0
14	R2	2	2.0	0.046	4.0	LOS A	0.2	4.8	0.43	0.29	22.7
Approach		46	2.0	0.046	4.0	LOS A	0.2	4.8	0.43	0.29	22.9
West: Sunset Ave											
5	L2	1	2.0	0.102	4.2	LOS A	0.4	11.3	0.39	0.26	23.4
2	T1	99	2.0	0.102	4.2	LOS A	0.4	11.3	0.39	0.26	23.4
12	R2	11	2.0	0.102	4.2	LOS A	0.4	11.3	0.39	0.26	23.1
Approach		111	2.0	0.102	4.2	LOS A	0.4	11.3	0.39	0.26	23.4
All Vehicles		709	2.0	0.255	4.5	LOS A	1.4	35.9	0.23	0.12	23.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	27.2
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	13	354	113	100	322	6	5	16	12	109	20	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	10	6	0	13	0	0	0	0	10	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	364	119	100	335	6	5	16	12	119	20	124
Peak Hour Factor	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	99	32	27	91	2	1	4	3	32	5	34
Total Analysis Volume [veh/h]	14	397	130	109	365	7	5	17	13	130	22	135
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	9.87	7.90	0.24	1.18	1.24
95th-Percentile Queue Length [ft]	246.81	197.56	6.06	29.42	30.99
Approach Delay [s/veh]	34.41	28.78	11.35	13.06	
Approach LOS	D	D	B	B	
Intersection Delay [s/veh]	27.24				
Intersection LOS	D				

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Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	3	37	41	3	56	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	43	0	0	64
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	37	84	3	56	100
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	10	23	1	16	28
Total Analysis Volume [veh/h]	3	41	93	3	62	111
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.04	0.00	0.00	0.04	0.00
d_M, Delay for Movement [s/veh]	10.86	8.93	0.00	0.00	7.51	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.15	0.15	0.00	0.00	0.39	0.39
95th-Percentile Queue Length [ft]	3.72	3.72	0.00	0.00	9.77	9.77
d_A, Approach Delay [s/veh]	9.06		0.00		2.69	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.76					
Intersection LOS	B					

APPENDIX T.1

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Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	21.3
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.286

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	18	340	315	69	68	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	41	0	0	23	16	27
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	59	340	315	92	84	38
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	89	82	24	22	10
Total Analysis Volume [veh/h]	61	354	328	96	88	40
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.00	0.00	0.00	0.29	0.06
d_M, Delay for Movement [s/veh]	8.35	0.00	0.00	0.00	21.33	10.71
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	1.70	1.70	0.00	0.00	1.15	0.19
95th-Percentile Queue Length [ft]	42.41	42.41	0.00	0.00	28.85	4.75
d_A, Approach Delay [s/veh]	1.23		0.00		18.01	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	2.91					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	26.1
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes		

Intersection Setup

Name				K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name				K St			11th St			11th St		
Base Volume Input [veh/h]	96	283	37	54	233	7	21	104	84	52	121	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	33	0	5	22	0	0	0	0	0	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	96	316	37	59	255	7	21	104	84	52	121	54
Peak Hour Factor	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	84	10	16	68	2	6	28	22	14	32	14
Total Analysis Volume [veh/h]	102	337	39	63	272	7	22	111	89	55	129	58
Pedestrian Volume [ped/h]	17			18			5			12		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	9.58	4.68	2.28	2.66
95th-Percentile Queue Length [ft]	239.50	117.08	57.01	66.61
Approach Delay [s/veh]	38.36	21.90	16.01	17.13
Approach LOS	E	C	C	C
Intersection Delay [s/veh]	26.11			
Intersection LOS	D			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	11.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	0	0	2	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	52	49	29	26	1	1	25	7	47	29	58
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	14	14	8	7	0	0	7	2	13	8	16
Total Analysis Volume [veh/h]	4	58	54	32	29	1	1	28	8	52	32	64
Pedestrian Volume [ped/h]	4			3			3			7		

Intersection Settings

Priority Scheme	Free			Free			Stop			Stop		
Flared Lane							Yes			Yes		
Storage Area [veh]	0			0			1			1		
Two-Stage Gap Acceptance							No			No		
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.04	0.01	0.08	0.05	0.07
d_M, Delay for Movement [s/veh]	7.29	0.00	0.00	7.52	0.00	0.00	10.95	10.72	8.70	10.63	10.75	9.20
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.24	0.24	0.24	0.13	0.13	0.13	0.14	0.14	0.14	0.42	0.42	0.42
95th-Percentile Queue Length [ft]	5.96	5.96	5.96	3.33	3.33	3.33	3.49	3.49	3.49	10.46	10.46	10.46
d_A, Approach Delay [s/veh]	0.25			3.88			10.29			10.04		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	5.88											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.013

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	11	26	9	3	28	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	0	0	2	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	29	9	3	30	10
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	8	3	1	8	3
Total Analysis Volume [veh/h]	12	32	10	3	33	11
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.03	0.00	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	9.19	8.53	0.00	0.00	7.29	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.14	0.14	0.00	0.00	0.08	0.08
95th-Percentile Queue Length [ft]	3.40	3.40	0.00	0.00	2.11	2.11
d_A, Approach Delay [s/veh]	8.71		0.00		5.47	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.18					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 13: Foster Avenue/ Creekside Prj Driveway

Control Type:	Two-way stop	Delay (sec / veh):	8.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.044

Intersection Setup

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	0	0	0	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	43	2	3	0	0	64
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	43	2	3	0	0	64
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	1	1	0	0	16
Total Analysis Volume [veh/h]	43	2	3	0	0	64
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	8.88	8.63	7.34	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.14	0.14	0.01	0.01	0.00	0.00
95th-Percentile Queue Length [ft]	3.62	3.62	0.15	0.15	0.00	0.00
d_A, Approach Delay [s/veh]	8.87		7.34		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.76					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.012

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Peak Hour Factor	0.9140	1.0000	0.9140	0.9140	1.0000	0.9140	1.0000	0.9140	0.9140	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	1	50	0	2	0	2	27	0	0	0
Total Analysis Volume [veh/h]	5	0	5	201	0	7	0	9	108	0	0	0
Pedestrian Volume [ped/h]	0			0			9			9		

Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.10	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.23	0.00	9.41	0.00	0.00	0.00	0.00	10.37	8.83	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.38	0.38	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.55	0.00	0.55	0.00	0.00	0.00	0.00	9.60	9.60	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.82			0.00			8.95			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	3.42											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	11.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.153

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	87	27	89	19	8	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	87	27	89	19	8	181
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	23	7	23	5	2	47
Total Analysis Volume [veh/h]	91	28	93	20	8	189
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.15	0.02	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	11.82	9.67	7.44	0.00
Movement LOS	A	A	B	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.54	0.54	0.46	0.46
95th-Percentile Queue Length [ft]	0.00	0.00	13.49	13.49	11.43	11.43
d_A, Approach Delay [s/veh]	0.00		11.44		0.30	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	3.15					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	13.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	95	95	183	225	158	392
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	96	95	183	225	158	395
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	26	51	63	44	110
Total Analysis Volume [veh/h]	107	106	203	250	176	439
Pedestrian Volume [ped/h]	75		0		0	

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.19	1.82	2.15	1.51	1.58	1.58
95th-Percentile Queue Length [ft]	54.82	45.57	53.69	37.63	39.61	39.61
Approach Delay [s/veh]	16.02	13.66		12.08		
Approach LOS	C	B		B		
Intersection Delay [s/veh]	13.29					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	46.4
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.495

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	74	0	118	0	0	0	93	430	0	0	251	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	6	3	0	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	74	0	118	0	0	0	99	433	0	0	252	67
Peak Hour Factor	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	21	0	33	0	0	0	28	120	0	0	70	19
Total Analysis Volume [veh/h]	82	0	131	0	0	0	110	481	0	0	280	74
Pedestrian Volume [ped/h]	75			0			0			0		

Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.50	0.00	0.22	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	46.37	26.72	11.93	0.00	0.00	0.00	8.29	0.00	0.00	0.00	0.00	0.00
Movement LOS	E	D	B				A	A			A	A
95th-Percentile Queue Length [veh]	2.39	0.38	0.38	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	59.86	9.40	9.40	0.00	0.00	0.00	7.52	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	25.19			0.00			1.54			0.00		
Approach LOS	D			A			A			A		
d_I, Intersection Delay [s/veh]	5.42											
Intersection LOS	E											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	14.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	35	7	11	311	391	190	128	201	46	90	123	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	3	0	9	0	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	35	7	11	311	391	193	128	210	46	90	124	112
Peak Hour Factor	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	2	3	85	107	53	35	57	13	25	34	31
Total Analysis Volume [veh/h]	38	8	12	340	427	211	140	229	50	98	135	122
Pedestrian Volume [ped/h]	60			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.31	4.63	1.76	1.76	1.48	1.20	2.28	0.29	0.79	1.10	0.86
95th-Percentile Queue Length [ft]	7.76	115.6	44.11	44.11	36.91	29.93	56.99	7.28	19.63	27.42	21.38
Approach Delay [s/veh]	9.45	15.55				13.93			12.12		
Approach LOS	A	C				B			B		
Intersection Delay [s/veh]	14.31										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6 Foster-Jay/Sunset AM Existing + Creekside

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	29	2.0	0.209	5.1	LOS A	1.0	25.7	0.40	0.27	23.0
8	T1	1	2.0	0.209	5.1	LOS A	1.0	25.7	0.40	0.27	23.0
18	R2	206	2.0	0.209	5.1	LOS A	1.0	25.7	0.40	0.27	22.7
Approach		236	2.0	0.209	5.1	LOS A	1.0	25.7	0.40	0.27	22.8
East: Sunset Ave											
1	L2	208	2.0	0.287	5.1	LOS A	1.6	41.8	0.15	0.05	22.8
6	T1	178	2.0	0.287	5.1	LOS A	1.6	41.8	0.15	0.05	22.9
16	R2	6	2.0	0.287	5.1	LOS A	1.6	41.8	0.15	0.05	22.6
Approach		391	2.0	0.287	5.1	LOS A	1.6	41.8	0.15	0.05	22.8
North: Jay Street											
7	L2	27	2.0	0.036	4.2	LOS A	0.1	3.7	0.47	0.34	22.8
4	T1	6	2.0	0.036	4.2	LOS A	0.1	3.7	0.47	0.34	22.9
14	R2	1	2.0	0.036	4.2	LOS A	0.1	3.7	0.47	0.34	22.6
Approach		33	2.0	0.036	4.2	LOS A	0.1	3.7	0.47	0.34	22.8
West: Sunset Ave											
5	L2	1	2.0	0.182	4.9	LOS A	0.9	21.8	0.41	0.29	23.2
2	T1	189	2.0	0.182	4.9	LOS A	0.9	21.8	0.41	0.29	23.3
12	R2	11	2.0	0.182	4.9	LOS A	0.9	21.8	0.41	0.29	23.0
Approach		201	2.0	0.182	4.9	LOS A	0.9	21.8	0.41	0.29	23.2
All Vehicles		861	2.0	0.287	5.0	LOS A	1.6	41.8	0.30	0.18	22.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	21.7
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd						Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd						Foster Ave		
Base Volume Input [veh/h]	11	201	101	120	251	43	36	26	16	159	31	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	21	0	0	0	2	3	11	9	32	3	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	201	101	120	253	46	47	35	48	162	32	65
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	56	28	33	70	13	13	10	13	45	9	18
Total Analysis Volume [veh/h]	36	223	112	133	281	51	52	39	53	180	36	72
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.67	7.94	1.22	1.90	0.79
95th-Percentile Queue Length [ft]	116.68	198.47	30.57	47.46	19.70
Approach Delay [s/veh]	20.15	30.11	13.45	14.32	
Approach LOS	C	D	B	B	
Intersection Delay [s/veh]	21.72				
Intersection LOS	C				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	11.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	1	83	3	3	122	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	83	3	3	122	3
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	23	1	1	34	1
Total Analysis Volume [veh/h]	1	92	3	3	136	3
Pedestrian Volume [ped/h]	9		0		0	

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.09	0.00	0.00	0.09	0.00
d_M, Delay for Movement [s/veh]	10.99	8.74	0.00	0.00	7.48	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.29	0.29	0.00	0.00	0.29	0.29
95th-Percentile Queue Length [ft]	7.27	7.27	0.00	0.00	7.18	7.18
d_A, Approach Delay [s/veh]	8.76		0.00		7.32	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.70					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	17.8
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.229

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	13	247	321	104	75	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	16	32	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	263	353	104	75	12
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	73	98	29	21	3
Total Analysis Volume [veh/h]	14	292	392	116	83	13
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.23	0.02
d_M, Delay for Movement [s/veh]	8.45	0.00	0.00	0.00	17.84	11.04
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	1.21	1.21	0.00	0.00	0.87	0.07
95th-Percentile Queue Length [ft]	30.17	30.17	0.00	0.00	21.70	1.63
d_A, Approach Delay [s/veh]	0.39		0.00		16.91	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	1.91					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	15.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	K St			K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	K St			K St			11th St			11th St		
Base Volume Input [veh/h]	109	143	16	37	182	6	38	153	112	32	73	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	13	0	6	26	0	0	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	109	156	16	43	208	6	38	153	112	32	73	30
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	43	4	12	58	2	11	43	31	9	20	8
Total Analysis Volume [veh/h]	121	173	18	48	231	7	42	170	124	36	81	33
Pedestrian Volume [ped/h]	9			9			6			6		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.11	2.67	3.39	1.09
95th-Percentile Queue Length [ft]	77.64	66.83	84.70	27.18
Approach Delay [s/veh]	15.81	14.87	16.06	11.87
Approach LOS	C	B	C	B
Intersection Delay [s/veh]	15.09			
Intersection LOS	C			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	12.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.008

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	3	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	57	54	63	64	2	4	23	6	52	18	45
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	16	15	18	18	1	1	6	2	14	5	13
Total Analysis Volume [veh/h]	2	63	60	70	71	2	4	26	7	58	20	50
Pedestrian Volume [ped/h]	5			5			4			4		

Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.05	0.00	0.00	0.01	0.05	0.01	0.10	0.04	0.05
d_M, Delay for Movement [s/veh]	7.38	0.00	0.00	7.60	0.00	0.00	12.13	11.95	9.03	12.01	12.02	9.43
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.27	0.27	0.27	0.33	0.33	0.33	0.18	0.18	0.18	0.48	0.48	0.48
95th-Percentile Queue Length [ft]	6.73	6.73	6.73	8.17	8.17	8.17	4.40	4.40	4.40	11.98	11.98	11.98
d_A, Approach Delay [s/veh]	0.12			3.72			11.42			11.00		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	5.49											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	10.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	4	53	5	3	75	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	54	5	3	78	5
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	15	1	1	22	1
Total Analysis Volume [veh/h]	4	60	6	3	87	6
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.06	0.00	0.00	0.05	0.00
d_M, Delay for Movement [s/veh]	9.97	8.57	0.00	0.00	7.36	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.19	0.19	0.00	0.00	0.18	0.18
95th-Percentile Queue Length [ft]	4.87	4.87	0.00	0.00	4.59	4.59
d_A, Approach Delay [s/veh]	8.66		0.00		6.89	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.20					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 13: Foster Ave/ Project Driveway

Control Type:	Two-way stop	Delay (sec / veh):	9.6
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.062

Intersection Setup

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	0	0	0	58	81	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	52	3	1	0	0	25
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	3	1	58	81	25
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	1	0	15	20	6
Total Analysis Volume [veh/h]	52	3	1	58	81	25
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.60	9.03	7.43	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.21	0.21	0.12	0.12	0.00	0.00
95th-Percentile Queue Length [ft]	5.22	5.22	3.10	3.10	0.00	0.00
d_A, Approach Delay [s/veh]	9.57		0.13		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.43					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 14: Foster Ave/Q St

Control Type:	Two-way stop	Delay (sec / veh):	9.7
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	Q St		Foster Ave			
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Q St		Foster Ave			
Base Volume Input [veh/h]	3	0	54	3	3	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	52	0	0	25
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	0	106	3	3	99
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	27	1	1	25
Total Analysis Volume [veh/h]	3	0	106	3	3	99
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.67	8.82	0.00	0.00	7.44	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.01	0.01	0.00	0.00	0.22	0.22
95th-Percentile Queue Length [ft]	0.29	0.29	0.00	0.00	5.54	5.54
d_A, Approach Delay [s/veh]	9.67		0.00		0.22	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.24					
Intersection LOS	A					

APPENDIX T.1

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Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Peak Hour Factor	0.9340	1.0000	0.9340	0.9340	1.0000	0.9340	1.0000	0.9340	0.9340	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	0	6	37	0	3	0	2	42	0	0	0
Total Analysis Volume [veh/h]	24	0	22	148	0	11	0	9	167	0	0	0
Pedestrian Volume [ped/h]	0			0			11			11		

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Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.16	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.97	0.00	9.22	0.00	0.00	0.00	0.00	10.30	9.10	0.00	0.00	0.00
Movement LOS	A		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.10	0.00	0.10	0.00	0.00	0.00	0.00	0.61	0.61	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	2.52	0.00	2.52	0.00	0.00	0.00	0.00	15.19	15.19	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.61			0.00			9.16			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	5.39											
Intersection LOS	B											

APPENDIX T.1

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Intersection Level Of Service Report

Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	12.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.129

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	160	93	68	25	18	129
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	160	93	68	25	18	129
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	42	24	18	7	5	34
Total Analysis Volume [veh/h]	168	97	71	26	19	135
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.13	0.03	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	12.26	10.08	7.70	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.44	0.44	0.38	0.38
95th-Percentile Queue Length [ft]	0.00	0.00	11.06	11.06	9.61	9.61
d_A, Approach Delay [s/veh]	0.00		11.68		0.95	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	2.48					
Intersection LOS	B					

APPENDIX T.1

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Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	36.1
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	280	155	170	243	307	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	0	0	0	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	283	155	170	243	307	183
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	76	42	46	65	83	49
Total Analysis Volume [veh/h]	304	167	183	261	330	197
Pedestrian Volume [ped/h]	147		0		0	

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	13.46	1.88	2.93	5.59	0.65	0.65
95th-Percentile Queue Length [ft]	336.55	46.94	73.14	139.78	16.32	16.32
Approach Delay [s/veh]	71.00	16.53		21.31		
Approach LOS	F	C		C		
Intersection Delay [s/veh]	36.07					
Intersection LOS	E					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	70.5
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.705

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	103	4	254	0	0	0	114	236	0	0	282	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	4	2	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	103	4	254	0	0	0	118	238	0	0	285	241
Peak Hour Factor	0.9490	0.9490	0.9490	1.0000	1.0000	1.0000	0.9490	0.9490	1.0000	1.0000	0.9490	0.9490
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	1	67	0	0	0	31	63	0	0	75	63
Total Analysis Volume [veh/h]	109	4	268	0	0	0	124	251	0	0	300	254
Pedestrian Volume [ped/h]	146			0			0			0		

Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.70	0.03	0.34	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	70.46	31.96	10.67	0.00	0.00	0.00	9.03	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	D	B				A	A			A	A
95th-Percentile Queue Length [veh]	4.15	0.72	0.67	0.00	0.00	0.00	0.42	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	103.69	18.11	16.82	0.00	0.00	0.00	10.38	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	28.00			0.00			2.99			0.00		
Approach LOS	D			A			A			A		
d_I, Intersection Delay [s/veh]	9.00											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	11.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	75	30	26	149	279	101	67	175	60	111	152	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	7	0	6	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	75	30	26	149	279	108	67	181	60	111	155	116
Peak Hour Factor	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	20	8	7	39	73	28	17	47	16	29	40	30
Total Analysis Volume [veh/h]	78	31	27	155	290	112	70	188	62	116	161	121
Pedestrian Volume [ped/h]	112			0			0			0		

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.88	1.22	1.01	1.01	0.64	0.48	1.55	0.35	0.89	1.25	0.76
95th-Percentile Queue Length [ft]	21.91	30.52	25.36	25.36	15.98	11.99	38.81	8.65	22.16	31.31	18.89
Approach Delay [s/veh]	10.84	11.23				11.82			11.59		
Approach LOS	B	B				B			B		
Intersection Delay [s/veh]	11.43										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset PM Existing + Creekside

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	8	2.0	0.163	4.3	LOS A	0.8	19.6	0.30	0.17	23.2
8	T1	9	2.0	0.163	4.3	LOS A	0.8	19.6	0.30	0.17	23.2
18	R2	181	2.0	0.163	4.3	LOS A	0.8	19.6	0.30	0.17	23.0
Approach		199	2.0	0.163	4.3	LOS A	0.8	19.6	0.30	0.17	23.0
East: Sunset Ave											
1	L2	202	2.0	0.255	4.8	LOS A	1.4	35.9	0.11	0.03	22.9
6	T1	116	2.0	0.255	4.8	LOS A	1.4	35.9	0.11	0.03	22.9
16	R2	34	2.0	0.255	4.8	LOS A	1.4	35.9	0.11	0.03	22.6
Approach		352	2.0	0.255	4.8	LOS A	1.4	35.9	0.11	0.03	22.8
North: Jay Street											
7	L2	34	2.0	0.046	4.0	LOS A	0.2	4.8	0.43	0.29	22.9
4	T1	10	2.0	0.046	4.0	LOS A	0.2	4.8	0.43	0.29	23.0
14	R2	2	2.0	0.046	4.0	LOS A	0.2	4.8	0.43	0.29	22.7
Approach		46	2.0	0.046	4.0	LOS A	0.2	4.8	0.43	0.29	22.9
West: Sunset Ave											
5	L2	1	2.0	0.102	4.2	LOS A	0.4	11.3	0.39	0.26	23.4
2	T1	99	2.0	0.102	4.2	LOS A	0.4	11.3	0.39	0.26	23.4
12	R2	11	2.0	0.102	4.2	LOS A	0.4	11.3	0.39	0.26	23.1
Approach		111	2.0	0.102	4.2	LOS A	0.4	11.3	0.39	0.26	23.4
All Vehicles		709	2.0	0.255	4.5	LOS A	1.4	35.9	0.23	0.12	23.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	39.8
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	20	329	105	100	303	25	30	24	18	102	27	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	41	0	0	0	0	13	10	6	27	0	10	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	61	329	105	100	303	38	40	30	45	102	37	124
Peak Hour Factor	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	90	29	27	83	10	11	8	12	28	10	34
Total Analysis Volume [veh/h]	66	358	114	109	330	41	44	33	49	111	40	135
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	13.20	10.28	1.18	1.07	1.69
95th-Percentile Queue Length [ft]	329.93	257.02	29.52	26.69	42.13
Approach Delay [s/veh]	56.36	42.72	14.55	14.64	
Approach LOS	F	E	B	B	
Intersection Delay [s/veh]	39.75				
Intersection LOS	E				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	9.5
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	3	37	3	3	56	2
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	37	3	3	56	2
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	10	1	1	16	1
Total Analysis Volume [veh/h]	3	41	3	3	62	2
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.04	0.00	0.00	0.04	0.00
d_M, Delay for Movement [s/veh]	9.48	8.48	0.00	0.00	7.32	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.13	0.13	0.00	0.00	0.12	0.12
95th-Percentile Queue Length [ft]	3.25	3.25	0.00	0.00	3.09	3.09
d_A, Approach Delay [s/veh]	8.55		0.00		7.09	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.28					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	16.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.103

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	11	340	315	42	35	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	41	27	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	381	342	42	35	5
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	99	89	11	9	1
Total Analysis Volume [veh/h]	11	397	356	44	36	5
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.10	0.01
d_M, Delay for Movement [s/veh]	8.14	0.00	0.00	0.00	16.42	10.42
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	1.60	1.60	0.00	0.00	0.34	0.02
95th-Percentile Queue Length [ft]	40.08	40.08	0.00	0.00	8.49	0.56
d_A, Approach Delay [s/veh]	0.22		0.00		15.69	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.86					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	26.1
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes		

Intersection Setup

Name				K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name				K St			11th St			11th St		
Base Volume Input [veh/h]	96	283	37	54	233	7	21	104	84	52	121	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	33	0	5	22	0	0	0	0	0	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	96	316	37	59	255	7	21	104	84	52	121	54
Peak Hour Factor	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	84	10	16	68	2	6	28	22	14	32	14
Total Analysis Volume [veh/h]	102	337	39	63	272	7	22	111	89	55	129	58
Pedestrian Volume [ped/h]	17			18			5			12		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	9.58	4.68	2.28	2.66
95th-Percentile Queue Length [ft]	239.50	117.08	57.01	66.61
Approach Delay [s/veh]	38.36	21.90	16.01	17.13
Approach LOS	E	C	C	C
Intersection Delay [s/veh]	26.11			
Intersection LOS	D			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	11.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	0	0	2	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	52	49	29	26	1	1	25	7	47	29	58
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	14	14	8	7	0	0	7	2	13	8	16
Total Analysis Volume [veh/h]	4	58	54	32	29	1	1	28	8	52	32	64
Pedestrian Volume [ped/h]	4			3			3			7		

Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.04	0.01	0.08	0.05	0.07
d_M, Delay for Movement [s/veh]	7.29	0.00	0.00	7.52	0.00	0.00	10.95	10.72	8.70	10.63	10.75	9.20
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.24	0.24	0.24	0.13	0.13	0.13	0.14	0.14	0.14	0.42	0.42	0.42
95th-Percentile Queue Length [ft]	5.96	5.96	5.96	3.33	3.33	3.33	3.49	3.49	3.49	10.46	10.46	10.46
d_A, Approach Delay [s/veh]	0.25			3.88			10.29			10.04		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	5.88											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.013

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	11	26	9	3	28	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	0	0	2	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	29	9	3	30	10
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	8	3	1	8	3
Total Analysis Volume [veh/h]	12	32	10	3	33	11
Pedestrian Volume [ped/h]	0		0		0	

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.03	0.00	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	9.19	8.53	0.00	0.00	7.29	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.14	0.14	0.00	0.00	0.08	0.08
95th-Percentile Queue Length [ft]	3.40	3.40	0.00	0.00	2.11	2.11
d_A, Approach Delay [s/veh]	8.71		0.00		5.47	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.18					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 13: Foster Avenue/ Creekside Prj Driveway

Control Type:	Two-way stop	Delay (sec / veh):	9.3
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.049

Intersection Setup

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	0	0	0	40	38	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	43	2	3	0	0	64
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	43	2	3	40	38	64
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	1	1	10	10	16
Total Analysis Volume [veh/h]	43	2	3	40	38	64
Pedestrian Volume [ped/h]	0		0		0	

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.32	8.85	7.42	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.16	0.16	0.09	0.09	0.00	0.00
95th-Percentile Queue Length [ft]	4.02	4.02	2.23	2.23	0.00	0.00
d_A, Approach Delay [s/veh]	9.30		0.52		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.32					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 14: Q St/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.5
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Q St		Foster Ave		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Q St		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	2	0	38	3	1	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	43	0	0	64
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	0	81	3	1	97
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	20	1	0	24
Total Analysis Volume [veh/h]	2	0	81	3	1	97
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.47	8.70	0.00	0.00	7.38	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.01	0.01	0.00	0.00	0.21	0.21
95th-Percentile Queue Length [ft]	0.19	0.19	0.00	0.00	5.19	5.19
d_A, Approach Delay [s/veh]	9.47		0.00		0.08	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.14					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.032

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	15	0	83	0	0	4	0	20	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	0	88	184	0	10	0	28	99	0	0	0
Peak Hour Factor	0.9140	1.0000	0.9140	0.9140	1.0000	0.9140	1.0000	0.9140	0.9140	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	0	24	50	0	3	0	8	27	0	0	0
Total Analysis Volume [veh/h]	22	0	96	201	0	11	0	31	108	0	0	0
Pedestrian Volume [ped/h]	0			0			9			9		

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.12	0.00	0.00	0.00	0.00	0.04	0.10	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.70	0.00	9.88	0.00	0.00	0.00	0.00	10.58	9.01	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.40	0.00	0.40	0.00	0.00	0.00	0.00	0.50	0.50	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	9.95	0.00	9.95	0.00	0.00	0.00	0.00	12.57	12.57	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.03			0.00			9.36			0.00		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	5.30											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	13.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.176

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	87	27	89	19	8	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	20	0	0	0	0	83
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	107	27	89	19	8	264
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	7	23	5	2	69
Total Analysis Volume [veh/h]	111	28	93	20	8	275
Pedestrian Volume [ped/h]	0		0		0	

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.18	0.02	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	13.00	10.08	7.48	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.63	0.63	0.72	0.72
95th-Percentile Queue Length [ft]	0.00	0.00	15.86	15.86	17.92	17.92
d_A, Approach Delay [s/veh]	0.00		12.49		0.21	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	2.75					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	15.7
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	95	95	183	225	158	392
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	11	18	73	10	2	30
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	106	113	256	235	160	422
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	31	71	65	44	117
Total Analysis Volume [veh/h]	118	126	284	261	178	469
Pedestrian Volume [ped/h]	75		0		0	

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Version 4.00-02

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.04	3.50	2.50	1.65	1.93	1.93
95th-Percentile Queue Length [ft]	76.10	87.47	62.57	41.34	48.23	48.23
Approach Delay [s/veh]	19.32	17.01		13.31		
Approach LOS	C	C		B		
Intersection Delay [s/veh]	15.73					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	72.9
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.693

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	74	0	118	0	0	0	93	430	0	0	251	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	0	2	0	0	0	19	30	0	0	21	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	90	0	120	0	0	0	112	460	0	0	272	67
Peak Hour Factor	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	0	33	0	0	0	31	128	0	0	76	19
Total Analysis Volume [veh/h]	100	0	133	0	0	0	124	511	0	0	302	74
Pedestrian Volume [ped/h]	75			0			0			0		

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No			
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.69	0.00	0.24	0.00	0.00	0.00	0.10	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	72.89	29.59	12.25	0.00	0.00	0.00	8.40	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	D	B				A	A			A	A
95th-Percentile Queue Length [veh]	3.95	0.40	0.40	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	98.78	9.99	9.99	0.00	0.00	0.00	8.76	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	38.28			0.00			1.64			0.00		
Approach LOS	E			A			A			A		
d_I, Intersection Delay [s/veh]	8.01											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	15.3
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	35	7	11	311	391	190	128	201	46	90	123	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	18	0	0	0	0	13	29	49	19	0	27	10
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	53	7	11	311	391	203	157	250	65	90	150	122
Peak Hour Factor	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	2	3	85	107	55	43	68	18	25	41	33
Total Analysis Volume [veh/h]	58	8	12	340	427	222	171	273	71	98	164	133
Pedestrian Volume [ped/h]	60			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.40	4.97	1.87	1.87	1.70	1.62	3.20	0.44	0.80	1.47	0.98
95th-Percentile Queue Length [ft]	10.12	124.2	46.71	46.71	42.38	40.59	79.94	11.00	20.05	36.87	24.61
Approach Delay [s/veh]	9.26	16.59				15.76			12.85		
Approach LOS	A	C				C			B		
Intersection Delay [s/veh]	15.34										
Intersection LOS	C										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset AM Existing + All Projects

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	29	2.0	0.281	6.0	LOS A	1.4	36.6	0.46	0.33	22.8
8	T1	2	2.0	0.281	6.0	LOS A	1.4	36.6	0.46	0.33	22.8
18	R2	277	2.0	0.281	6.0	LOS A	1.4	36.6	0.46	0.33	22.5
Approach		308	2.0	0.281	6.0	LOS A	1.4	36.6	0.46	0.33	22.6
East: Sunset Ave											
1	L2	261	2.0	0.331	5.6	LOS A	2.0	51.2	0.17	0.06	22.7
6	T1	178	2.0	0.331	5.6	LOS A	2.0	51.2	0.17	0.06	22.7
16	R2	12	2.0	0.331	5.6	LOS A	2.0	51.2	0.17	0.06	22.4
Approach		451	2.0	0.331	5.6	LOS A	2.0	51.2	0.17	0.06	22.7
North: Jay Street											
7	L2	53	2.0	0.079	4.9	LOS A	0.3	8.2	0.51	0.41	22.7
4	T1	14	2.0	0.079	4.9	LOS A	0.3	8.2	0.51	0.41	22.8
14	R2	1	2.0	0.079	4.9	LOS A	0.3	8.2	0.51	0.41	22.5
Approach		69	2.0	0.079	4.9	LOS A	0.3	8.2	0.51	0.41	22.7
West: Sunset Ave											
5	L2	1	2.0	0.199	5.4	LOS A	0.9	23.5	0.48	0.38	23.1
2	T1	189	2.0	0.199	5.4	LOS A	0.9	23.5	0.48	0.38	23.1
12	R2	11	2.0	0.199	5.4	LOS A	0.9	23.5	0.48	0.38	22.8
Approach		201	2.0	0.199	5.4	LOS A	0.9	23.5	0.48	0.38	23.1
All Vehicles		1029	2.0	0.331	5.6	LOS A	2.0	51.2	0.34	0.23	22.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	23.3
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	3	232	116	120	290	3	5	11	8	185	5	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	26	13	20	0	0	0	0	22	0	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	247	142	133	310	3	5	11	8	207	5	78
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	69	39	37	86	1	1	3	2	58	1	22
Total Analysis Volume [veh/h]	3	274	158	148	344	3	6	12	9	230	6	87
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	5.72	8.46	0.18	2.68	0.60
95th-Percentile Queue Length [ft]	143.07	211.61	4.55	67.03	15.10
Approach Delay [s/veh]	21.54	30.60	11.12	15.67	
Approach LOS	C	D	B	C	
Intersection Delay [s/veh]	23.34				
Intersection LOS	C				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	13.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	1	83	57	3	122	80
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	52	0	0	25
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	83	109	3	122	105
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	23	30	1	34	29
Total Analysis Volume [veh/h]	1	92	121	3	136	117
Pedestrian Volume [ped/h]	9		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.10	0.00	0.00	0.09	0.00
d_M, Delay for Movement [s/veh]	13.29	9.42	0.00	0.00	7.76	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.34	0.34	0.00	0.00	0.64	0.64
95th-Percentile Queue Length [ft]	8.61	8.61	0.00	0.00	15.93	15.93
d_A, Approach Delay [s/veh]	9.46		0.00		4.17	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.12					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	29.2
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.521

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	21	247	321	173	121	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	22	37	9	20	32
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	37	269	358	182	141	52
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	75	99	51	39	14
Total Analysis Volume [veh/h]	41	299	398	202	157	58
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.00	0.00	0.52	0.10
d_M, Delay for Movement [s/veh]	8.85	0.00	0.00	0.00	29.23	12.01
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh]	1.57	1.57	0.00	0.00	2.82	0.34
95th-Percentile Queue Length [ft]	39.25	39.25	0.00	0.00	70.51	8.43
d_A, Approach Delay [s/veh]	1.07		0.00		24.58	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	4.89					
Intersection LOS	D					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	17.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	K St			K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	K St			K St			11th St			11th St		
Base Volume Input [veh/h]	109	143	16	37	182	6	38	153	112	32	73	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	35	0	6	63	0	0	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	109	178	16	43	245	6	38	153	112	32	73	30
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	49	4	12	68	2	11	43	31	9	20	8
Total Analysis Volume [veh/h]	121	198	18	48	272	7	42	170	124	36	81	33
Pedestrian Volume [ped/h]	9			9			6			6		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.82	3.60	3.70	1.16
95th-Percentile Queue Length [ft]	95.58	89.96	92.47	29.08
Approach Delay [s/veh]	17.99	17.42	17.46	12.51
Approach LOS	C	C	C	B
Intersection Delay [s/veh]	16.96			
Intersection LOS	C			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	12.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.008

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	3	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	57	54	63	64	2	4	23	6	52	18	45
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	16	15	18	18	1	1	6	2	14	5	13
Total Analysis Volume [veh/h]	2	63	60	70	71	2	4	26	7	58	20	50
Pedestrian Volume [ped/h]	5			5			4			4		

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Intersection Settings

Priority Scheme	Free			Free			Stop			Stop		
Flared Lane							Yes			Yes		
Storage Area [veh]	0			0			1			1		
Two-Stage Gap Acceptance							No			No		
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.05	0.00	0.00	0.01	0.05	0.01	0.10	0.04	0.05
d_M, Delay for Movement [s/veh]	7.38	0.00	0.00	7.60	0.00	0.00	12.13	11.95	9.03	12.01	12.02	9.43
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.27	0.27	0.27	0.33	0.33	0.33	0.18	0.18	0.18	0.48	0.48	0.48
95th-Percentile Queue Length [ft]	6.73	6.73	6.73	8.17	8.17	8.17	4.40	4.40	4.40	11.98	11.98	11.98
d_A, Approach Delay [s/veh]	0.12			3.72			11.42			11.00		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	5.49											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	10.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	4	53	5	3	75	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	54	5	3	78	5
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	15	1	1	22	1
Total Analysis Volume [veh/h]	4	60	6	3	87	6
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.06	0.00	0.00	0.05	0.00
d_M, Delay for Movement [s/veh]	9.97	8.57	0.00	0.00	7.36	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.19	0.19	0.00	0.00	0.18	0.18
95th-Percentile Queue Length [ft]	4.87	4.87	0.00	0.00	4.59	4.59
d_A, Approach Delay [s/veh]	8.66		0.00		6.89	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.20					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 13: Foster Ave/ Project Driveway

Control Type:	Two-way stop	Delay (sec / veh):	9.6
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.062

Intersection Setup

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	0	0	0	58	81	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	52	3	1	0	0	25
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	3	1	58	81	25
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	1	0	15	20	6
Total Analysis Volume [veh/h]	52	3	1	58	81	25
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.60	9.03	7.43	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.21	0.21	0.12	0.12	0.00	0.00
95th-Percentile Queue Length [ft]	5.22	5.22	3.10	3.10	0.00	0.00
d_A, Approach Delay [s/veh]	9.57		0.13		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.43					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	11.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.129

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	0	44	0	0	15	0	84	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	0	65	138	0	25	0	92	156	0	0	0
Peak Hour Factor	0.9340	1.0000	0.9340	0.9340	1.0000	0.9340	1.0000	0.9340	0.9340	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	0	17	37	0	7	0	25	42	0	0	0
Total Analysis Volume [veh/h]	32	0	70	148	0	27	0	99	167	0	0	0
Pedestrian Volume [ped/h]	0			0			11			11		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Stop		Free	
Flared Lane	Yes				No			
Storage Area [veh]	1		0		0		0	
Two-Stage Gap Acceptance	No				No			
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.08	0.00	0.00	0.00	0.00	0.13	0.16	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.19	0.00	9.43	0.00	0.00	0.00	0.00	11.26	9.96	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.26	0.00	0.26	0.00	0.00	0.00	0.00	1.19	1.19	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	6.62	0.00	6.62	0.00	0.00	0.00	0.00	29.77	29.77	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.67			0.00			10.44			0.00		
Approach LOS	A			A			B			A		
d_I, Intersection Delay [s/veh]	6.93											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	13.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.154

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	160	93	68	25	18	129
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	84	0	0	0	0	44
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	244	93	68	25	18	173
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	64	24	18	7	5	45
Total Analysis Volume [veh/h]	255	97	71	26	19	181
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.15	0.04	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	13.84	10.93	7.91	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.54	0.54	0.57	0.57
95th-Percentile Queue Length [ft]	0.00	0.00	13.53	13.53	14.13	14.13
d_A, Approach Delay [s/veh]	0.00		13.06		0.75	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	2.18					
Intersection LOS	B					

APPENDIX T.1

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Version 4.00-02

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	73.1
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	280	155	170	243	307	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	36	74	39	5	10	23
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	316	229	209	248	317	204
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	85	62	56	67	85	55
Total Analysis Volume [veh/h]	340	246	225	267	341	219
Pedestrian Volume [ped/h]	147		0		0	

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Version 4.00-02

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	24.98	2.68	3.11	6.15	0.75	0.75
95th-Percentile Queue Length [ft]	624.44	66.99	77.84	153.86	18.81	18.81
Approach Delay [s/veh]	167.54	17.97		22.67		
Approach LOS	F	C		C		
Intersection Delay [s/veh]	73.09					
Intersection LOS	F					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	176.6
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.110

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	103	4	254	0	0	0	114	236	0	0	282	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	36	0	10	0	0	0	18	23	0	0	41	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	139	4	264	0	0	0	132	259	0	0	323	241
Peak Hour Factor	0.9490	0.9490	0.9490	1.0000	1.0000	1.0000	0.9490	0.9490	1.0000	1.0000	0.9490	0.9490
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	1	70	0	0	0	35	68	0	0	85	63
Total Analysis Volume [veh/h]	146	4	278	0	0	0	139	273	0	0	340	254
Pedestrian Volume [ped/h]	146			0			0			0		

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	1.11	0.03	0.36	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	176.56	36.29	10.95	0.00	0.00	0.00	9.27	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	E	B				A	A			A	A
95th-Percentile Queue Length [veh]	8.36	0.80	0.73	0.00	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	208.93	19.94	18.36	0.00	0.00	0.00	12.31	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	67.68			0.00			3.13			0.00		
Approach LOS	F			A			A			A		
d_I, Intersection Delay [s/veh]	21.10											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	12.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	75	30	26	149	279	101	67	175	60	111	152	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	26	0	0	0	0	23	29	41	27	0	72	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	101	30	26	149	279	124	96	216	87	111	224	121
Peak Hour Factor	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	8	7	39	73	32	25	56	23	29	58	31
Total Analysis Volume [veh/h]	105	31	27	155	290	129	100	225	91	116	233	126
Pedestrian Volume [ped/h]	112			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.05	1.30	1.08	1.08	0.82	0.75	2.13	0.55	0.91	2.25	0.82
95th-Percentile Queue Length [ft]	26.16	32.49	27.08	27.08	20.38	18.82	53.17	13.85	22.66	56.22	20.49
Approach Delay [s/veh]	10.83	11.84				12.94			13.10		
Approach LOS	B	B				B			B		
Intersection Delay [s/veh]	12.39										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset PM Existing + All Projects

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	8	2.0	0.239	5.1	LOS A	1.2	30.9	0.35	0.21	23.0
8	T1	20	2.0	0.239	5.1	LOS A	1.2	30.9	0.35	0.21	23.0
18	R2	260	2.0	0.239	5.1	LOS A	1.2	30.9	0.35	0.21	22.8
Approach		287	2.0	0.239	5.1	LOS A	1.2	30.9	0.35	0.21	22.8
East: Sunset Ave											
1	L2	285	2.0	0.341	5.7	LOS A	2.1	53.6	0.16	0.05	22.6
6	T1	116	2.0	0.341	5.7	LOS A	2.1	53.6	0.16	0.05	22.7
16	R2	65	2.0	0.341	5.7	LOS A	2.1	53.6	0.16	0.05	22.4
Approach		467	2.0	0.341	5.7	LOS A	2.1	53.6	0.16	0.05	22.6
North: Jay Street											
7	L2	49	2.0	0.072	4.5	LOS A	0.3	7.6	0.48	0.37	22.8
4	T1	15	2.0	0.072	4.5	LOS A	0.3	7.6	0.48	0.37	22.9
14	R2	2	2.0	0.072	4.5	LOS A	0.3	7.6	0.48	0.37	22.6
Approach		67	2.0	0.072	4.5	LOS A	0.3	7.6	0.48	0.37	22.8
West: Sunset Ave											
5	L2	1	2.0	0.113	4.7	LOS A	0.5	12.3	0.46	0.35	23.3
2	T1	99	2.0	0.113	4.7	LOS A	0.5	12.3	0.46	0.35	23.3
12	R2	11	2.0	0.113	4.7	LOS A	0.5	12.3	0.46	0.35	23.0
Approach		111	2.0	0.113	4.7	LOS A	0.5	12.3	0.46	0.35	23.3
All Vehicles		932	2.0	0.341	5.3	LOS A	2.1	53.6	0.28	0.16	22.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	42.1
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	13	354	113	100	322	6	5	16	12	109	20	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	25	29	20	21	0	0	0	0	37	0	20
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	379	142	120	343	6	5	16	12	146	20	144
Peak Hour Factor	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	103	39	33	93	2	1	4	3	40	5	39
Total Analysis Volume [veh/h]	14	413	155	131	374	7	5	17	13	159	22	157
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	14.23	11.06	0.27	1.66	1.60
95th-Percentile Queue Length [ft]	355.69	276.56	6.66	41.56	39.96
Approach Delay [s/veh]	57.78	44.29	12.18	14.72	
Approach LOS	F	E	B	B	
Intersection Delay [s/veh]	42.06				
Intersection LOS	E				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	3	37	41	3	56	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	43	0	0	64
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	37	84	3	56	100
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	10	23	1	16	28
Total Analysis Volume [veh/h]	3	41	93	3	62	111
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.04	0.00	0.00	0.04	0.00
d_M, Delay for Movement [s/veh]	10.86	8.93	0.00	0.00	7.51	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.15	0.15	0.00	0.00	0.39	0.39
95th-Percentile Queue Length [ft]	3.72	3.72	0.00	0.00	9.77	9.77
d_A, Approach Delay [s/veh]	9.06		0.00		2.69	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.76					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	24.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.323

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	18	340	315	69	68	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	41	43	38	23	16	27
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	59	383	353	92	84	38
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	100	92	24	22	10
Total Analysis Volume [veh/h]	61	399	368	96	88	40
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.00	0.00	0.00	0.32	0.06
d_M, Delay for Movement [s/veh]	8.47	0.00	0.00	0.00	24.39	11.03
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	2.11	2.11	0.00	0.00	1.35	0.20
95th-Percentile Queue Length [ft]	52.74	52.74	0.00	0.00	33.80	5.01
d_A, Approach Delay [s/veh]	1.12		0.00		20.22	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	2.95					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	39.0
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name				K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name				K St			11th St			11th St		
Base Volume Input [veh/h]	96	283	37	54	233	7	21	104	84	52	121	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	76	0	5	60	0	0	0	0	0	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	96	359	37	59	293	7	21	104	84	52	121	54
Peak Hour Factor	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	96	10	16	78	2	6	28	22	14	32	14
Total Analysis Volume [veh/h]	102	382	39	63	312	7	22	111	89	55	129	58
Pedestrian Volume [ped/h]	17			18			5			12		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	13.79	6.70	2.56	3.00
95th-Percentile Queue Length [ft]	344.73	167.59	63.98	74.90
Approach Delay [s/veh]	63.66	29.99	17.81	19.16
Approach LOS	F	D	C	C
Intersection Delay [s/veh]	38.96			
Intersection LOS	E			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	11.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	0	0	2	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	52	49	29	26	1	1	25	7	47	29	58
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	14	14	8	7	0	0	7	2	13	8	16
Total Analysis Volume [veh/h]	4	58	54	32	29	1	1	28	8	52	32	64
Pedestrian Volume [ped/h]	4			3			3			7		

Intersection Settings

Priority Scheme	Free			Free			Stop			Stop		
Flared Lane							Yes			Yes		
Storage Area [veh]	0			0			1			1		
Two-Stage Gap Acceptance							No			No		
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.04	0.01	0.08	0.05	0.07
d_M, Delay for Movement [s/veh]	7.29	0.00	0.00	7.52	0.00	0.00	10.95	10.72	8.70	10.63	10.75	9.20
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.24	0.24	0.24	0.13	0.13	0.13	0.14	0.14	0.14	0.42	0.42	0.42
95th-Percentile Queue Length [ft]	5.96	5.96	5.96	3.33	3.33	3.33	3.49	3.49	3.49	10.46	10.46	10.46
d_A, Approach Delay [s/veh]	0.25			3.88			10.29			10.04		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	5.88											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.013

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	11	26	9	3	28	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	0	0	2	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	29	9	3	30	10
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	8	3	1	8	3
Total Analysis Volume [veh/h]	12	32	10	3	33	11
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.03	0.00	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	9.19	8.53	0.00	0.00	7.29	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.14	0.14	0.00	0.00	0.08	0.08
95th-Percentile Queue Length [ft]	3.40	3.40	0.00	0.00	2.11	2.11
d_A, Approach Delay [s/veh]	8.71		0.00		5.47	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.18					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.032

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	15	0	83	0	0	4	0	20	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	20	0	88	184	0	10	0	28	99	0	0	0
Peak Hour Factor	0.9140	1.0000	0.9140	0.9140	1.0000	0.9140	1.0000	0.9140	0.9140	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	0	24	50	0	3	0	8	27	0	0	0
Total Analysis Volume [veh/h]	22	0	96	201	0	11	0	31	108	0	0	0
Pedestrian Volume [ped/h]	0			0			9			9		

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.12	0.00	0.00	0.00	0.00	0.04	0.10	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.70	0.00	9.88	0.00	0.00	0.00	0.00	10.58	9.01	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.40	0.00	0.40	0.00	0.00	0.00	0.00	0.50	0.50	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	9.95	0.00	9.95	0.00	0.00	0.00	0.00	12.57	12.57	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.03			0.00			9.36			0.00		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	5.30											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	13.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.176

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	87	27	89	19	8	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	20	0	0	0	0	83
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	107	27	89	19	8	264
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	7	23	5	2	69
Total Analysis Volume [veh/h]	111	28	93	20	8	275
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.18	0.02	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	13.00	10.08	7.48	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.63	0.63	0.72	0.72
95th-Percentile Queue Length [ft]	0.00	0.00	15.86	15.86	17.92	17.92
d_A, Approach Delay [s/veh]	0.00		12.49		0.21	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	2.75					
Intersection LOS	B					

APPENDIX T.1

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Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	15.7
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	95	95	183	225	158	392
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	11	18	73	10	2	30
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	106	113	256	235	160	422
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	31	71	65	44	117
Total Analysis Volume [veh/h]	118	126	284	261	178	469
Pedestrian Volume [ped/h]	75		0		0	

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Version 4.00-02

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.04	3.50	2.50	1.65	1.93	1.93
95th-Percentile Queue Length [ft]	76.10	87.47	62.57	41.34	48.23	48.23
Approach Delay [s/veh]	19.32	17.01		13.31		
Approach LOS	C	C		B		
Intersection Delay [s/veh]	15.73					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	72.9
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.693

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	74	0	118	0	0	0	93	430	0	0	251	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	0	2	0	0	0	19	30	0	0	21	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	90	0	120	0	0	0	112	460	0	0	272	67
Peak Hour Factor	0.9000	0.9000	0.9000	1.0000	1.0000	1.0000	0.9000	0.9000	1.0000	1.0000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	0	33	0	0	0	31	128	0	0	76	19
Total Analysis Volume [veh/h]	100	0	133	0	0	0	124	511	0	0	302	74
Pedestrian Volume [ped/h]	75			0			0			0		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.69	0.00	0.24	0.00	0.00	0.00	0.10	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	72.89	29.59	12.25	0.00	0.00	0.00	8.40	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	D	B				A	A			A	A
95th-Percentile Queue Length [veh]	3.95	0.40	0.40	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	98.78	9.99	9.99	0.00	0.00	0.00	8.76	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	38.28			0.00			1.64			0.00		
Approach LOS	E			A			A			A		
d_I, Intersection Delay [s/veh]	8.01											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	15.3
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	35	7	11	311	391	190	128	201	46	90	123	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	18	0	0	0	0	13	29	49	19	0	27	10
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	53	7	11	311	391	203	157	250	65	90	150	122
Peak Hour Factor	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160	0.9160
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	14	2	3	85	107	55	43	68	18	25	41	33
Total Analysis Volume [veh/h]	58	8	12	340	427	222	171	273	71	98	164	133
Pedestrian Volume [ped/h]	60			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.40	4.97	1.87	1.87	1.70	1.62	3.20	0.44	0.80	1.47	0.98
95th-Percentile Queue Length [ft]	10.12	124.2	46.71	46.71	42.38	40.59	79.94	11.00	20.05	36.87	24.61
Approach Delay [s/veh]	9.26	16.59				15.76			12.85		
Approach LOS	A	C				C			B		
Intersection Delay [s/veh]	15.34										
Intersection LOS	C										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset AM Existing + All Projects

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	29	2.0	0.281	6.0	LOS A	1.4	36.6	0.46	0.33	22.8
8	T1	2	2.0	0.281	6.0	LOS A	1.4	36.6	0.46	0.33	22.8
18	R2	277	2.0	0.281	6.0	LOS A	1.4	36.6	0.46	0.33	22.5
Approach		308	2.0	0.281	6.0	LOS A	1.4	36.6	0.46	0.33	22.6
East: Sunset Ave											
1	L2	261	2.0	0.331	5.6	LOS A	2.0	51.2	0.17	0.06	22.7
6	T1	178	2.0	0.331	5.6	LOS A	2.0	51.2	0.17	0.06	22.7
16	R2	12	2.0	0.331	5.6	LOS A	2.0	51.2	0.17	0.06	22.4
Approach		451	2.0	0.331	5.6	LOS A	2.0	51.2	0.17	0.06	22.7
North: Jay Street											
7	L2	53	2.0	0.079	4.9	LOS A	0.3	8.2	0.51	0.41	22.7
4	T1	14	2.0	0.079	4.9	LOS A	0.3	8.2	0.51	0.41	22.8
14	R2	1	2.0	0.079	4.9	LOS A	0.3	8.2	0.51	0.41	22.5
Approach		69	2.0	0.079	4.9	LOS A	0.3	8.2	0.51	0.41	22.7
West: Sunset Ave											
5	L2	1	2.0	0.199	5.4	LOS A	0.9	23.5	0.48	0.38	23.1
2	T1	189	2.0	0.199	5.4	LOS A	0.9	23.5	0.48	0.38	23.1
12	R2	11	2.0	0.199	5.4	LOS A	0.9	23.5	0.48	0.38	22.8
Approach		201	2.0	0.199	5.4	LOS A	0.9	23.5	0.48	0.38	23.1
All Vehicles		1029	2.0	0.331	5.6	LOS A	2.0	51.2	0.34	0.23	22.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	29.1
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd						Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd						Foster Ave		
Base Volume Input [veh/h]	11	201	101	120	251	43	36	26	16	159	31	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	21	4	17	13	17	3	11	9	32	21	1	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	205	118	133	268	46	47	35	48	180	32	78
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	57	33	37	74	13	13	10	13	50	9	22
Total Analysis Volume [veh/h]	36	228	131	148	298	51	52	39	53	200	36	87
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	6.07	10.86	1.35	2.41	0.99
95th-Percentile Queue Length [ft]	151.86	271.51	33.70	60.26	24.63
Approach Delay [s/veh]	25.51	44.68	14.58	16.01	
Approach LOS	D	E	B	C	
Intersection Delay [s/veh]	29.11				
Intersection LOS	D				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	11.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	1	83	3	3	122	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	83	3	3	122	3
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	23	1	1	34	1
Total Analysis Volume [veh/h]	1	92	3	3	136	3
Pedestrian Volume [ped/h]	9		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.09	0.00	0.00	0.09	0.00
d_M, Delay for Movement [s/veh]	10.99	8.74	0.00	0.00	7.48	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.29	0.29	0.00	0.00	0.29	0.29
95th-Percentile Queue Length [ft]	7.27	7.27	0.00	0.00	7.18	7.18
d_A, Approach Delay [s/veh]	8.76		0.00		7.32	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.70					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	19.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.250

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	13	247	321	104	75	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	38	69	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	285	390	104	75	12
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	79	108	29	21	3
Total Analysis Volume [veh/h]	14	317	433	116	83	13
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.25	0.02
d_M, Delay for Movement [s/veh]	8.58	0.00	0.00	0.00	19.45	11.38
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	1.42	1.42	0.00	0.00	0.97	0.07
95th-Percentile Queue Length [ft]	35.42	35.42	0.00	0.00	24.29	1.73
d_A, Approach Delay [s/veh]	0.36		0.00		18.35	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	1.93					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	17.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	K St			K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	K St			K St			11th St			11th St		
Base Volume Input [veh/h]	109	143	16	37	182	6	38	153	112	32	73	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	35	0	6	63	0	0	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	109	178	16	43	245	6	38	153	112	32	73	30
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	30	49	4	12	68	2	11	43	31	9	20	8
Total Analysis Volume [veh/h]	121	198	18	48	272	7	42	170	124	36	81	33
Pedestrian Volume [ped/h]	9			9			6			6		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.82	3.60	3.70	1.16
95th-Percentile Queue Length [ft]	95.58	89.96	92.47	29.08
Approach Delay [s/veh]	17.99	17.42	17.46	12.51
Approach LOS	C	C	C	B
Intersection Delay [s/veh]	16.96			
Intersection LOS	C			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	12.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.008

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	3	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	57	54	63	64	2	4	23	6	52	18	45
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	16	15	18	18	1	1	6	2	14	5	13
Total Analysis Volume [veh/h]	2	63	60	70	71	2	4	26	7	58	20	50
Pedestrian Volume [ped/h]	5			5			4			4		

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Intersection Settings

Priority Scheme	Free			Free			Stop			Stop		
Flared Lane							Yes			Yes		
Storage Area [veh]	0			0			1			1		
Two-Stage Gap Acceptance							No			No		
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.05	0.00	0.00	0.01	0.05	0.01	0.10	0.04	0.05
d_M, Delay for Movement [s/veh]	7.38	0.00	0.00	7.60	0.00	0.00	12.13	11.95	9.03	12.01	12.02	9.43
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.27	0.27	0.27	0.33	0.33	0.33	0.18	0.18	0.18	0.48	0.48	0.48
95th-Percentile Queue Length [ft]	6.73	6.73	6.73	8.17	8.17	8.17	4.40	4.40	4.40	11.98	11.98	11.98
d_A, Approach Delay [s/veh]	0.12			3.72			11.42			11.00		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	5.49											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	10.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	4	53	5	3	75	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	54	5	3	78	5
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	15	1	1	22	1
Total Analysis Volume [veh/h]	4	60	6	3	87	6
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.06	0.00	0.00	0.05	0.00
d_M, Delay for Movement [s/veh]	9.97	8.57	0.00	0.00	7.36	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.19	0.19	0.00	0.00	0.18	0.18
95th-Percentile Queue Length [ft]	4.87	4.87	0.00	0.00	4.59	4.59
d_A, Approach Delay [s/veh]	8.66		0.00		6.89	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.20					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 13: Foster Ave/ Project Driveway

Control Type:	Two-way stop	Delay (sec / veh):	9.6
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.062

Intersection Setup

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	0	0	0	58	81	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	52	3	1	0	0	25
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	3	1	58	81	25
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	1	0	15	20	6
Total Analysis Volume [veh/h]	52	3	1	58	81	25
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.60	9.03	7.43	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.21	0.21	0.12	0.12	0.00	0.00
95th-Percentile Queue Length [ft]	5.22	5.22	3.10	3.10	0.00	0.00
d_A, Approach Delay [s/veh]	9.57		0.13		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.43					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 14: Foster Ave/Q St

Control Type:	Two-way stop	Delay (sec / veh):	9.7
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	Q St		Foster Ave			
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Q St		Foster Ave			
Base Volume Input [veh/h]	3	0	54	3	3	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	52	0	0	25
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	0	106	3	3	99
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	27	1	1	25
Total Analysis Volume [veh/h]	3	0	106	3	3	99
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.67	8.82	0.00	0.00	7.44	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.01	0.01	0.00	0.00	0.22	0.22
95th-Percentile Queue Length [ft]	0.29	0.29	0.00	0.00	5.54	5.54
d_A, Approach Delay [s/veh]	9.67		0.00		0.22	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.24					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	11.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.129

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	0	44	0	0	15	0	84	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	0	65	138	0	25	0	92	156	0	0	0
Peak Hour Factor	0.9340	1.0000	0.9340	0.9340	1.0000	0.9340	1.0000	0.9340	0.9340	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	0	17	37	0	7	0	25	42	0	0	0
Total Analysis Volume [veh/h]	32	0	70	148	0	27	0	99	167	0	0	0
Pedestrian Volume [ped/h]	0			0			11			11		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Stop		Free	
Flared Lane	Yes				No			
Storage Area [veh]	1		0		0		0	
Two-Stage Gap Acceptance	No				No			
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.08	0.00	0.00	0.00	0.00	0.13	0.16	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.19	0.00	9.43	0.00	0.00	0.00	0.00	11.26	9.96	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.26	0.00	0.26	0.00	0.00	0.00	0.00	1.19	1.19	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	6.62	0.00	6.62	0.00	0.00	0.00	0.00	29.77	29.77	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.67			0.00			10.44			0.00		
Approach LOS	A			A			B			A		
d_I, Intersection Delay [s/veh]	6.93											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	13.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.154

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	160	93	68	25	18	129
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	84	0	0	0	0	44
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	244	93	68	25	18	173
Peak Hour Factor	0.9550	0.9550	0.9550	0.9550	0.9550	0.9550
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	64	24	18	7	5	45
Total Analysis Volume [veh/h]	255	97	71	26	19	181
Pedestrian Volume [ped/h]	0		0		0	

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.15	0.04	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	13.84	10.93	7.91	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.54	0.54	0.57	0.57
95th-Percentile Queue Length [ft]	0.00	0.00	13.53	13.53	14.13	14.13
d_A, Approach Delay [s/veh]	0.00		13.06		0.75	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	2.18					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	73.1
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	280	155	170	243	307	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	36	74	39	5	10	23
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	316	229	209	248	317	204
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	85	62	56	67	85	55
Total Analysis Volume [veh/h]	340	246	225	267	341	219
Pedestrian Volume [ped/h]	147		0		0	

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	24.98	2.68	3.11	6.15	0.75	0.75
95th-Percentile Queue Length [ft]	624.44	66.99	77.84	153.86	18.81	18.81
Approach Delay [s/veh]	167.54	17.97		22.67		
Approach LOS	F	C		C		
Intersection Delay [s/veh]	73.09					
Intersection LOS	F					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	176.6
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.110

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	103	4	254	0	0	0	114	236	0	0	282	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	36	0	10	0	0	0	18	23	0	0	41	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	139	4	264	0	0	0	132	259	0	0	323	241
Peak Hour Factor	0.9490	0.9490	0.9490	1.0000	1.0000	1.0000	0.9490	0.9490	1.0000	1.0000	0.9490	0.9490
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	1	70	0	0	0	35	68	0	0	85	63
Total Analysis Volume [veh/h]	146	4	278	0	0	0	139	273	0	0	340	254
Pedestrian Volume [ped/h]	146			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No			
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	1.11	0.03	0.36	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	176.56	36.29	10.95	0.00	0.00	0.00	9.27	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	E	B				A	A			A	A
95th-Percentile Queue Length [veh]	8.36	0.80	0.73	0.00	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	208.93	19.94	18.36	0.00	0.00	0.00	12.31	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	67.68			0.00			3.13			0.00		
Approach LOS	F			A			A			A		
d_I, Intersection Delay [s/veh]	21.10											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	12.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	75	30	26	149	279	101	67	175	60	111	152	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	26	0	0	0	0	23	29	41	27	0	72	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	101	30	26	149	279	124	96	216	87	111	224	121
Peak Hour Factor	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610	0.9610
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	8	7	39	73	32	25	56	23	29	58	31
Total Analysis Volume [veh/h]	105	31	27	155	290	129	100	225	91	116	233	126
Pedestrian Volume [ped/h]	112			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.05	1.30	1.08	1.08	0.82	0.75	2.13	0.55	0.91	2.25	0.82
95th-Percentile Queue Length [ft]	26.16	32.49	27.08	27.08	20.38	18.82	53.17	13.85	22.66	56.22	20.49
Approach Delay [s/veh]	10.83	11.84				12.94			13.10		
Approach LOS	B	B				B			B		
Intersection Delay [s/veh]	12.39										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset PM Existing + All Projects

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	8	2.0	0.239	5.1	LOS A	1.2	30.9	0.35	0.21	23.0
8	T1	20	2.0	0.239	5.1	LOS A	1.2	30.9	0.35	0.21	23.0
18	R2	260	2.0	0.239	5.1	LOS A	1.2	30.9	0.35	0.21	22.8
Approach		287	2.0	0.239	5.1	LOS A	1.2	30.9	0.35	0.21	22.8
East: Sunset Ave											
1	L2	285	2.0	0.341	5.7	LOS A	2.1	53.6	0.16	0.05	22.6
6	T1	116	2.0	0.341	5.7	LOS A	2.1	53.6	0.16	0.05	22.7
16	R2	65	2.0	0.341	5.7	LOS A	2.1	53.6	0.16	0.05	22.4
Approach		467	2.0	0.341	5.7	LOS A	2.1	53.6	0.16	0.05	22.6
North: Jay Street											
7	L2	49	2.0	0.072	4.5	LOS A	0.3	7.6	0.48	0.37	22.8
4	T1	15	2.0	0.072	4.5	LOS A	0.3	7.6	0.48	0.37	22.9
14	R2	2	2.0	0.072	4.5	LOS A	0.3	7.6	0.48	0.37	22.6
Approach		67	2.0	0.072	4.5	LOS A	0.3	7.6	0.48	0.37	22.8
West: Sunset Ave											
5	L2	1	2.0	0.113	4.7	LOS A	0.5	12.3	0.46	0.35	23.3
2	T1	99	2.0	0.113	4.7	LOS A	0.5	12.3	0.46	0.35	23.3
12	R2	11	2.0	0.113	4.7	LOS A	0.5	12.3	0.46	0.35	23.0
Approach		111	2.0	0.113	4.7	LOS A	0.5	12.3	0.46	0.35	23.3
All Vehicles		932	2.0	0.341	5.3	LOS A	2.1	53.6	0.28	0.16	22.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	58.6
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	20	329	105	100	303	25	30	24	18	102	27	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	41	15	23	20	8	13	10	6	27	27	10	20
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	61	344	128	120	311	38	40	30	45	129	37	144
Peak Hour Factor	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	94	35	33	85	10	11	8	12	35	10	39
Total Analysis Volume [veh/h]	66	375	139	131	339	41	44	33	49	141	40	157
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	18.23	12.97	1.22	1.48	2.03
95th-Percentile Queue Length [ft]	455.84	324.29	30.47	37.08	50.80
Approach Delay [s/veh]	92.95	58.79	14.94	15.74	
Approach LOS	F	F	B	C	
Intersection Delay [s/veh]	58.62				
Intersection LOS	F				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	9.5
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	3	37	3	3	56	2
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	37	3	3	56	2
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	10	1	1	16	1
Total Analysis Volume [veh/h]	3	41	3	3	62	2
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.04	0.00	0.00	0.04	0.00
d_M, Delay for Movement [s/veh]	9.48	8.48	0.00	0.00	7.32	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.13	0.13	0.00	0.00	0.12	0.12
95th-Percentile Queue Length [ft]	3.25	3.25	0.00	0.00	3.09	3.09
d_A, Approach Delay [s/veh]	8.55		0.00		7.09	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.28					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	18.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.115

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	11	340	315	42	35	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	84	65	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	424	380	42	35	5
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	110	99	11	9	1
Total Analysis Volume [veh/h]	11	442	396	44	36	5
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.12	0.01
d_M, Delay for Movement [s/veh]	8.25	0.00	0.00	0.00	18.01	10.71
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	1.99	1.99	0.00	0.00	0.39	0.02
95th-Percentile Queue Length [ft]	49.76	49.76	0.00	0.00	9.66	0.60
d_A, Approach Delay [s/veh]	0.20		0.00		17.12	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.85					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	39.0
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name				K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name				K St			11th St			11th St		
Base Volume Input [veh/h]	96	283	37	54	233	7	21	104	84	52	121	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	76	0	5	60	0	0	0	0	0	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	96	359	37	59	293	7	21	104	84	52	121	54
Peak Hour Factor	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390	0.9390
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	96	10	16	78	2	6	28	22	14	32	14
Total Analysis Volume [veh/h]	102	382	39	63	312	7	22	111	89	55	129	58
Pedestrian Volume [ped/h]	17			18			5			12		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	13.79	6.70	2.56	3.00
95th-Percentile Queue Length [ft]	344.73	167.59	63.98	74.90
Approach Delay [s/veh]	63.66	29.99	17.81	19.16
Approach LOS	F	D	C	C
Intersection Delay [s/veh]	38.96			
Intersection LOS	E			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	11.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	0	0	2	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	52	49	29	26	1	1	25	7	47	29	58
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	14	14	8	7	0	0	7	2	13	8	16
Total Analysis Volume [veh/h]	4	58	54	32	29	1	1	28	8	52	32	64
Pedestrian Volume [ped/h]	4			3			3			7		

Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.04	0.01	0.08	0.05	0.07
d_M, Delay for Movement [s/veh]	7.29	0.00	0.00	7.52	0.00	0.00	10.95	10.72	8.70	10.63	10.75	9.20
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.24	0.24	0.24	0.13	0.13	0.13	0.14	0.14	0.14	0.42	0.42	0.42
95th-Percentile Queue Length [ft]	5.96	5.96	5.96	3.33	3.33	3.33	3.49	3.49	3.49	10.46	10.46	10.46
d_A, Approach Delay [s/veh]	0.25			3.88			10.29			10.04		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	5.88											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.2
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.013

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	11	26	9	3	28	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	0	0	2	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	29	9	3	30	10
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	8	3	1	8	3
Total Analysis Volume [veh/h]	12	32	10	3	33	11
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.03	0.00	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	9.19	8.53	0.00	0.00	7.29	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.14	0.14	0.00	0.00	0.08	0.08
95th-Percentile Queue Length [ft]	3.40	3.40	0.00	0.00	2.11	2.11
d_A, Approach Delay [s/veh]	8.71		0.00		5.47	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.18					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 13: Foster Avenue/ Creekside Prj Driveway

Control Type:	Two-way stop	Delay (sec / veh):	9.3
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.049

Intersection Setup

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	0	0	0	40	38	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	43	2	3	0	0	64
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	43	2	3	40	38	64
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	1	1	10	10	16
Total Analysis Volume [veh/h]	43	2	3	40	38	64
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.32	8.85	7.42	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.16	0.16	0.09	0.09	0.00	0.00
95th-Percentile Queue Length [ft]	4.02	4.02	2.23	2.23	0.00	0.00
d_A, Approach Delay [s/veh]	9.30		0.52		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.32					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 14: Q St/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.5
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Q St		Foster Ave		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Q St		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	2	0	38	3	1	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	43	0	0	64
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	2	0	81	3	1	97
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	20	1	0	24
Total Analysis Volume [veh/h]	2	0	81	3	1	97
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.47	8.70	0.00	0.00	7.38	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.01	0.01	0.00	0.00	0.21	0.21
95th-Percentile Queue Length [ft]	0.19	0.19	0.00	0.00	5.19	5.19
d_A, Approach Delay [s/veh]	9.47		0.00		0.08	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.14					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.016

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.00	1.35	1.35	1.00	1.35	1.00	1.35	1.35	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	0	7	248	0	8	0	11	134	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	0	2	62	0	2	0	3	34	0	0	0
Total Analysis Volume [veh/h]	7	0	7	248	0	8	0	11	134	0	0	0
Pedestrian Volume [ped/h]	0			0			9			9		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Stop		Free	
Flared Lane	Yes				No			
Storage Area [veh]	1		0		0		0	
Two-Stage Gap Acceptance	No				No			
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.13	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.57	0.00	9.70	0.00	0.00	0.00	0.00	10.88	8.97	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.49	0.49	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.82	0.00	0.82	0.00	0.00	0.00	0.00	12.37	12.37	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.14			0.00			9.11			0.00		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	3.53											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	13.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.222

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	87	27	89	19	8	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	117	36	120	26	11	244
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	9	30	7	3	61
Total Analysis Volume [veh/h]	117	36	120	26	11	244
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.22	0.03	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	13.23	10.50	7.50	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.85	0.85	0.64	0.64
95th-Percentile Queue Length [ft]	0.00	0.00	21.16	21.16	15.94	15.94
d_A, Approach Delay [s/veh]	0.00		12.74		0.32	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	3.51					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	17.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	95	95	183	225	158	392
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	128	128	247	304	213	529
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	32	62	76	53	132
Total Analysis Volume [veh/h]	128	128	247	304	213	529
Pedestrian Volume [ped/h]	75		0		0	

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.56	2.90	3.59	2.24	2.41	2.41
95th-Percentile Queue Length [ft]	89.09	72.50	89.77	55.95	60.37	60.37
Approach Delay [s/veh]	21.67	18.12		14.74		
Approach LOS	C	C		B		
Intersection Delay [s/veh]	17.09					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	112.5
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.841

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	74	0	118	0	0	0	93	430	0	0	251	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.00	1.00	1.00	1.35	1.35	1.00	1.00	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	100	0	159	0	0	0	126	581	0	0	339	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	0	40	0	0	0	32	145	0	0	85	23
Total Analysis Volume [veh/h]	100	0	159	0	0	0	126	581	0	0	339	90
Pedestrian Volume [ped/h]	75			0			0			0		

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No			
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.84	0.00	0.31	0.00	0.00	0.00	0.11	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	112.50	34.77	13.29	0.00	0.00	0.00	8.58	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	D	B				A	A			A	A
95th-Percentile Queue Length [veh]	5.06	0.54	0.54	0.00	0.00	0.00	0.38	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	126.45	13.60	13.60	0.00	0.00	0.00	9.38	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	51.59			0.00			1.53			0.00		
Approach LOS	F			A			A			A		
d_I, Intersection Delay [s/veh]	10.35											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	20.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	35	7	11	311	391	190	128	201	46	90	123	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	47	9	15	420	528	257	173	271	62	122	166	151
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	2	4	105	132	64	43	68	16	31	42	38
Total Analysis Volume [veh/h]	47	9	15	420	528	257	173	271	62	122	166	151
Pedestrian Volume [ped/h]	60			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.38	8.74	2.77	2.77	2.23	1.87	3.70	0.42	1.19	1.71	1.33
95th-Percentile Queue Length [ft]	9.49	218.5	69.13	69.13	55.76	46.63	92.46	10.50	29.70	42.69	33.19
Approach Delay [s/veh]	9.45	23.52				18.16			14.64		
Approach LOS	A	C				C			B		
Intersection Delay [s/veh]	20.09										
Intersection LOS	C										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset AM Future

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	35	2.0	0.255	5.8	LOS A	1.3	32.1	0.46	0.34	22.8
8	T1	1	2.0	0.255	5.8	LOS A	1.3	32.1	0.46	0.34	22.8
18	R2	238	2.0	0.255	5.8	LOS A	1.3	32.1	0.46	0.34	22.6
Approach		274	2.0	0.255	5.8	LOS A	1.3	32.1	0.46	0.34	22.6
East: Sunset Ave											
1	L2	247	2.0	0.347	5.8	LOS A	2.1	54.6	0.19	0.07	22.7
6	T1	216	2.0	0.347	5.8	LOS A	2.1	54.6	0.19	0.07	22.7
16	R2	7	2.0	0.347	5.8	LOS A	2.1	54.6	0.19	0.07	22.4
Approach		470	2.0	0.347	5.8	LOS A	2.1	54.6	0.19	0.07	22.7
North: Jay Street											
7	L2	32	2.0	0.047	4.7	LOS A	0.2	4.8	0.52	0.40	22.7
4	T1	7	2.0	0.047	4.7	LOS A	0.2	4.8	0.52	0.40	22.8
14	R2	1	2.0	0.047	4.7	LOS A	0.2	4.8	0.52	0.40	22.5
Approach		40	2.0	0.047	4.7	LOS A	0.2	4.8	0.52	0.40	22.7
West: Sunset Ave											
5	L2	1	2.0	0.232	5.6	LOS A	1.1	28.6	0.47	0.35	23.0
2	T1	230	2.0	0.232	5.6	LOS A	1.1	28.6	0.47	0.35	23.1
12	R2	14	2.0	0.232	5.6	LOS A	1.1	28.6	0.47	0.35	22.8
Approach		245	2.0	0.232	5.6	LOS A	1.1	28.6	0.47	0.35	23.1
All Vehicles		1029	2.0	0.347	5.7	LOS A	2.1	54.6	0.34	0.22	22.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	38.4
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	3	232	116	120	290	3	5	11	8	185	5	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	313	157	162	392	4	7	15	11	250	7	88
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	78	39	41	98	1	2	4	3	63	2	22
Total Analysis Volume [veh/h]	4	313	157	162	392	4	7	15	11	250	7	88
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	8.46	13.74	0.25	3.45	0.67
95th-Percentile Queue Length [ft]	211.44	343.51	6.23	86.16	16.77
Approach Delay [s/veh]	32.17	57.58	12.11	18.40	
Approach LOS	D	F	B	C	
Intersection Delay [s/veh]	38.39				
Intersection LOS	E				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	13.5
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	1	83	57	3	122	80
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	112	77	4	165	108
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	28	19	1	41	27
Total Analysis Volume [veh/h]	1	112	77	4	165	108
Pedestrian Volume [ped/h]	9		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.12	0.00	0.00	0.11	0.00
d_M, Delay for Movement [s/veh]	13.55	9.25	0.00	0.00	7.71	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.40	0.40	0.00	0.00	0.67	0.67
95th-Percentile Queue Length [ft]	10.06	10.06	0.00	0.00	16.72	16.72
d_A, Approach Delay [s/veh]	9.29		0.00		4.66	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.97					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	33.9
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.578

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	21	247	321	173	121	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	333	433	234	163	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	83	108	59	41	7
Total Analysis Volume [veh/h]	28	333	433	234	163	27
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.00	0.00	0.58	0.05
d_M, Delay for Movement [s/veh]	9.02	0.00	0.00	0.00	33.89	12.09
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh]	1.88	1.88	0.00	0.00	3.35	0.16
95th-Percentile Queue Length [ft]	46.96	46.96	0.00	0.00	83.86	3.98
d_A, Approach Delay [s/veh]	0.70		0.00		30.80	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	5.01					
Intersection LOS	D					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	22.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	K St			K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	K St			K St			11th St			11th St		
Base Volume Input [veh/h]	109	143	16	37	182	6	38	153	112	32	73	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	147	193	22	50	246	8	51	207	151	43	99	36
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	48	6	13	62	2	13	52	38	11	25	9
Total Analysis Volume [veh/h]	147	193	22	50	246	8	51	207	151	43	99	36
Pedestrian Volume [ped/h]	9			9			6			6		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	5.32	3.80	6.48	1.66
95th-Percentile Queue Length [ft]	133.08	94.95	161.93	41.44
Approach Delay [s/veh]	23.89	19.66	26.60	14.59
Approach LOS	C	C	D	B
Intersection Delay [s/veh]	22.43			
Intersection LOS	C			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	13.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	76	73	85	82	3	5	31	8	70	24	61
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	19	18	21	21	1	1	8	2	18	6	15
Total Analysis Volume [veh/h]	3	76	73	85	82	3	5	31	8	70	24	61
Pedestrian Volume [ped/h]	5			5			4			4		

Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.06	0.00	0.00	0.01	0.06	0.01	0.14	0.05	0.07
d_M, Delay for Movement [s/veh]	7.40	0.00	0.00	7.69	0.00	0.00	13.33	12.85	9.25	13.23	13.04	9.91
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.34	0.34	0.34	0.41	0.41	0.41	0.24	0.24	0.24	0.69	0.69	0.69
95th-Percentile Queue Length [ft]	8.44	8.44	8.44	10.16	10.16	10.16	6.00	6.00	6.00	17.16	17.16	17.16
d_A, Approach Delay [s/veh]	0.15			3.85			12.25			11.89		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	5.87											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	4	53	5	3	75	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	72	7	4	101	7
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	18	2	1	25	2
Total Analysis Volume [veh/h]	5	72	7	4	101	7
Pedestrian Volume [ped/h]	0		0		0	

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.07	0.00	0.00	0.06	0.00
d_M, Delay for Movement [s/veh]	10.27	8.63	0.00	0.00	7.39	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.24	0.24	0.00	0.00	0.22	0.22
95th-Percentile Queue Length [ft]	5.99	5.99	0.00	0.00	5.39	5.39
d_A, Approach Delay [s/veh]	8.74		0.00		6.91	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.24					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.015

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.00	1.35	1.35	1.00	1.35	1.00	1.35	1.35	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	0	28	186	0	14	0	11	211	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	0	7	47	0	4	0	3	53	0	0	0
Total Analysis Volume [veh/h]	30	0	28	186	0	14	0	11	211	0	0	0
Pedestrian Volume [ped/h]	0			0			11			11		

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Stop			Free			Stop			Free		
Flared Lane	Yes						No					
Storage Area [veh]	1			0			0			0		
Two-Stage Gap Acceptance	No						No					
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.20	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.26	0.00	9.47	0.00	0.00	0.00	0.00	10.83	9.34	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.13	0.00	0.13	0.00	0.00	0.00	0.00	0.81	0.81	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	3.35	0.00	3.35	0.00	0.00	0.00	0.00	20.28	20.28	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.88			0.00			9.42			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	5.55											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	13.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.193

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	160	93	68	25	18	129
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	216	126	92	34	24	174
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	54	32	23	9	6	44
Total Analysis Volume [veh/h]	216	126	92	34	24	174
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.19	0.04	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	13.89	11.06	7.86	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.71	0.71	0.54	0.54
95th-Percentile Queue Length [ft]	0.00	0.00	17.78	17.78	13.62	13.62
d_A, Approach Delay [s/veh]	0.00		13.12		0.95	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	2.77					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	88.0
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	280	155	170	243	307	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	378	209	230	328	414	244
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	95	52	58	82	104	61
Total Analysis Volume [veh/h]	378	209	230	328	414	244
Pedestrian Volume [ped/h]	147		0		0	

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	27.89	2.97	5.12	10.36	0.88	0.88
95th-Percentile Queue Length [ft]	697.24	74.22	128.03	258.88	22.02	22.02
Approach Delay [s/veh]	206.72	22.76		37.29		
Approach LOS	F	C		E		
Intersection Delay [s/veh]	87.96					
Intersection LOS	F					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	299.3
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.383

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	103	4	254	0	0	0	114	236	0	0	282	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.00	1.00	1.00	1.35	1.35	1.00	1.00	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	139	5	343	0	0	0	154	319	0	0	381	325
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	1	86	0	0	0	39	80	0	0	95	81
Total Analysis Volume [veh/h]	139	5	343	0	0	0	154	319	0	0	381	325
Pedestrian Volume [ped/h]	146			0			0			0		

Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	1.38	0.06	0.48	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	299.33	47.65	11.99	0.00	0.00	0.00	9.87	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	E	B				A	A			A	A
95th-Percentile Queue Length [veh]	10.02	1.20	1.07	0.00	0.00	0.00	0.62	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	250.38	29.96	26.73	0.00	0.00	0.00	15.54	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	94.37			0.00			3.22			0.00		
Approach LOS	F			A			A			A		
d_I, Intersection Delay [s/veh]	28.50											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	13.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	75	30	26	149	279	101	67	175	60	111	152	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	101	41	35	201	377	136	90	236	81	150	205	157
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	10	9	50	94	34	23	59	20	38	51	39
Total Analysis Volume [veh/h]	101	41	35	201	377	136	90	236	81	150	205	157
Pedestrian Volume [ped/h]	112			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.08	1.94	1.59	1.59	0.89	0.67	2.36	0.50	1.32	1.91	1.14
95th-Percentile Queue Length [ft]	26.96	48.42	39.73	39.73	22.16	16.81	59.02	12.39	33.03	47.84	28.44
Approach Delay [s/veh]	10.43	13.13				13.53			13.28		
Approach LOS	B	B				B			B		
Intersection Delay [s/veh]	13.00										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset PM Future

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	11	2.0	0.216	5.0	LOS A	1.1	27.1	0.37	0.23	23.0
8	T1	12	2.0	0.216	5.0	LOS A	1.1	27.1	0.37	0.23	23.1
18	R2	230	2.0	0.216	5.0	LOS A	1.1	27.1	0.37	0.23	22.8
Approach		253	2.0	0.216	5.0	LOS A	1.1	27.1	0.37	0.23	22.8
East: Sunset Ave											
1	L2	251	2.0	0.327	5.5	LOS A	2.0	50.5	0.14	0.04	22.7
6	T1	153	2.0	0.327	5.5	LOS A	2.0	50.5	0.14	0.04	22.7
16	R2	45	2.0	0.327	5.5	LOS A	2.0	50.5	0.14	0.04	22.5
Approach		449	2.0	0.327	5.5	LOS A	2.0	50.5	0.14	0.04	22.7
North: Jay Street											
7	L2	45	2.0	0.067	4.5	LOS A	0.3	7.0	0.48	0.37	22.8
4	T1	14	2.0	0.067	4.5	LOS A	0.3	7.0	0.48	0.37	22.9
14	R2	3	2.0	0.067	4.5	LOS A	0.3	7.0	0.48	0.37	22.6
Approach		62	2.0	0.067	4.5	LOS A	0.3	7.0	0.48	0.37	22.8
West: Sunset Ave											
5	L2	1	2.0	0.142	4.8	LOS A	0.6	16.1	0.45	0.33	23.2
2	T1	130	2.0	0.142	4.8	LOS A	0.6	16.1	0.45	0.33	23.3
12	R2	15	2.0	0.142	4.8	LOS A	0.6	16.1	0.45	0.33	23.0
Approach		146	2.0	0.142	4.8	LOS A	0.6	16.1	0.45	0.33	23.2
All Vehicles		910	2.0	0.327	5.2	LOS A	2.0	50.5	0.28	0.16	22.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	67.4
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	13	354	113	100	322	6	5	16	12	109	20	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	478	153	135	435	8	7	22	16	147	27	167
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	120	38	34	109	2	2	6	4	37	7	42
Total Analysis Volume [veh/h]	18	478	153	135	435	8	7	22	16	147	27	167
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	20.43	15.56	0.35	1.49	1.83
95th-Percentile Queue Length [ft]	510.74	388.91	8.77	37.13	45.71
Approach Delay [s/veh]	97.34	68.95	12.42	14.82	
Approach LOS	F	F	B	B	
Intersection Delay [s/veh]	67.35				
Intersection LOS	F				

APPENDIX T.1

Generated with PTV VISTRO

Version 4.00-02

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	10.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.006

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	3	37	41	3	56	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	50	55	4	76	49
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	13	14	1	19	12
Total Analysis Volume [veh/h]	4	50	55	4	76	49
Pedestrian Volume [ped/h]	0		0		0	

Generated with PTV VISTRO

Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.05	0.00	0.00	0.05	0.00
d_M, Delay for Movement [s/veh]	10.40	8.78	0.00	0.00	7.45	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.18	0.18	0.00	0.00	0.26	0.26
95th-Percentile Queue Length [ft]	4.38	4.38	0.00	0.00	6.59	6.59
d_A, Approach Delay [s/veh]	8.90		0.00		4.53	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.40					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	25.2
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.342

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	18	340	315	69	68	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	24	459	425	93	92	15
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	115	106	23	23	4
Total Analysis Volume [veh/h]	24	459	425	93	92	15
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.34	0.03
d_M, Delay for Movement [s/veh]	8.52	0.00	0.00	0.00	25.20	11.24
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh]	2.48	2.48	0.00	0.00	1.46	0.08
95th-Percentile Queue Length [ft]	61.95	61.95	0.00	0.00	36.59	1.95
d_A, Approach Delay [s/veh]	0.42		0.00		23.24	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	2.43					
Intersection LOS	D					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	73.6
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name				K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name				K St			11th St			11th St		
Base Volume Input [veh/h]	96	283	37	54	233	7	21	104	84	52	121	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	130	382	50	73	315	9	28	140	113	70	163	62
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	96	13	18	79	2	7	35	28	18	41	16
Total Analysis Volume [veh/h]	130	382	50	73	315	9	28	140	113	70	163	62
Pedestrian Volume [ped/h]	17			18			5			12		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	22.13	9.16	4.45	5.00
95th-Percentile Queue Length [ft]	553.18	228.88	111.30	125.05
Approach Delay [s/veh]	141.85	45.33	25.20	27.47
Approach LOS	F	E	D	D
Intersection Delay [s/veh]	73.55			
Intersection LOS	F			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	11.6
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	66	66	39	32	1	1	34	9	63	39	78
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	17	17	10	8	0	0	9	2	16	10	20
Total Analysis Volume [veh/h]	5	66	66	39	32	1	1	34	9	63	39	78
Pedestrian Volume [ped/h]	4			3			3			7		

Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.06	0.01	0.10	0.06	0.08
d_M, Delay for Movement [s/veh]	7.30	0.00	0.00	7.58	0.00	0.00	11.63	11.12	8.79	11.19	11.20	9.44
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.29	0.29	0.29	0.16	0.16	0.16	0.18	0.18	0.18	0.56	0.56	0.56
95th-Percentile Queue Length [ft]	7.16	7.16	7.16	3.96	3.96	3.96	4.52	4.52	4.52	14.07	14.07	14.07
d_A, Approach Delay [s/veh]	0.27			4.11			10.65			10.44		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	6.19											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.3
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.017

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	11	26	9	3	28	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	35	12	4	38	14
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	9	3	1	10	4
Total Analysis Volume [veh/h]	15	35	12	4	38	14
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.03	0.00	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	9.32	8.57	0.00	0.00	7.30	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.16	0.16	0.00	0.00	0.10	0.10
95th-Percentile Queue Length [ft]	3.94	3.94	0.00	0.00	2.52	2.52
d_A, Approach Delay [s/veh]	8.79		0.00		5.34	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.08					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	11.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.046

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.00	1.35	1.35	1.00	1.35	1.00	1.35	1.35	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	15	0	83	0	0	4	0	20	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	0	90	248	0	12	0	31	134	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	0	23	62	0	3	0	8	34	0	0	0
Total Analysis Volume [veh/h]	22	0	90	248	0	12	0	31	134	0	0	0
Pedestrian Volume [ped/h]	0			0			9			9		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.12	0.00	0.00	0.00	0.00	0.05	0.13	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	11.05	0.00	10.18	0.00	0.00	0.00	0.00	11.10	9.16	0.00	0.00	0.00
Movement LOS	B		B	A		A		B	A			
95th-Percentile Queue Length [veh]	0.40	0.00	0.40	0.00	0.00	0.00	0.00	0.62	0.62	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	9.90	0.00	9.90	0.00	0.00	0.00	0.00	15.47	15.47	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.35			0.00			9.53			0.00		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	5.09											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	15.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.254

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	87	27	89	19	8	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	20	0	0	0	0	83
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	137	36	120	26	11	327
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	34	9	30	7	3	82
Total Analysis Volume [veh/h]	137	36	120	26	11	327
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.25	0.03	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	15.04	11.45	7.55	0.00
Movement LOS	A	A	C	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	1.08	1.08	0.93	0.93
95th-Percentile Queue Length [ft]	0.00	0.00	26.90	26.90	23.16	23.16
d_A, Approach Delay [s/veh]	0.00		14.40		0.25	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	3.33					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	19.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	95	95	183	225	158	392
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	18	73	10	2	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	128	146	320	314	215	529
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	37	80	79	54	132
Total Analysis Volume [veh/h]	128	146	320	314	215	529
Pedestrian Volume [ped/h]	75		0		0	

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.36	5.07	4.01	2.40	2.58	2.58
95th-Percentile Queue Length [ft]	109.12	126.72	100.32	59.98	64.49	64.49
Approach Delay [s/veh]	25.28	22.62		15.63		
Approach LOS	D	C		C		
Intersection Delay [s/veh]	19.92					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	117.0
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.856

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	74	0	118	0	0	0	93	430	0	0	251	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.00	1.00	1.00	1.35	1.35	1.00	1.00	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	2	0	0	0	0	0	0	0	10	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	100	0	161	0	0	0	126	581	0	0	349	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	0	40	0	0	0	32	145	0	0	87	23
Total Analysis Volume [veh/h]	100	0	161	0	0	0	126	581	0	0	349	90
Pedestrian Volume [ped/h]	75			0			0			0		

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.86	0.00	0.31	0.00	0.00	0.00	0.11	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	116.96	35.22	13.31	0.00	0.00	0.00	8.62	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	E	B				A	A			A	A
95th-Percentile Queue Length [veh]	5.16	0.55	0.55	0.00	0.00	0.00	0.38	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	128.98	13.80	13.80	0.00	0.00	0.00	9.47	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	53.02			0.00			1.54			0.00		
Approach LOS	F			A			A			A		
d_I, Intersection Delay [s/veh]	10.61											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	20.2
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	35	7	11	311	391	190	128	201	46	90	123	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	10
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	47	9	15	420	528	257	173	271	62	122	166	161
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	2	4	105	132	64	43	68	16	31	42	40
Total Analysis Volume [veh/h]	47	9	15	420	528	257	173	271	62	122	166	161
Pedestrian Volume [ped/h]	60			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.38	8.78	2.78	2.78	2.24	1.87	3.72	0.42	1.19	1.71	1.46
95th-Percentile Queue Length [ft]	9.42	219.6	69.39	69.39	55.99	46.82	92.97	10.54	29.75	42.76	36.41
Approach Delay [s/veh]	9.40	23.65				18.25			14.76		
Approach LOS	A	C				C			B		
Intersection Delay [s/veh]	20.18										
Intersection LOS	C										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset AM Future + The Village

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	35	2.0	0.255	5.8	LOS A	1.3	32.1	0.46	0.34	22.8
8	T1	1	2.0	0.255	5.8	LOS A	1.3	32.1	0.46	0.34	22.8
18	R2	238	2.0	0.255	5.8	LOS A	1.3	32.1	0.46	0.34	22.6
Approach		274	2.0	0.255	5.8	LOS A	1.3	32.1	0.46	0.34	22.6
East: Sunset Ave											
1	L2	247	2.0	0.347	5.8	LOS A	2.1	54.6	0.19	0.07	22.7
6	T1	216	2.0	0.347	5.8	LOS A	2.1	54.6	0.19	0.07	22.7
16	R2	7	2.0	0.347	5.8	LOS A	2.1	54.6	0.19	0.07	22.4
Approach		470	2.0	0.347	5.8	LOS A	2.1	54.6	0.19	0.07	22.7
North: Jay Street											
7	L2	32	2.0	0.047	4.7	LOS A	0.2	4.8	0.52	0.40	22.7
4	T1	7	2.0	0.047	4.7	LOS A	0.2	4.8	0.52	0.40	22.8
14	R2	1	2.0	0.047	4.7	LOS A	0.2	4.8	0.52	0.40	22.5
Approach		40	2.0	0.047	4.7	LOS A	0.2	4.8	0.52	0.40	22.7
West: Sunset Ave											
5	L2	1	2.0	0.232	5.6	LOS A	1.1	28.6	0.47	0.35	23.0
2	T1	230	2.0	0.232	5.6	LOS A	1.1	28.6	0.47	0.35	23.1
12	R2	14	2.0	0.232	5.6	LOS A	1.1	28.6	0.47	0.35	22.8
Approach		245	2.0	0.232	5.6	LOS A	1.1	28.6	0.47	0.35	23.1
All Vehicles		1029	2.0	0.347	5.7	LOS A	2.1	54.6	0.34	0.22	22.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	40.4
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	3	232	116	120	290	3	5	11	8	185	5	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	4	0	0	15	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	317	157	162	407	4	7	15	11	250	7	88
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	79	39	41	102	1	2	4	3	63	2	22
Total Analysis Volume [veh/h]	4	317	157	162	407	4	7	15	11	250	7	88
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	8.34	14.77	0.24	3.34	0.66
95th-Percentile Queue Length [ft]	208.61	369.26	6.07	83.60	16.49
Approach Delay [s/veh]	31.25	63.35	11.88	17.88	
Approach LOS	D	F	B	C	
Intersection Delay [s/veh]	40.44				
Intersection LOS	E				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	13.5
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	1	83	57	3	122	80
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	112	77	4	165	108
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	28	19	1	41	27
Total Analysis Volume [veh/h]	1	112	77	4	165	108
Pedestrian Volume [ped/h]	9		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.12	0.00	0.00	0.11	0.00
d_M, Delay for Movement [s/veh]	13.55	9.25	0.00	0.00	7.71	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.40	0.40	0.00	0.00	0.67	0.67
95th-Percentile Queue Length [ft]	10.06	10.06	0.00	0.00	16.72	16.72
d_A, Approach Delay [s/veh]	9.29		0.00		4.66	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.97					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	35.6
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.594

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	21	247	321	173	121	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	4	15	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	337	448	234	163	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	84	112	59	41	7
Total Analysis Volume [veh/h]	28	337	448	234	163	27
Pedestrian Volume [ped/h]	0		0		0	

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.00	0.00	0.59	0.05
d_M, Delay for Movement [s/veh]	9.08	0.00	0.00	0.00	35.60	12.24
Movement LOS	A	A	A	A	E	B
95th-Percentile Queue Length [veh]	1.95	1.95	0.00	0.00	3.50	0.16
95th-Percentile Queue Length [ft]	48.76	48.76	0.00	0.00	87.59	4.06
d_A, Approach Delay [s/veh]	0.70		0.00		32.28	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	5.16					
Intersection LOS	E					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	23.6
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	K St			K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	K St			K St			11th St			11th St		
Base Volume Input [veh/h]	109	143	16	37	182	6	38	153	112	32	73	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	4	0	0	15	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	147	197	22	50	261	8	51	207	151	43	99	36
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	49	6	13	65	2	13	52	38	11	25	9
Total Analysis Volume [veh/h]	147	197	22	50	261	8	51	207	151	43	99	36
Pedestrian Volume [ped/h]	9			9			6			6		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	5.62	4.27	6.72	1.70
95th-Percentile Queue Length [ft]	140.50	106.75	168.02	42.58
Approach Delay [s/veh]	25.17	21.21	27.88	14.94
Approach LOS	D	C	D	B
Intersection Delay [s/veh]	23.62			
Intersection LOS	C			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	13.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	76	73	85	82	3	5	31	8	70	24	61
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	19	18	21	21	1	1	8	2	18	6	15
Total Analysis Volume [veh/h]	3	76	73	85	82	3	5	31	8	70	24	61
Pedestrian Volume [ped/h]	5			5			4			4		

Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.06	0.00	0.00	0.01	0.06	0.01	0.14	0.05	0.07
d_M, Delay for Movement [s/veh]	7.40	0.00	0.00	7.69	0.00	0.00	13.33	12.85	9.25	13.23	13.04	9.91
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.34	0.34	0.34	0.41	0.41	0.41	0.24	0.24	0.24	0.69	0.69	0.69
95th-Percentile Queue Length [ft]	8.44	8.44	8.44	10.16	10.16	10.16	6.00	6.00	6.00	17.16	17.16	17.16
d_A, Approach Delay [s/veh]	0.15			3.85			12.25			11.89		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	5.87											
Intersection LOS	B											

APPENDIX T.1

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Version 4.00-02

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	4	53	5	3	75	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	72	7	4	101	7
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	18	2	1	25	2
Total Analysis Volume [veh/h]	5	72	7	4	101	7
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.07	0.00	0.00	0.06	0.00
d_M, Delay for Movement [s/veh]	10.27	8.63	0.00	0.00	7.39	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.24	0.24	0.00	0.00	0.22	0.22
95th-Percentile Queue Length [ft]	5.99	5.99	0.00	0.00	5.39	5.39
d_A, Approach Delay [s/veh]	8.74		0.00		6.91	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.24					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	11.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.132

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.00	1.35	1.35	1.00	1.35	1.00	1.35	1.35	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	0	44	0	0	15	0	84	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	0	72	186	0	29	0	95	211	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	0	18	47	0	7	0	24	53	0	0	0
Total Analysis Volume [veh/h]	38	0	72	186	0	29	0	95	211	0	0	0
Pedestrian Volume [ped/h]	0			0			11			11		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.00	0.09	0.00	0.00	0.00	0.00	0.13	0.20	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.46	0.00	9.67	0.00	0.00	0.00	0.00	11.91	10.32	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	B			
95th-Percentile Queue Length [veh]	0.29	0.00	0.29	0.00	0.00	0.00	0.00	1.46	1.46	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	7.21	0.00	7.21	0.00	0.00	0.00	0.00	36.45	36.45	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.94			0.00			10.81			0.00		
Approach LOS	A			A			B			A		
d_I, Intersection Delay [s/veh]	6.98											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	15.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.229

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	160	93	68	25	18	129
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	84	0	0	0	0	44
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	300	126	92	34	24	218
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	75	32	23	9	6	55
Total Analysis Volume [veh/h]	300	126	92	34	24	218
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.23	0.05	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	15.91	12.22	8.07	0.00
Movement LOS	A	A	C	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.88	0.88	0.76	0.76
95th-Percentile Queue Length [ft]	0.00	0.00	21.95	21.95	18.91	18.91
d_A, Approach Delay [s/veh]	0.00		14.92		0.80	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	2.61					
Intersection LOS	C					

APPENDIX T.1

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Version 4.00-02

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	122.3
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	280	155	170	243	307	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	74	39	5	10	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	378	283	269	333	424	244
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	95	71	67	83	106	61
Total Analysis Volume [veh/h]	378	283	269	333	424	244
Pedestrian Volume [ped/h]	147		0		0	

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Version 4.00-02

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	36.94	4.04	5.36	11.20	0.89	0.89
95th-Percentile Queue Length [ft]	923.46	101.08	134.12	280.03	22.25	22.25
Approach Delay [s/veh]	292.86	24.81		41.33		
Approach LOS	F	C		E		
Intersection Delay [s/veh]	122.28					
Intersection LOS	F					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	304.8
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.395

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	103	4	254	0	0	0	114	236	0	0	282	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.00	1.00	1.00	1.35	1.35	1.00	1.00	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	10	0	0	0	0	0	0	0	5	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	139	5	353	0	0	0	154	319	0	0	386	325
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	1	88	0	0	0	39	80	0	0	97	81
Total Analysis Volume [veh/h]	139	5	353	0	0	0	154	319	0	0	386	325
Pedestrian Volume [ped/h]	146			0			0			0		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No			
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	1.39	0.06	0.49	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	304.81	48.05	12.06	0.00	0.00	0.00	9.90	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	E	B				A	A			A	A
95th-Percentile Queue Length [veh]	10.09	1.24	1.11	0.00	0.00	0.00	0.62	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	252.16	31.02	27.70	0.00	0.00	0.00	15.62	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	94.30			0.00			3.22			0.00		
Approach LOS	F			A			A			A		
d_I, Intersection Delay [s/veh]	28.79											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	13.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	75	30	26	149	279	101	67	175	60	111	152	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	101	41	35	201	377	136	90	236	81	150	205	162
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	10	9	50	94	34	23	59	20	38	51	41
Total Analysis Volume [veh/h]	101	41	35	201	377	136	90	236	81	150	205	162
Pedestrian Volume [ped/h]	112			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.08	1.94	1.59	1.59	0.89	0.67	2.36	0.50	1.32	1.91	1.19
95th-Percentile Queue Length [ft]	26.88	48.47	39.78	39.78	22.18	16.81	59.03	12.39	33.03	47.84	29.68
Approach Delay [s/veh]	10.41	13.14				13.53			13.30		
Approach LOS	B	B				B			B		
Intersection Delay [s/veh]	13.01										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset PM Future + The Village

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	11	2.0	0.216	5.0	LOS A	1.1	27.1	0.37	0.23	23.0
8	T1	12	2.0	0.216	5.0	LOS A	1.1	27.1	0.37	0.23	23.1
18	R2	230	2.0	0.216	5.0	LOS A	1.1	27.1	0.37	0.23	22.8
Approach		253	2.0	0.216	5.0	LOS A	1.1	27.1	0.37	0.23	22.8
East: Sunset Ave											
1	L2	251	2.0	0.327	5.5	LOS A	2.0	50.5	0.14	0.04	22.7
6	T1	153	2.0	0.327	5.5	LOS A	2.0	50.5	0.14	0.04	22.7
16	R2	45	2.0	0.327	5.5	LOS A	2.0	50.5	0.14	0.04	22.5
Approach		449	2.0	0.327	5.5	LOS A	2.0	50.5	0.14	0.04	22.7
North: Jay Street											
7	L2	45	2.0	0.067	4.5	LOS A	0.3	7.0	0.48	0.37	22.8
4	T1	14	2.0	0.067	4.5	LOS A	0.3	7.0	0.48	0.37	22.9
14	R2	3	2.0	0.067	4.5	LOS A	0.3	7.0	0.48	0.37	22.6
Approach		62	2.0	0.067	4.5	LOS A	0.3	7.0	0.48	0.37	22.8
West: Sunset Ave											
5	L2	1	2.0	0.142	4.8	LOS A	0.6	16.1	0.45	0.33	23.2
2	T1	130	2.0	0.142	4.8	LOS A	0.6	16.1	0.45	0.33	23.3
12	R2	15	2.0	0.142	4.8	LOS A	0.6	16.1	0.45	0.33	23.0
Approach		146	2.0	0.142	4.8	LOS A	0.6	16.1	0.45	0.33	23.2
All Vehicles		910	2.0	0.327	5.2	LOS A	2.0	50.5	0.28	0.16	22.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	73.1
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	13	354	113	100	322	6	5	16	12	109	20	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	0	0	8	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	493	153	135	443	8	7	22	16	147	27	167
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	123	38	34	111	2	2	6	4	37	7	42
Total Analysis Volume [veh/h]	18	493	153	135	443	8	7	22	16	147	27	167
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	21.88	16.23	0.35	1.49	1.83
95th-Percentile Queue Length [ft]	547.07	405.75	8.78	37.14	45.72
Approach Delay [s/veh]	107.08	73.21	12.43	14.82	
Approach LOS	F	F	B	B	
Intersection Delay [s/veh]	73.12				
Intersection LOS	F				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	10.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.006

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	3	37	41	3	56	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	50	55	4	76	49
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	13	14	1	19	12
Total Analysis Volume [veh/h]	4	50	55	4	76	49
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.05	0.00	0.00	0.05	0.00
d_M, Delay for Movement [s/veh]	10.40	8.78	0.00	0.00	7.45	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.18	0.18	0.00	0.00	0.26	0.26
95th-Percentile Queue Length [ft]	4.38	4.38	0.00	0.00	6.59	6.59
d_A, Approach Delay [s/veh]	8.90		0.00		4.53	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.40					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	26.2
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.353

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	18	340	315	69	68	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	8	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	24	474	433	93	92	15
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	119	108	23	23	4
Total Analysis Volume [veh/h]	24	474	433	93	92	15
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.35	0.03
d_M, Delay for Movement [s/veh]	8.54	0.00	0.00	0.00	26.20	11.30
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh]	2.65	2.65	0.00	0.00	1.53	0.08
95th-Percentile Queue Length [ft]	66.22	66.22	0.00	0.00	38.21	1.97
d_A, Approach Delay [s/veh]	0.41		0.00		24.11	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	2.46					
Intersection LOS	D					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	81.1
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name				K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name				K St			11th St			11th St		
Base Volume Input [veh/h]	96	283	37	54	233	7	21	104	84	52	121	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	0	0	8	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	130	397	50	73	323	9	28	140	113	70	163	62
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	99	13	18	81	2	7	35	28	18	41	16
Total Analysis Volume [veh/h]	130	397	50	73	323	9	28	140	113	70	163	62
Pedestrian Volume [ped/h]	17			18			5			12		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	23.94	9.70	4.51	5.06
95th-Percentile Queue Length [ft]	598.44	242.48	112.69	126.60
Approach Delay [s/veh]	158.27	48.60	25.56	27.88
Approach LOS	F	E	D	D
Intersection Delay [s/veh]	81.14			
Intersection LOS	F			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	11.6
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	66	66	39	32	1	1	34	9	63	39	78
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	17	17	10	8	0	0	9	2	16	10	20
Total Analysis Volume [veh/h]	5	66	66	39	32	1	1	34	9	63	39	78
Pedestrian Volume [ped/h]	4			3			3			7		

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Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.06	0.01	0.10	0.06	0.08
d_M, Delay for Movement [s/veh]	7.30	0.00	0.00	7.58	0.00	0.00	11.63	11.12	8.79	11.19	11.20	9.44
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.29	0.29	0.29	0.16	0.16	0.16	0.18	0.18	0.18	0.56	0.56	0.56
95th-Percentile Queue Length [ft]	7.16	7.16	7.16	3.96	3.96	3.96	4.52	4.52	4.52	14.07	14.07	14.07
d_A, Approach Delay [s/veh]	0.27			4.11			10.65			10.44		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	6.19											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.3
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.017

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	11	26	9	3	28	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	35	12	4	38	14
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	9	3	1	10	4
Total Analysis Volume [veh/h]	15	35	12	4	38	14
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.03	0.00	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	9.32	8.57	0.00	0.00	7.30	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.16	0.16	0.00	0.00	0.10	0.10
95th-Percentile Queue Length [ft]	3.94	3.94	0.00	0.00	2.52	2.52
d_A, Approach Delay [s/veh]	8.79		0.00		5.34	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.08					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 13: Foster Avenue/ Creekside Prj Driveway

Control Type:	Two-way stop	Delay (sec / veh):	9.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	0	0	0	40	38	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	54	51	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	14	13	0
Total Analysis Volume [veh/h]	0	0	0	54	51	0
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.03	8.54	7.31	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	8.79		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

APPENDIX T.1

Generated with PTV VISTRO

Version 4.00-02

Intersection Level Of Service Report

Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.016

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.00	1.35	1.35	1.00	1.35	1.00	1.35	1.35	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	0	7	248	0	8	0	11	134	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	0	2	62	0	2	0	3	34	0	0	0
Total Analysis Volume [veh/h]	7	0	7	248	0	8	0	11	134	0	0	0
Pedestrian Volume [ped/h]	0			0			9			9		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.13	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.57	0.00	9.70	0.00	0.00	0.00	0.00	10.88	8.97	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.49	0.49	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.82	0.00	0.82	0.00	0.00	0.00	0.00	12.37	12.37	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.14			0.00			9.11			0.00		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	3.53											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	13.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.222

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	87	27	89	19	8	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	117	36	120	26	11	244
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	9	30	7	3	61
Total Analysis Volume [veh/h]	117	36	120	26	11	244
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.22	0.03	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	13.23	10.50	7.50	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.85	0.85	0.64	0.64
95th-Percentile Queue Length [ft]	0.00	0.00	21.16	21.16	15.94	15.94
d_A, Approach Delay [s/veh]	0.00		12.74		0.32	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	3.51					
Intersection LOS	B					

APPENDIX T.1

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Version 4.00-02

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	17.2
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	95	95	183	225	158	392
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	0	0	0	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	130	128	247	304	213	537
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	32	62	76	53	134
Total Analysis Volume [veh/h]	130	128	247	304	213	537
Pedestrian Volume [ped/h]	75		0		0	

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Version 4.00-02

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.64	2.92	3.62	2.24	2.49	2.49
95th-Percentile Queue Length [ft]	90.97	72.97	90.47	56.10	62.14	62.14
Approach Delay [s/veh]	21.98	18.25		14.88		
Approach LOS	C	C		B		
Intersection Delay [s/veh]	17.25					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	124.0
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.882

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	74	0	118	0	0	0	93	430	0	0	251	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.00	1.00	1.00	1.35	1.35	1.00	1.00	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	0	0	0	0	0	3	8	0	0	2	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	102	0	159	0	0	0	129	589	0	0	341	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	0	40	0	0	0	32	147	0	0	85	23
Total Analysis Volume [veh/h]	102	0	159	0	0	0	129	589	0	0	341	90
Pedestrian Volume [ped/h]	75			0			0			0		

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No			
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.88	0.00	0.31	0.00	0.00	0.00	0.11	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	124.02	35.53	13.39	0.00	0.00	0.00	8.60	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	E	B				A	A			A	A
95th-Percentile Queue Length [veh]	5.39	0.55	0.55	0.00	0.00	0.00	0.39	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	134.85	13.77	13.77	0.00	0.00	0.00	9.65	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	56.63			0.00			1.55			0.00		
Approach LOS	F			A			A			A		
d_I, Intersection Delay [s/veh]	11.27											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	20.6
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	35	7	11	311	391	190	128	201	46	90	123	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	0	0	0	0	1	8	11	5	0	4	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	48	9	15	420	528	258	181	282	67	122	170	151
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	2	4	105	132	65	45	71	17	31	43	38
Total Analysis Volume [veh/h]	48	9	15	420	528	258	181	282	67	122	170	151
Pedestrian Volume [ped/h]	60			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.38	8.89	2.80	2.80	2.28	2.02	4.05	0.46	1.20	1.80	1.35
95th-Percentile Queue Length [ft]	9.55	222.1	70.05	70.05	56.91	50.43	101.18	11.55	30.08	44.90	33.69
Approach Delay [s/veh]	9.40	23.99				18.99			14.90		
Approach LOS	A	C				C			B		
Intersection Delay [s/veh]	20.56										
Intersection LOS	C										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset AM Future + Canyon Creek

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	35	2.0	0.262	6.0	LOS A	1.3	32.8	0.48	0.37	22.8
8	T1	1	2.0	0.262	6.0	LOS A	1.3	32.8	0.48	0.37	22.8
18	R2	238	2.0	0.262	6.0	LOS A	1.3	32.8	0.48	0.37	22.5
Approach		274	2.0	0.262	6.0	LOS A	1.3	32.8	0.48	0.37	22.6
East: Sunset Ave											
1	L2	247	2.0	0.351	5.8	LOS A	2.2	55.6	0.19	0.07	22.7
6	T1	216	2.0	0.351	5.8	LOS A	2.2	55.6	0.19	0.07	22.7
16	R2	13	2.0	0.351	5.8	LOS A	2.2	55.6	0.19	0.07	22.4
Approach		476	2.0	0.351	5.8	LOS A	2.2	55.6	0.19	0.07	22.7
North: Jay Street											
7	L2	56	2.0	0.085	5.1	LOS A	0.3	8.8	0.53	0.44	22.7
4	T1	15	2.0	0.085	5.1	LOS A	0.3	8.8	0.53	0.44	22.7
14	R2	1	2.0	0.085	5.1	LOS A	0.3	8.8	0.53	0.44	22.4
Approach		72	2.0	0.085	5.1	LOS A	0.3	8.8	0.53	0.44	22.7
West: Sunset Ave											
5	L2	1	2.0	0.240	5.8	LOS A	1.2	29.4	0.49	0.39	23.0
2	T1	230	2.0	0.240	5.8	LOS A	1.2	29.4	0.49	0.39	23.0
12	R2	14	2.0	0.240	5.8	LOS A	1.2	29.4	0.49	0.39	22.8
Approach		245	2.0	0.240	5.8	LOS A	1.2	29.4	0.49	0.39	23.0
All Vehicles		1067	2.0	0.351	5.8	LOS A	2.2	55.6	0.36	0.24	22.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	39.6
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	3	232	116	120	290	3	5	11	8	185	5	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	1	1	0	0	0	0	0	5	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	313	158	163	392	4	7	15	11	255	7	91
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	78	40	41	98	1	2	4	3	64	2	23
Total Analysis Volume [veh/h]	4	313	158	163	392	4	7	15	11	255	7	91
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	8.66	14.04	0.25	3.60	0.70
95th-Percentile Queue Length [ft]	216.40	350.92	6.29	90.05	17.49
Approach Delay [s/veh]	33.18	59.73	12.19	18.83	
Approach LOS	D	F	B	C	
Intersection Delay [s/veh]	39.58				
Intersection LOS	E				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	13.5
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	1	83	57	3	122	80
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	112	77	4	165	108
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	28	19	1	41	27
Total Analysis Volume [veh/h]	1	112	77	4	165	108
Pedestrian Volume [ped/h]	9		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.12	0.00	0.00	0.11	0.00
d_M, Delay for Movement [s/veh]	13.55	9.25	0.00	0.00	7.71	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.40	0.40	0.00	0.00	0.67	0.67
95th-Percentile Queue Length [ft]	10.06	10.06	0.00	0.00	16.72	16.72
d_A, Approach Delay [s/veh]	9.29		0.00		4.66	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.97					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	34.4
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.583

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	21	247	321	173	121	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	5	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	334	438	234	163	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	84	110	59	41	7
Total Analysis Volume [veh/h]	28	334	438	234	163	27
Pedestrian Volume [ped/h]	0		0		0	

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.00	0.00	0.58	0.05
d_M, Delay for Movement [s/veh]	9.04	0.00	0.00	0.00	34.42	12.14
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh]	1.90	1.90	0.00	0.00	3.40	0.16
95th-Percentile Queue Length [ft]	47.48	47.48	0.00	0.00	85.02	4.01
d_A, Approach Delay [s/veh]	0.70		0.00		31.25	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	5.06					
Intersection LOS	D					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	22.8
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	K St			K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	K St			K St			11th St			11th St		
Base Volume Input [veh/h]	109	143	16	37	182	6	38	153	112	32	73	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	5	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	147	194	22	50	251	8	51	207	151	43	99	36
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	49	6	13	63	2	13	52	38	11	25	9
Total Analysis Volume [veh/h]	147	194	22	50	251	8	51	207	151	43	99	36
Pedestrian Volume [ped/h]	9			9			6			6		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	5.41	3.95	6.55	1.67
95th-Percentile Queue Length [ft]	135.17	98.67	163.82	41.80
Approach Delay [s/veh]	24.26	20.14	27.00	14.70
Approach LOS	C	C	D	B
Intersection Delay [s/veh]	22.78			
Intersection LOS	C			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	13.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	76	73	85	82	3	5	31	8	70	24	61
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	19	18	21	21	1	1	8	2	18	6	15
Total Analysis Volume [veh/h]	3	76	73	85	82	3	5	31	8	70	24	61
Pedestrian Volume [ped/h]	5			5			4			4		

Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.06	0.00	0.00	0.01	0.06	0.01	0.14	0.05	0.07
d_M, Delay for Movement [s/veh]	7.40	0.00	0.00	7.69	0.00	0.00	13.33	12.85	9.25	13.23	13.04	9.91
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.34	0.34	0.34	0.41	0.41	0.41	0.24	0.24	0.24	0.69	0.69	0.69
95th-Percentile Queue Length [ft]	8.44	8.44	8.44	10.16	10.16	10.16	6.00	6.00	6.00	17.16	17.16	17.16
d_A, Approach Delay [s/veh]	0.15			3.85			12.25			11.89		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	5.87											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	4	53	5	3	75	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	72	7	4	101	7
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	18	2	1	25	2
Total Analysis Volume [veh/h]	5	72	7	4	101	7
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.07	0.00	0.00	0.06	0.00
d_M, Delay for Movement [s/veh]	10.27	8.63	0.00	0.00	7.39	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.24	0.24	0.00	0.00	0.22	0.22
95th-Percentile Queue Length [ft]	5.99	5.99	0.00	0.00	5.39	5.39
d_A, Approach Delay [s/veh]	8.74		0.00		6.91	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.24					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 13: Foster Ave/ Project Driveway

Control Type:	Two-way stop	Delay (sec / veh):	9.5
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	0	0	0	58	81	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	78	109	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	20	27	0
Total Analysis Volume [veh/h]	0	0	0	78	109	0
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.49	8.81	7.43	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.15		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.015

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.00	1.35	1.35	1.00	1.35	1.00	1.35	1.35	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	0	28	186	0	14	0	11	211	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	0	7	47	0	4	0	3	53	0	0	0
Total Analysis Volume [veh/h]	30	0	28	186	0	14	0	11	211	0	0	0
Pedestrian Volume [ped/h]	0			0			11			11		

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Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.20	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.26	0.00	9.47	0.00	0.00	0.00	0.00	10.83	9.34	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.13	0.00	0.13	0.00	0.00	0.00	0.00	0.81	0.81	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	3.35	0.00	3.35	0.00	0.00	0.00	0.00	20.28	20.28	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.88			0.00			9.42			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	5.55											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	13.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.193

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	160	93	68	25	18	129
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	216	126	92	34	24	174
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	54	32	23	9	6	44
Total Analysis Volume [veh/h]	216	126	92	34	24	174
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.19	0.04	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	13.89	11.06	7.86	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.71	0.71	0.54	0.54
95th-Percentile Queue Length [ft]	0.00	0.00	17.78	17.78	13.62	13.62
d_A, Approach Delay [s/veh]	0.00		13.12		0.95	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	2.77					
Intersection LOS	B					

APPENDIX T.1

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Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	91.9
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	280	155	170	243	307	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	10	0	0	0	0	5
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	388	209	230	328	414	249
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	97	52	58	82	104	62
Total Analysis Volume [veh/h]	388	209	230	328	414	249
Pedestrian Volume [ped/h]	147		0		0	

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	29.03	2.97	5.13	10.36	0.90	0.90
95th-Percentile Queue Length [ft]	725.65	74.34	128.28	258.93	22.60	22.60
Approach Delay [s/veh]	217.18	22.81		37.13		
Approach LOS	F	C		E		
Intersection Delay [s/veh]	91.86					
Intersection LOS	F					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	361.8
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.533

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	103	4	254	0	0	0	114	236	0	0	282	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.00	1.00	1.00	1.35	1.35	1.00	1.00	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	10	0	0	0	0	0	2	5	0	0	10	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	149	5	343	0	0	0	156	324	0	0	391	325
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	1	86	0	0	0	39	81	0	0	98	81
Total Analysis Volume [veh/h]	149	5	343	0	0	0	156	324	0	0	391	325
Pedestrian Volume [ped/h]	146			0			0			0		

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Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	1.53	0.06	0.48	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	361.81	48.99	12.06	0.00	0.00	0.00	9.94	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	E	B				A	A			A	A
95th-Percentile Queue Length [veh]	11.38	1.22	1.08	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	284.60	30.42	27.06	0.00	0.00	0.00	15.95	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	117.29			0.00			3.23			0.00		
Approach LOS	F			A			A			A		
d_I, Intersection Delay [s/veh]	35.35											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	13.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	75	30	26	149	279	101	67	175	60	111	152	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	6	0	0	0	0	4	5	7	3	0	20	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	107	41	35	201	377	140	95	243	84	150	225	157
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	10	9	50	94	35	24	61	21	38	56	39
Total Analysis Volume [veh/h]	107	41	35	201	377	140	95	243	84	150	225	157
Pedestrian Volume [ped/h]	112			0			0			0		

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.11	1.96	1.61	1.61	0.93	0.72	2.50	0.52	1.33	2.23	1.14
95th-Percentile Queue Length [ft]	27.72	49.06	40.28	40.28	23.31	18.05	62.54	13.01	33.14	55.79	28.58
Approach Delay [s/veh]	10.39	13.28				13.82			13.71		
Approach LOS	B	B				B			B		
Intersection Delay [s/veh]	13.24										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset PM Future +Canyon Creek

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	11	2.0	0.228	5.2	LOS A	1.1	28.7	0.39	0.25	23.0
8	T1	22	2.0	0.228	5.2	LOS A	1.1	28.7	0.39	0.25	23.0
18	R2	230	2.0	0.228	5.2	LOS A	1.1	28.7	0.39	0.25	22.8
Approach		263	2.0	0.228	5.2	LOS A	1.1	28.7	0.39	0.25	22.8
East: Sunset Ave											
1	L2	251	2.0	0.352	5.8	LOS A	2.2	56.0	0.18	0.06	22.6
6	T1	153	2.0	0.352	5.8	LOS A	2.2	56.0	0.18	0.06	22.7
16	R2	75	2.0	0.352	5.8	LOS A	2.2	56.0	0.18	0.06	22.4
Approach		479	2.0	0.352	5.8	LOS A	2.2	56.0	0.18	0.06	22.6
North: Jay Street											
7	L2	60	2.0	0.089	4.7	LOS A	0.4	9.4	0.49	0.39	22.8
4	T1	19	2.0	0.089	4.7	LOS A	0.4	9.4	0.49	0.39	22.8
14	R2	3	2.0	0.089	4.7	LOS A	0.4	9.4	0.49	0.39	22.5
Approach		82	2.0	0.089	4.7	LOS A	0.4	9.4	0.49	0.39	22.8
West: Sunset Ave											
5	L2	1	2.0	0.145	4.9	LOS A	0.6	16.3	0.46	0.35	23.2
2	T1	130	2.0	0.145	4.9	LOS A	0.6	16.3	0.46	0.35	23.2
12	R2	15	2.0	0.145	4.9	LOS A	0.6	16.3	0.46	0.35	23.0
Approach		146	2.0	0.145	4.9	LOS A	0.6	16.3	0.46	0.35	23.2
All Vehicles		970	2.0	0.352	5.4	LOS A	2.2	56.0	0.30	0.18	22.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	70.3
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	13	354	113	100	322	6	5	16	12	109	20	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	6	4	0	0	0	0	0	3	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	478	159	139	435	8	7	22	16	150	27	169
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	120	40	35	109	2	2	6	4	38	7	42
Total Analysis Volume [veh/h]	18	478	159	139	435	8	7	22	16	150	27	169
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	21.10	16.00	0.35	1.53	1.86
95th-Percentile Queue Length [ft]	527.39	399.98	8.79	38.24	46.44
Approach Delay [s/veh]	102.01	71.97	12.45	14.92	
Approach LOS	F	F	B	B	
Intersection Delay [s/veh]	70.29				
Intersection LOS	F				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	10.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.006

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	3	37	41	3	56	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	50	55	4	76	49
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	13	14	1	19	12
Total Analysis Volume [veh/h]	4	50	55	4	76	49
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.05	0.00	0.00	0.05	0.00
d_M, Delay for Movement [s/veh]	10.40	8.78	0.00	0.00	7.45	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.18	0.18	0.00	0.00	0.26	0.26
95th-Percentile Queue Length [ft]	4.38	4.38	0.00	0.00	6.59	6.59
d_A, Approach Delay [s/veh]	8.90		0.00		4.53	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.40					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	25.6
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.347

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	18	340	315	69	68	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	3	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	24	465	428	93	92	15
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	116	107	23	23	4
Total Analysis Volume [veh/h]	24	465	428	93	92	15
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.35	0.03
d_M, Delay for Movement [s/veh]	8.52	0.00	0.00	0.00	25.58	11.26
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh]	2.54	2.54	0.00	0.00	1.49	0.08
95th-Percentile Queue Length [ft]	63.60	63.60	0.00	0.00	37.21	1.95
d_A, Approach Delay [s/veh]	0.42		0.00		23.57	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	2.44					
Intersection LOS	D					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	76.5
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name				K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name				K St			11th St			11th St		
Base Volume Input [veh/h]	96	283	37	54	233	7	21	104	84	52	121	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	0	3	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	130	388	50	73	318	9	28	140	113	70	163	62
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	97	13	18	80	2	7	35	28	18	41	16
Total Analysis Volume [veh/h]	130	388	50	73	318	9	28	140	113	70	163	62
Pedestrian Volume [ped/h]	17			18			5			12		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	22.84	9.36	4.47	5.03
95th-Percentile Queue Length [ft]	570.94	233.91	111.82	125.63
Approach Delay [s/veh]	148.24	46.52	25.33	27.62
Approach LOS	F	E	D	D
Intersection Delay [s/veh]	76.48			
Intersection LOS	F			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	11.6
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	66	66	39	32	1	1	34	9	63	39	78
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	17	17	10	8	0	0	9	2	16	10	20
Total Analysis Volume [veh/h]	5	66	66	39	32	1	1	34	9	63	39	78
Pedestrian Volume [ped/h]	4			3			3			7		

Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.06	0.01	0.10	0.06	0.08
d_M, Delay for Movement [s/veh]	7.30	0.00	0.00	7.58	0.00	0.00	11.63	11.12	8.79	11.19	11.20	9.44
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.29	0.29	0.29	0.16	0.16	0.16	0.18	0.18	0.18	0.56	0.56	0.56
95th-Percentile Queue Length [ft]	7.16	7.16	7.16	3.96	3.96	3.96	4.52	4.52	4.52	14.07	14.07	14.07
d_A, Approach Delay [s/veh]	0.27			4.11			10.65			10.44		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	6.19											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.3
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.017

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	11	26	9	3	28	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	35	12	4	38	14
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	9	3	1	10	4
Total Analysis Volume [veh/h]	15	35	12	4	38	14
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.03	0.00	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	9.32	8.57	0.00	0.00	7.30	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.16	0.16	0.00	0.00	0.10	0.10
95th-Percentile Queue Length [ft]	3.94	3.94	0.00	0.00	2.52	2.52
d_A, Approach Delay [s/veh]	8.79		0.00		5.34	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.08					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 13: Foster Avenue/ Creekside Prj Driveway

Control Type:	Two-way stop	Delay (sec / veh):	9.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	0	0	0	40	38	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	54	51	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	14	13	0
Total Analysis Volume [veh/h]	0	0	0	54	51	0
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.03	8.54	7.31	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	8.79		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.016

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.00	1.35	1.35	1.00	1.35	1.00	1.35	1.35	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	0	7	248	0	8	0	11	134	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	0	2	62	0	2	0	3	34	0	0	0
Total Analysis Volume [veh/h]	7	0	7	248	0	8	0	11	134	0	0	0
Pedestrian Volume [ped/h]	0			0			9			9		

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Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.13	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.57	0.00	9.70	0.00	0.00	0.00	0.00	10.88	8.97	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.49	0.49	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.82	0.00	0.82	0.00	0.00	0.00	0.00	12.37	12.37	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.14			0.00			9.11			0.00		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	3.53											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	13.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.222

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	87	27	89	19	8	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	117	36	120	26	11	244
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	9	30	7	3	61
Total Analysis Volume [veh/h]	117	36	120	26	11	244
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.22	0.03	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	13.23	10.50	7.50	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.85	0.85	0.64	0.64
95th-Percentile Queue Length [ft]	0.00	0.00	21.16	21.16	15.94	15.94
d_A, Approach Delay [s/veh]	0.00		12.74		0.32	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	3.51					
Intersection LOS	B					

APPENDIX T.1

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Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	17.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	95	95	183	225	158	392
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	4	0	0	0	0	14
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	132	128	247	304	213	543
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	32	62	76	53	136
Total Analysis Volume [veh/h]	132	128	247	304	213	543
Pedestrian Volume [ped/h]	75		0		0	

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.71	2.94	3.64	2.25	2.54	2.54
95th-Percentile Queue Length [ft]	92.78	73.38	91.07	56.23	63.54	63.54
Approach Delay [s/veh]	22.28	18.36		14.99		
Approach LOS	C	C		B		
Intersection Delay [s/veh]	17.39					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	135.9
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.922

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	74	0	118	0	0	0	93	430	0	0	251	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.00	1.00	1.00	1.35	1.35	1.00	1.00	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	4	0	0	0	0	0	6	14	0	0	4	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	104	0	159	0	0	0	132	595	0	0	343	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	0	40	0	0	0	33	149	0	0	86	23
Total Analysis Volume [veh/h]	104	0	159	0	0	0	132	595	0	0	343	90
Pedestrian Volume [ped/h]	75			0			0			0		

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Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No			
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.92	0.00	0.32	0.00	0.00	0.00	0.12	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	135.87	36.23	13.47	0.00	0.00	0.00	8.62	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	E	B				A	A			A	A
95th-Percentile Queue Length [veh]	5.72	0.56	0.56	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	143.03	13.89	13.89	0.00	0.00	0.00	9.92	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	61.87			0.00			1.56			0.00		
Approach LOS	F			A			A			A		
d_I, Intersection Delay [s/veh]	12.24											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	21.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	35	7	11	311	391	190	128	201	46	90	123	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	0	0	0	0	2	15	20	9	0	8	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	49	9	15	420	528	259	188	291	71	122	174	151
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	2	4	105	132	65	47	73	18	31	44	38
Total Analysis Volume [veh/h]	49	9	15	420	528	259	188	291	71	122	174	151
Pedestrian Volume [ped/h]	60			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.39	9.02	2.84	2.84	2.32	2.16	4.36	0.50	1.22	1.89	1.37
95th-Percentile Queue Length [ft]	9.66	225.4	70.89	70.89	58.01	54.00	109.07	12.43	30.42	47.17	34.16
Approach Delay [s/veh]	9.38	24.43				19.78			15.16		
Approach LOS	A	C				C			C		
Intersection Delay [s/veh]	21.01										
Intersection LOS	C										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset AM Future + Sunset Terrace

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	35	2.0	0.296	6.2	LOS A	1.5	38.8	0.48	0.36	22.7
8	T1	1	2.0	0.296	6.2	LOS A	1.5	38.8	0.48	0.36	22.7
18	R2	282	2.0	0.296	6.2	LOS A	1.5	38.8	0.48	0.36	22.5
Approach		318	2.0	0.296	6.2	LOS A	1.5	38.8	0.48	0.36	22.5
East: Sunset Ave											
1	L2	259	2.0	0.355	5.9	LOS A	2.2	56.7	0.19	0.07	22.6
6	T1	216	2.0	0.355	5.9	LOS A	2.2	56.7	0.19	0.07	22.7
16	R2	7	2.0	0.355	5.9	LOS A	2.2	56.7	0.19	0.07	22.4
Approach		482	2.0	0.355	5.9	LOS A	2.2	56.7	0.19	0.07	22.6
North: Jay Street											
7	L2	32	2.0	0.048	4.7	LOS A	0.2	4.8	0.52	0.41	22.7
4	T1	7	2.0	0.048	4.7	LOS A	0.2	4.8	0.52	0.41	22.8
14	R2	1	2.0	0.048	4.7	LOS A	0.2	4.8	0.52	0.41	22.5
Approach		40	2.0	0.048	4.7	LOS A	0.2	4.8	0.52	0.41	22.7
West: Sunset Ave											
5	L2	1	2.0	0.235	5.7	LOS A	1.1	28.9	0.48	0.37	23.0
2	T1	230	2.0	0.235	5.7	LOS A	1.1	28.9	0.48	0.37	23.1
12	R2	14	2.0	0.235	5.7	LOS A	1.1	28.9	0.48	0.37	22.8
Approach		245	2.0	0.235	5.7	LOS A	1.1	28.9	0.48	0.37	23.0
All Vehicles		1085	2.0	0.355	5.9	LOS A	2.2	56.7	0.35	0.23	22.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	40.7
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	3	232	116	120	290	3	5	11	8	185	5	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	2	2	0	0	0	0	0	9	0	6
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	313	159	164	392	4	7	15	11	259	7	94
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	78	40	41	98	1	2	4	3	65	2	24
Total Analysis Volume [veh/h]	4	313	159	164	392	4	7	15	11	259	7	94
Pedestrian Volume [ped/h]	14			7			15			10		

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	8.84	14.31	0.25	3.73	0.73
95th-Percentile Queue Length [ft]	220.95	357.65	6.33	93.33	18.21
Approach Delay [s/veh]	34.12	61.72	12.26	19.19	
Approach LOS	D	F	B	C	
Intersection Delay [s/veh]	40.67				
Intersection LOS	E				

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Intersection Level Of Service Report

Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.015

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.00	1.35	1.35	1.00	1.35	1.00	1.35	1.35	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	0	28	186	0	14	0	11	211	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	0	7	47	0	4	0	3	53	0	0	0
Total Analysis Volume [veh/h]	30	0	28	186	0	14	0	11	211	0	0	0
Pedestrian Volume [ped/h]	0			0			11			11		

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Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.20	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.26	0.00	9.47	0.00	0.00	0.00	0.00	10.83	9.34	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.13	0.00	0.13	0.00	0.00	0.00	0.00	0.81	0.81	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	3.35	0.00	3.35	0.00	0.00	0.00	0.00	20.28	20.28	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.88			0.00			9.42			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	5.55											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	13.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.193

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	160	93	68	25	18	129
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	216	126	92	34	24	174
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	54	32	23	9	6	44
Total Analysis Volume [veh/h]	216	126	92	34	24	174
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.19	0.04	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	13.89	11.06	7.86	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.71	0.71	0.54	0.54
95th-Percentile Queue Length [ft]	0.00	0.00	17.78	17.78	13.62	13.62
d_A, Approach Delay [s/veh]	0.00		13.12		0.95	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	2.77					
Intersection LOS	B					

APPENDIX T.1

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Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	94.2
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	280	155	170	243	307	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	0	0	0	0	9
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	394	209	230	328	414	253
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	99	52	58	82	104	63
Total Analysis Volume [veh/h]	394	209	230	328	414	253
Pedestrian Volume [ped/h]	147		0		0	

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	29.72	2.98	5.14	10.36	0.92	0.92
95th-Percentile Queue Length [ft]	743.05	74.43	128.49	258.97	23.07	23.07
Approach Delay [s/veh]	223.65	22.85		37.00		
Approach LOS	F	C		E		
Intersection Delay [s/veh]	94.25					
Intersection LOS	F					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	402.7
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.629

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	103	4	254	0	0	0	114	236	0	0	282	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.00	1.00	1.00	1.35	1.35	1.00	1.00	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	0	0	0	0	0	3	9	0	0	16	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	155	5	343	0	0	0	157	328	0	0	397	325
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	39	1	86	0	0	0	39	82	0	0	99	81
Total Analysis Volume [veh/h]	155	5	343	0	0	0	157	328	0	0	397	325
Pedestrian Volume [ped/h]	146			0			0			0		

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Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	1.63	0.06	0.48	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	402.69	49.85	12.12	0.00	0.00	0.00	9.98	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	E	B				A	A			A	A
95th-Percentile Queue Length [veh]	12.23	1.23	1.09	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	305.76	30.75	27.31	0.00	0.00	0.00	16.17	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	132.85			0.00			3.23			0.00		
Approach LOS	F			A			A			A		
d_I, Intersection Delay [s/veh]	40.00											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	13.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	75	30	26	149	279	101	67	175	60	111	152	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	9	0	0	0	0	6	9	12	5	0	32	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	110	41	35	201	377	142	99	248	86	150	237	157
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	10	9	50	94	36	25	62	22	38	59	39
Total Analysis Volume [veh/h]	110	41	35	201	377	142	99	248	86	150	237	157
Pedestrian Volume [ped/h]	112			0			0			0		

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.12	1.98	1.62	1.62	0.96	0.76	2.61	0.54	1.33	2.44	1.15
95th-Percentile Queue Length [ft]	28.02	49.47	40.62	40.62	23.94	19.06	65.14	13.43	33.20	61.02	28.66
Approach Delay [s/veh]	10.35	13.37				14.03			14.00		
Approach LOS	B	B				B			B		
Intersection Delay [s/veh]	13.41										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset PM Future + Sunset Terrace

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	11	2.0	0.238	5.2	LOS A	1.2	30.5	0.37	0.24	23.0
8	T1	12	2.0	0.238	5.2	LOS A	1.2	30.5	0.37	0.24	23.0
18	R2	256	2.0	0.238	5.2	LOS A	1.2	30.5	0.37	0.24	22.7
Approach		279	2.0	0.238	5.2	LOS A	1.2	30.5	0.37	0.24	22.8
East: Sunset Ave											
1	L2	298	2.0	0.361	5.9	LOS A	2.3	58.5	0.15	0.04	22.6
6	T1	153	2.0	0.361	5.9	LOS A	2.3	58.5	0.15	0.04	22.6
16	R2	45	2.0	0.361	5.9	LOS A	2.3	58.5	0.15	0.04	22.4
Approach		496	2.0	0.361	5.9	LOS A	2.3	58.5	0.15	0.04	22.6
North: Jay Street											
7	L2	45	2.0	0.071	4.8	LOS A	0.3	7.3	0.51	0.40	22.8
4	T1	14	2.0	0.071	4.8	LOS A	0.3	7.3	0.51	0.40	22.8
14	R2	3	2.0	0.071	4.8	LOS A	0.3	7.3	0.51	0.40	22.5
Approach		62	2.0	0.071	4.8	LOS A	0.3	7.3	0.51	0.40	22.8
West: Sunset Ave											
5	L2	1	2.0	0.149	5.1	LOS A	0.7	16.7	0.48	0.38	23.2
2	T1	130	2.0	0.149	5.1	LOS A	0.7	16.7	0.48	0.38	23.2
12	R2	15	2.0	0.149	5.1	LOS A	0.7	16.7	0.48	0.38	22.9
Approach		146	2.0	0.149	5.1	LOS A	0.7	16.7	0.48	0.38	23.2
All Vehicles		983	2.0	0.361	5.5	LOS A	2.3	58.5	0.28	0.17	22.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	71.9
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	13	354	113	100	322	6	5	16	12	109	20	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	9	6	0	0	0	0	0	5	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	478	162	141	435	8	7	22	16	152	27	170
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	120	41	35	109	2	2	6	4	38	7	43
Total Analysis Volume [veh/h]	18	478	162	141	435	8	7	22	16	152	27	170
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	21.45	16.24	0.35	1.56	1.87
95th-Percentile Queue Length [ft]	536.21	405.89	8.81	38.99	46.81
Approach Delay [s/veh]	104.53	73.63	12.46	14.98	
Approach LOS	F	F	B	B	
Intersection Delay [s/veh]	71.87				
Intersection LOS	F				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.016

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.00	1.35	1.35	1.00	1.35	1.00	1.35	1.35	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	0	7	248	0	8	0	11	134	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	0	2	62	0	2	0	3	34	0	0	0
Total Analysis Volume [veh/h]	7	0	7	248	0	8	0	11	134	0	0	0
Pedestrian Volume [ped/h]	0			0			9			9		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.13	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.57	0.00	9.70	0.00	0.00	0.00	0.00	10.88	8.97	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.49	0.49	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.82	0.00	0.82	0.00	0.00	0.00	0.00	12.37	12.37	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.14			0.00			9.11			0.00		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	3.53											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	13.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.222

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	87	27	89	19	8	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	117	36	120	26	11	244
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	9	30	7	3	61
Total Analysis Volume [veh/h]	117	36	120	26	11	244
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.22	0.03	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	13.23	10.50	7.50	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.85	0.85	0.64	0.64
95th-Percentile Queue Length [ft]	0.00	0.00	21.16	21.16	15.94	15.94
d_A, Approach Delay [s/veh]	0.00		12.74		0.32	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	3.51					
Intersection LOS	B					

APPENDIX T.1

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Version 4.00-02

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	17.2
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	95	95	183	225	158	392
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	0	0	0	0	1
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	131	128	247	304	213	530
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	32	62	76	53	133
Total Analysis Volume [veh/h]	131	128	247	304	213	530
Pedestrian Volume [ped/h]	75		0		0	

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.65	2.91	3.61	2.24	2.43	2.43
95th-Percentile Queue Length [ft]	91.32	72.78	90.19	56.10	60.76	60.76
Approach Delay [s/veh]	21.99	18.20		14.79		
Approach LOS	C	C		B		
Intersection Delay [s/veh]	17.20					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	134.6
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.931

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	74	0	118	0	0	0	93	430	0	0	251	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.00	1.00	1.00	1.35	1.35	1.00	1.00	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	9	0	0	0	0	0	2	1	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	109	0	159	0	0	0	128	582	0	0	342	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	0	40	0	0	0	32	146	0	0	86	23
Total Analysis Volume [veh/h]	109	0	159	0	0	0	128	582	0	0	342	90
Pedestrian Volume [ped/h]	75			0			0			0		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Stop		Free		Free	
Flared Lane								
Storage Area [veh]	0		0		0		0	
Two-Stage Gap Acceptance	No							
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.93	0.00	0.31	0.00	0.00	0.00	0.11	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	134.61	35.16	13.30	0.00	0.00	0.00	8.60	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	E	B				A	A			A	A
95th-Percentile Queue Length [veh]	5.90	0.54	0.54	0.00	0.00	0.00	0.38	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	147.62	13.62	13.62	0.00	0.00	0.00	9.57	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	62.64			0.00			1.55			0.00		
Approach LOS	F			A			A			A		
d_I, Intersection Delay [s/veh]	12.69											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	20.5
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	35	7	11	311	391	190	128	201	46	90	123	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	14	0	0	0	0	6	2	3	3	0	12	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	61	9	15	420	528	263	175	274	65	122	178	151
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	15	2	4	105	132	66	44	69	16	31	45	38
Total Analysis Volume [veh/h]	61	9	15	420	528	263	175	274	65	122	178	151
Pedestrian Volume [ped/h]	60			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.46	8.92	2.81	2.81	2.36	1.93	3.86	0.45	1.20	1.93	1.35
95th-Percentile Queue Length [ft]	11.59	223.0	70.26	70.26	58.97	48.19	96.42	11.23	30.07	48.19	33.69
Approach Delay [s/veh]	9.59	24.10				18.65			15.07		
Approach LOS	A	C				C			C		
Intersection Delay [s/veh]	20.51										
Intersection LOS	C										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset AM Future + Open Door

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	35	2.0	0.263	5.9	LOS A	1.3	33.3	0.46	0.34	22.8
8	T1	1	2.0	0.263	5.9	LOS A	1.3	33.3	0.46	0.34	22.8
18	R2	246	2.0	0.263	5.9	LOS A	1.3	33.3	0.46	0.34	22.5
Approach		282	2.0	0.263	5.9	LOS A	1.3	33.3	0.46	0.34	22.6
East: Sunset Ave											
1	L2	279	2.0	0.370	6.1	LOS A	2.4	60.3	0.19	0.07	22.6
6	T1	216	2.0	0.370	6.1	LOS A	2.4	60.3	0.19	0.07	22.6
16	R2	7	2.0	0.370	6.1	LOS A	2.4	60.3	0.19	0.07	22.4
Approach		502	2.0	0.370	6.1	LOS A	2.4	60.3	0.19	0.07	22.6
North: Jay Street											
7	L2	32	2.0	0.049	4.8	LOS A	0.2	4.9	0.53	0.43	22.7
4	T1	7	2.0	0.049	4.8	LOS A	0.2	4.9	0.53	0.43	22.7
14	R2	1	2.0	0.049	4.8	LOS A	0.2	4.9	0.53	0.43	22.5
Approach		40	2.0	0.049	4.8	LOS A	0.2	4.9	0.53	0.43	22.7
West: Sunset Ave											
5	L2	1	2.0	0.240	5.8	LOS A	1.2	29.4	0.49	0.39	23.0
2	T1	230	2.0	0.240	5.8	LOS A	1.2	29.4	0.49	0.39	23.0
12	R2	14	2.0	0.240	5.8	LOS A	1.2	29.4	0.49	0.39	22.8
Approach		245	2.0	0.240	5.8	LOS A	1.2	29.4	0.49	0.39	23.0
All Vehicles		1069	2.0	0.370	5.9	LOS A	2.4	60.3	0.34	0.23	22.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	40.9
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	3	232	116	120	290	3	5	11	8	185	5	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	14	9	0	0	0	0	0	4	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	313	171	171	392	4	7	15	11	254	7	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	78	43	43	98	1	2	4	3	64	2	23
Total Analysis Volume [veh/h]	4	313	171	171	392	4	7	15	11	254	7	90
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	8.88	14.62	0.24	3.47	0.68
95th-Percentile Queue Length [ft]	221.95	365.50	6.12	86.65	16.98
Approach Delay [s/veh]	33.32	63.11	11.95	18.23	
Approach LOS	D	F	B	C	
Intersection Delay [s/veh]	40.89				
Intersection LOS	E				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	13.5
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	1	83	57	3	122	80
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	112	77	4	165	108
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	28	19	1	41	27
Total Analysis Volume [veh/h]	1	112	77	4	165	108
Pedestrian Volume [ped/h]	9		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.12	0.00	0.00	0.11	0.00
d_M, Delay for Movement [s/veh]	13.55	9.25	0.00	0.00	7.71	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.40	0.40	0.00	0.00	0.67	0.67
95th-Percentile Queue Length [ft]	10.06	10.06	0.00	0.00	16.72	16.72
d_A, Approach Delay [s/veh]	9.29		0.00		4.66	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.97					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	35.5
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.593

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	21	247	321	173	121	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	14	4	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	28	347	437	234	163	27
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	87	109	59	41	7
Total Analysis Volume [veh/h]	28	347	437	234	163	27
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.00	0.00	0.59	0.05
d_M, Delay for Movement [s/veh]	9.04	0.00	0.00	0.00	35.51	12.13
Movement LOS	A	A	A	A	E	B
95th-Percentile Queue Length [veh]	2.01	2.01	0.00	0.00	3.50	0.16
95th-Percentile Queue Length [ft]	50.18	50.18	0.00	0.00	87.38	4.00
d_A, Approach Delay [s/veh]	0.67		0.00		32.18	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	5.15					
Intersection LOS	E					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	23.7
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	K St			K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	K St			K St			11th St			11th St		
Base Volume Input [veh/h]	109	143	16	37	182	6	38	153	112	32	73	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	14	0	0	4	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	147	207	22	50	250	8	51	207	151	43	99	36
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	52	6	13	63	2	13	52	38	11	25	9
Total Analysis Volume [veh/h]	147	207	22	50	250	8	51	207	151	43	99	36
Pedestrian Volume [ped/h]	9			9			6			6		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	5.92	4.00	6.70	1.70
95th-Percentile Queue Length [ft]	148.09	99.88	167.58	42.49
Approach Delay [s/veh]	26.07	20.45	27.79	14.91
Approach LOS	D	C	D	B
Intersection Delay [s/veh]	23.70			
Intersection LOS	C			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	13.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	76	73	85	82	3	5	31	8	70	24	61
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	19	18	21	21	1	1	8	2	18	6	15
Total Analysis Volume [veh/h]	3	76	73	85	82	3	5	31	8	70	24	61
Pedestrian Volume [ped/h]	5			5			4			4		

Intersection Settings

Priority Scheme	Free			Free			Stop			Stop		
Flared Lane							Yes			Yes		
Storage Area [veh]	0			0			1			1		
Two-Stage Gap Acceptance							No			No		
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.06	0.00	0.00	0.01	0.06	0.01	0.14	0.05	0.07
d_M, Delay for Movement [s/veh]	7.40	0.00	0.00	7.69	0.00	0.00	13.33	12.85	9.25	13.23	13.04	9.91
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.34	0.34	0.34	0.41	0.41	0.41	0.24	0.24	0.24	0.69	0.69	0.69
95th-Percentile Queue Length [ft]	8.44	8.44	8.44	10.16	10.16	10.16	6.00	6.00	6.00	17.16	17.16	17.16
d_A, Approach Delay [s/veh]	0.15			3.85			12.25			11.89		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	5.87											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	4	53	5	3	75	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	72	7	4	101	7
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	18	2	1	25	2
Total Analysis Volume [veh/h]	5	72	7	4	101	7
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.07	0.00	0.00	0.06	0.00
d_M, Delay for Movement [s/veh]	10.27	8.63	0.00	0.00	7.39	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.24	0.24	0.00	0.00	0.22	0.22
95th-Percentile Queue Length [ft]	5.99	5.99	0.00	0.00	5.39	5.39
d_A, Approach Delay [s/veh]	8.74		0.00		6.91	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.24					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 13: Foster Ave/ Project Driveway

Control Type:	Two-way stop	Delay (sec / veh):	9.5
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	0	0	0	58	81	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	78	109	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	20	27	0
Total Analysis Volume [veh/h]	0	0	0	78	109	0
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.49	8.81	7.43	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.15		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

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Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.015

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.00	1.35	1.35	1.00	1.35	1.00	1.35	1.35	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	0	28	186	0	14	0	11	211	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	0	7	47	0	4	0	3	53	0	0	0
Total Analysis Volume [veh/h]	30	0	28	186	0	14	0	11	211	0	0	0
Pedestrian Volume [ped/h]	0			0			11			11		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.20	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.26	0.00	9.47	0.00	0.00	0.00	0.00	10.83	9.34	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.13	0.00	0.13	0.00	0.00	0.00	0.00	0.81	0.81	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	3.35	0.00	3.35	0.00	0.00	0.00	0.00	20.28	20.28	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.88			0.00			9.42			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	5.55											
Intersection LOS	B											

APPENDIX T.1

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Intersection Level Of Service Report

Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	13.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.193

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	160	93	68	25	18	129
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	216	126	92	34	24	174
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	54	32	23	9	6	44
Total Analysis Volume [veh/h]	216	126	92	34	24	174
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.19	0.04	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	13.89	11.06	7.86	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.71	0.71	0.54	0.54
95th-Percentile Queue Length [ft]	0.00	0.00	17.78	17.78	13.62	13.62
d_A, Approach Delay [s/veh]	0.00		13.12		0.95	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	2.77					
Intersection LOS	B					

APPENDIX T.1

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Version 4.00-02

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	88.7
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	280	155	170	243	307	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	0	0	0	0	4
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	380	209	230	328	414	248
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	95	52	58	82	104	62
Total Analysis Volume [veh/h]	380	209	230	328	414	248
Pedestrian Volume [ped/h]	147		0		0	

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Version 4.00-02

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	28.14	2.97	5.13	10.36	0.90	0.90
95th-Percentile Queue Length [ft]	703.58	74.31	128.23	258.92	22.48	22.48
Approach Delay [s/veh]	209.19	22.80		37.16		
Approach LOS	F	C		E		
Intersection Delay [s/veh]	88.74					
Intersection LOS	F					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	348.0
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.496

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	103	4	254	0	0	0	114	236	0	0	282	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.00	1.00	1.00	1.35	1.35	1.00	1.00	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	0	0	0	0	0	8	4	0	0	2	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	144	5	343	0	0	0	162	323	0	0	383	325
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	1	86	0	0	0	41	81	0	0	96	81
Total Analysis Volume [veh/h]	144	5	343	0	0	0	162	323	0	0	383	325
Pedestrian Volume [ped/h]	146			0			0			0		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	1.50	0.06	0.48	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	348.04	49.45	12.06	0.00	0.00	0.00	9.94	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	E	B				A	A			A	A
95th-Percentile Queue Length [veh]	10.92	1.22	1.08	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	272.89	30.47	27.07	0.00	0.00	0.00	16.55	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	110.78			0.00			3.32			0.00		
Approach LOS	F			A			A			A		
d_I, Intersection Delay [s/veh]	33.30											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	13.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	75	30	26	149	279	101	67	175	60	111	152	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	0	0	0	0	3	12	12	18	0	7	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	109	41	35	201	377	139	102	248	99	150	212	157
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	27	10	9	50	94	35	26	62	25	38	53	39
Total Analysis Volume [veh/h]	109	41	35	201	377	139	102	248	99	150	212	157
Pedestrian Volume [ped/h]	112			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.08	1.96	1.61	1.61	0.92	0.79	2.58	0.63	1.32	2.02	1.14
95th-Percentile Queue Length [ft]	27.08	49.04	40.27	40.27	23.09	19.63	64.44	15.73	32.97	50.40	28.46
Approach Delay [s/veh]	10.14	13.28				13.86			13.40		
Approach LOS	B	B				B			B		
Intersection Delay [s/veh]	13.14										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset PM Future + Open Door

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	11	2.0	0.252	5.4	LOS A	1.3	32.7	0.38	0.24	22.9
8	T1	12	2.0	0.252	5.4	LOS A	1.3	32.7	0.38	0.24	23.0
18	R2	272	2.0	0.252	5.4	LOS A	1.3	32.7	0.38	0.24	22.7
Approach		295	2.0	0.252	5.4	LOS A	1.3	32.7	0.38	0.24	22.7
East: Sunset Ave											
1	L2	269	2.0	0.340	5.7	LOS A	2.1	53.5	0.14	0.04	22.6
6	T1	153	2.0	0.340	5.7	LOS A	2.1	53.5	0.14	0.04	22.7
16	R2	45	2.0	0.340	5.7	LOS A	2.1	53.5	0.14	0.04	22.4
Approach		467	2.0	0.340	5.7	LOS A	2.1	53.5	0.14	0.04	22.6
North: Jay Street											
7	L2	45	2.0	0.069	4.6	LOS A	0.3	7.1	0.49	0.38	22.8
4	T1	14	2.0	0.069	4.6	LOS A	0.3	7.1	0.49	0.38	22.8
14	R2	3	2.0	0.069	4.6	LOS A	0.3	7.1	0.49	0.38	22.6
Approach		62	2.0	0.069	4.6	LOS A	0.3	7.1	0.49	0.38	22.8
West: Sunset Ave											
5	L2	1	2.0	0.145	4.9	LOS A	0.6	16.3	0.46	0.35	23.2
2	T1	130	2.0	0.145	4.9	LOS A	0.6	16.3	0.46	0.35	23.2
12	R2	15	2.0	0.145	4.9	LOS A	0.6	16.3	0.46	0.35	23.0
Approach		146	2.0	0.145	4.9	LOS A	0.6	16.3	0.46	0.35	23.2
All Vehicles		970	2.0	0.340	5.4	LOS A	2.1	53.5	0.29	0.17	22.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	74.2
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	13	354	113	100	322	6	5	16	12	109	20	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	8	5	0	0	0	0	0	19	0	12
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	478	161	140	435	8	7	22	16	166	27	179
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	120	40	35	109	2	2	6	4	42	7	45
Total Analysis Volume [veh/h]	18	478	161	140	435	8	7	22	16	166	27	179
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	21.92	16.60	0.36	1.78	2.01
95th-Percentile Queue Length [ft]	548.02	414.95	8.90	44.46	50.18
Approach Delay [s/veh]	109.19	77.00	12.56	15.48	
Approach LOS	F	F	B	C	
Intersection Delay [s/veh]	74.20				
Intersection LOS	F				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	10.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.006

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	3	37	41	3	56	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	50	55	4	76	49
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	13	14	1	19	12
Total Analysis Volume [veh/h]	4	50	55	4	76	49
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.05	0.00	0.00	0.05	0.00
d_M, Delay for Movement [s/veh]	10.40	8.78	0.00	0.00	7.45	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.18	0.18	0.00	0.00	0.26	0.26
95th-Percentile Queue Length [ft]	4.38	4.38	0.00	0.00	6.59	6.59
d_A, Approach Delay [s/veh]	8.90		0.00		4.53	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.40					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	26.4
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.355

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	18	340	315	69	68	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	19	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	24	467	444	93	92	15
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	117	111	23	23	4
Total Analysis Volume [veh/h]	24	467	444	93	92	15
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.36	0.03
d_M, Delay for Movement [s/veh]	8.57	0.00	0.00	0.00	26.38	11.40
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh]	2.63	2.63	0.00	0.00	1.54	0.08
95th-Percentile Queue Length [ft]	65.63	65.63	0.00	0.00	38.50	2.00
d_A, Approach Delay [s/veh]	0.42		0.00		24.28	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	2.47					
Intersection LOS	D					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	81.7
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name				K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name				K St			11th St			11th St		
Base Volume Input [veh/h]	96	283	37	54	233	7	21	104	84	52	121	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	8	0	0	19	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	130	390	50	73	334	9	28	140	113	70	163	62
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	98	13	18	84	2	7	35	28	18	41	16
Total Analysis Volume [veh/h]	130	390	50	73	334	9	28	140	113	70	163	62
Pedestrian Volume [ped/h]	17			18			5			12		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	23.62	10.48	4.58	5.15
95th-Percentile Queue Length [ft]	590.51	262.05	114.56	128.71
Approach Delay [s/veh]	157.31	53.58	26.05	28.45
Approach LOS	F	F	D	D
Intersection Delay [s/veh]	81.73			
Intersection LOS	F			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	11.6
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	66	66	39	32	1	1	34	9	63	39	78
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	17	17	10	8	0	0	9	2	16	10	20
Total Analysis Volume [veh/h]	5	66	66	39	32	1	1	34	9	63	39	78
Pedestrian Volume [ped/h]	4			3			3			7		

Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.06	0.01	0.10	0.06	0.08
d_M, Delay for Movement [s/veh]	7.30	0.00	0.00	7.58	0.00	0.00	11.63	11.12	8.79	11.19	11.20	9.44
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.29	0.29	0.29	0.16	0.16	0.16	0.18	0.18	0.18	0.56	0.56	0.56
95th-Percentile Queue Length [ft]	7.16	7.16	7.16	3.96	3.96	3.96	4.52	4.52	4.52	14.07	14.07	14.07
d_A, Approach Delay [s/veh]	0.27			4.11			10.65			10.44		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	6.19											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.3
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.017

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	11	26	9	3	28	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	35	12	4	38	14
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	9	3	1	10	4
Total Analysis Volume [veh/h]	15	35	12	4	38	14
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.03	0.00	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	9.32	8.57	0.00	0.00	7.30	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.16	0.16	0.00	0.00	0.10	0.10
95th-Percentile Queue Length [ft]	3.94	3.94	0.00	0.00	2.52	2.52
d_A, Approach Delay [s/veh]	8.79		0.00		5.34	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.08					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 13: Foster Avenue/ Creekside Prj Driveway

Control Type:	Two-way stop	Delay (sec / veh):	9.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	0	0	0	40	38	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	54	51	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	14	13	0
Total Analysis Volume [veh/h]	0	0	0	54	51	0
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.03	8.54	7.31	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	8.79		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

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Intersection Level Of Service Report

Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.016

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.00	1.35	1.35	1.00	1.35	1.00	1.35	1.35	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	0	7	248	0	8	0	11	134	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	0	2	62	0	2	0	3	34	0	0	0
Total Analysis Volume [veh/h]	7	0	7	248	0	8	0	11	134	0	0	0
Pedestrian Volume [ped/h]	0			0			9			9		

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Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.13	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.57	0.00	9.70	0.00	0.00	0.00	0.00	10.88	8.97	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.49	0.49	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.82	0.00	0.82	0.00	0.00	0.00	0.00	12.37	12.37	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.14			0.00			9.11			0.00		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	3.53											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	13.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.222

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	87	27	89	19	8	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	117	36	120	26	11	244
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	9	30	7	3	61
Total Analysis Volume [veh/h]	117	36	120	26	11	244
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.22	0.03	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	13.23	10.50	7.50	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.85	0.85	0.64	0.64
95th-Percentile Queue Length [ft]	0.00	0.00	21.16	21.16	15.94	15.94
d_A, Approach Delay [s/veh]	0.00		12.74		0.32	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	3.51					
Intersection LOS	B					

APPENDIX T.1

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Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	17.2
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	95	95	183	225	158	392
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	0	0	0	0	4
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	129	128	247	304	213	533
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	32	62	76	53	133
Total Analysis Volume [veh/h]	129	128	247	304	213	533
Pedestrian Volume [ped/h]	75		0		0	

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.60	2.91	3.60	2.24	2.45	2.45
95th-Percentile Queue Length [ft]	90.02	72.74	90.12	56.03	61.25	61.25
Approach Delay [s/veh]	21.82	18.19		14.81		
Approach LOS	C	C		B		
Intersection Delay [s/veh]	17.17					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	118.6
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.863

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	74	0	118	0	0	0	93	430	0	0	251	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.00	1.00	1.00	1.35	1.35	1.00	1.00	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	0	0	0	0	0	2	4	0	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	101	0	159	0	0	0	128	585	0	0	340	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	0	40	0	0	0	32	146	0	0	85	23
Total Analysis Volume [veh/h]	101	0	159	0	0	0	128	585	0	0	340	90
Pedestrian Volume [ped/h]	75			0			0			0		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop	Stop	Free	Free
Flared Lane				
Storage Area [veh]	0	0	0	0
Two-Stage Gap Acceptance	No			
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.86	0.00	0.31	0.00	0.00	0.00	0.11	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	118.64	35.20	13.34	0.00	0.00	0.00	8.59	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	E	B				A	A			A	A
95th-Percentile Queue Length [veh]	5.24	0.55	0.55	0.00	0.00	0.00	0.38	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	130.91	13.68	13.68	0.00	0.00	0.00	9.56	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	54.25			0.00			1.54			0.00		
Approach LOS	F			A			A			A		
d_I, Intersection Delay [s/veh]	10.84											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	20.3
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	35	7	11	311	391	190	128	201	46	90	123	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	0	0	0	0	1	4	6	2	0	2	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	48	9	15	420	528	258	177	277	64	122	168	151
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	2	4	105	132	65	44	69	16	31	42	38
Total Analysis Volume [veh/h]	48	9	15	420	528	258	177	277	64	122	168	151
Pedestrian Volume [ped/h]	60			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.38	8.82	2.79	2.79	2.26	1.94	3.89	0.44	1.20	1.75	1.34
95th-Percentile Queue Length [ft]	9.61	220.5	69.63	69.63	56.55	48.52	97.13	10.93	29.91	43.81	33.46
Approach Delay [s/veh]	9.44	23.77				18.61			14.78		
Approach LOS	A	C				C			B		
Intersection Delay [s/veh]	20.34										
Intersection LOS	C										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset AM Future + Twin Parks

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	35	2.0	0.267	5.9	LOS A	1.3	33.9	0.46	0.35	22.8
8	T1	1	2.0	0.267	5.9	LOS A	1.3	33.9	0.46	0.35	22.8
18	R2	250	2.0	0.267	5.9	LOS A	1.3	33.9	0.46	0.35	22.5
Approach		286	2.0	0.267	5.9	LOS A	1.3	33.9	0.46	0.35	22.6
East: Sunset Ave											
1	L2	251	2.0	0.349	5.8	LOS A	2.2	55.3	0.19	0.07	22.7
6	T1	216	2.0	0.349	5.8	LOS A	2.2	55.3	0.19	0.07	22.7
16	R2	7	2.0	0.349	5.8	LOS A	2.2	55.3	0.19	0.07	22.4
Approach		474	2.0	0.349	5.8	LOS A	2.2	55.3	0.19	0.07	22.7
North: Jay Street											
7	L2	32	2.0	0.047	4.7	LOS A	0.2	4.8	0.52	0.41	22.7
4	T1	7	2.0	0.047	4.7	LOS A	0.2	4.8	0.52	0.41	22.8
14	R2	1	2.0	0.047	4.7	LOS A	0.2	4.8	0.52	0.41	22.5
Approach		40	2.0	0.047	4.7	LOS A	0.2	4.8	0.52	0.41	22.7
West: Sunset Ave											
5	L2	1	2.0	0.233	5.6	LOS A	1.1	28.7	0.47	0.36	23.0
2	T1	230	2.0	0.233	5.6	LOS A	1.1	28.7	0.47	0.36	23.1
12	R2	14	2.0	0.233	5.6	LOS A	1.1	28.7	0.47	0.36	22.8
Approach		245	2.0	0.233	5.6	LOS A	1.1	28.7	0.47	0.36	23.1
All Vehicles		1045	2.0	0.349	5.8	LOS A	2.2	55.3	0.34	0.22	22.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	38.7
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	3	232	116	120	290	3	5	11	8	185	5	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	1	0	0	0	0	0	0	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	313	157	163	392	4	7	15	11	250	7	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	78	39	41	98	1	2	4	3	63	2	23
Total Analysis Volume [veh/h]	4	313	157	163	392	4	7	15	11	250	7	90
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	8.49	13.85	0.25	3.45	0.69
95th-Percentile Queue Length [ft]	212.23	346.22	6.25	86.30	17.22
Approach Delay [s/veh]	32.34	58.27	12.13	18.40	
Approach LOS	D	F	B	C	
Intersection Delay [s/veh]	38.70				
Intersection LOS	E				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	13.5
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	1	83	57	3	122	80
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	112	77	4	165	108
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	28	19	1	41	27
Total Analysis Volume [veh/h]	1	112	77	4	165	108
Pedestrian Volume [ped/h]	9		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.12	0.00	0.00	0.11	0.00
d_M, Delay for Movement [s/veh]	13.55	9.25	0.00	0.00	7.71	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.40	0.40	0.00	0.00	0.67	0.67
95th-Percentile Queue Length [ft]	10.06	10.06	0.00	0.00	16.72	16.72
d_A, Approach Delay [s/veh]	9.29		0.00		4.66	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.97					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	18.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.306

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	21	247	321	173	121	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	4	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	21	248	325	173	121	20
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	62	81	43	30	5
Total Analysis Volume [veh/h]	21	248	325	173	121	20
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.31	0.03
d_M, Delay for Movement [s/veh]	8.45	0.00	0.00	0.00	18.07	10.80
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	1.00	1.00	0.00	0.00	1.28	0.10
95th-Percentile Queue Length [ft]	25.06	25.06	0.00	0.00	31.89	2.42
d_A, Approach Delay [s/veh]	0.66		0.00		17.04	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	2.84					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	22.7
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	K St			K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	K St			K St			11th St			11th St		
Base Volume Input [veh/h]	109	143	16	37	182	6	38	153	112	32	73	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	4	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	147	194	22	50	250	8	51	207	151	43	99	36
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	49	6	13	63	2	13	52	38	11	25	9
Total Analysis Volume [veh/h]	147	194	22	50	250	8	51	207	151	43	99	36
Pedestrian Volume [ped/h]	9			9			6			6		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	5.40	3.92	6.54	1.67
95th-Percentile Queue Length [ft]	134.94	97.94	163.50	41.74
Approach Delay [s/veh]	24.21	20.04	26.93	14.68
Approach LOS	C	C	D	B
Intersection Delay [s/veh]	22.73			
Intersection LOS	C			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	13.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	76	73	85	82	3	5	31	8	70	24	61
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	19	18	21	21	1	1	8	2	18	6	15
Total Analysis Volume [veh/h]	3	76	73	85	82	3	5	31	8	70	24	61
Pedestrian Volume [ped/h]	5			5			4			4		

Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.06	0.00	0.00	0.01	0.06	0.01	0.14	0.05	0.07
d_M, Delay for Movement [s/veh]	7.40	0.00	0.00	7.69	0.00	0.00	13.33	12.85	9.25	13.23	13.04	9.91
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.34	0.34	0.34	0.41	0.41	0.41	0.24	0.24	0.24	0.69	0.69	0.69
95th-Percentile Queue Length [ft]	8.44	8.44	8.44	10.16	10.16	10.16	6.00	6.00	6.00	17.16	17.16	17.16
d_A, Approach Delay [s/veh]	0.15			3.85			12.25			11.89		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	5.87											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	4	53	5	3	75	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	72	7	4	101	7
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	18	2	1	25	2
Total Analysis Volume [veh/h]	5	72	7	4	101	7
Pedestrian Volume [ped/h]	0		0		0	

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.07	0.00	0.00	0.06	0.00
d_M, Delay for Movement [s/veh]	10.27	8.63	0.00	0.00	7.39	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.24	0.24	0.00	0.00	0.22	0.22
95th-Percentile Queue Length [ft]	5.99	5.99	0.00	0.00	5.39	5.39
d_A, Approach Delay [s/veh]	8.74		0.00		6.91	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.24					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 13: Foster Ave/ Project Driveway

Control Type:	Two-way stop	Delay (sec / veh):	9.5
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	0	0	0	58	81	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	78	109	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	20	27	0
Total Analysis Volume [veh/h]	0	0	0	78	109	0
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.49	8.81	7.43	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.15		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.015

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.00	1.35	1.35	1.00	1.35	1.00	1.35	1.35	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	0	28	186	0	14	0	11	211	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	0	7	47	0	4	0	3	53	0	0	0
Total Analysis Volume [veh/h]	30	0	28	186	0	14	0	11	211	0	0	0
Pedestrian Volume [ped/h]	0			0			11			11		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.20	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.26	0.00	9.47	0.00	0.00	0.00	0.00	10.83	9.34	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.13	0.00	0.13	0.00	0.00	0.00	0.00	0.81	0.81	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	3.35	0.00	3.35	0.00	0.00	0.00	0.00	20.28	20.28	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.88			0.00			9.42			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	5.55											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	13.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.193

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	160	93	68	25	18	129
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	216	126	92	34	24	174
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	54	32	23	9	6	44
Total Analysis Volume [veh/h]	216	126	92	34	24	174
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.19	0.04	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	13.89	11.06	7.86	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.71	0.71	0.54	0.54
95th-Percentile Queue Length [ft]	0.00	0.00	17.78	17.78	13.62	13.62
d_A, Approach Delay [s/veh]	0.00		13.12		0.95	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	2.77					
Intersection LOS	B					

APPENDIX T.1

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Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	89.9
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	280	155	170	243	307	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	383	209	230	328	414	247
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	96	52	58	82	104	62
Total Analysis Volume [veh/h]	383	209	230	328	414	247
Pedestrian Volume [ped/h]	147		0		0	

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	28.46	2.97	5.13	10.36	0.89	0.89
95th-Percentile Queue Length [ft]	711.52	74.29	128.18	258.91	22.37	22.37
Approach Delay [s/veh]	212.00	22.79		37.20		
Approach LOS	F	C		E		
Intersection Delay [s/veh]	89.90					
Intersection LOS	F					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	330.4
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.458

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	103	4	254	0	0	0	114	236	0	0	282	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.00	1.00	1.00	1.35	1.35	1.00	1.00	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	0	0	0	0	0	1	3	0	0	5	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	144	5	343	0	0	0	155	322	0	0	386	325
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	1	86	0	0	0	39	81	0	0	97	81
Total Analysis Volume [veh/h]	144	5	343	0	0	0	155	322	0	0	386	325
Pedestrian Volume [ped/h]	146			0			0			0		

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Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	1.46	0.06	0.48	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	330.36	48.35	12.03	0.00	0.00	0.00	9.91	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	E	B				A	A			A	A
95th-Percentile Queue Length [veh]	10.70	1.21	1.08	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	267.53	30.22	26.92	0.00	0.00	0.00	15.74	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	105.57			0.00			3.22			0.00		
Approach LOS	F			A			A			A		
d_I, Intersection Delay [s/veh]	31.83											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	13.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	75	30	26	149	279	101	67	175	60	111	152	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	0	0	0	0	3	3	4	1	0	10	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	104	41	35	201	377	139	93	240	82	150	215	157
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	10	9	50	94	35	23	60	21	38	54	39
Total Analysis Volume [veh/h]	104	41	35	201	377	139	93	240	82	150	215	157
Pedestrian Volume [ped/h]	112			0			0			0		

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.09	1.95	1.60	1.60	0.92	0.70	2.44	0.50	1.32	2.07	1.14
95th-Percentile Queue Length [ft]	27.32	48.75	40.01	40.01	22.94	17.54	60.96	12.61	33.09	51.72	28.52
Approach Delay [s/veh]	10.40	13.20				13.69			13.49		
Approach LOS	B	B				B			B		
Intersection Delay [s/veh]	13.12										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset PM Future + Twin Parks

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	11	2.0	0.223	5.1	LOS A	1.1	28.1	0.37	0.23	23.0
8	T1	12	2.0	0.223	5.1	LOS A	1.1	28.1	0.37	0.23	23.1
18	R2	238	2.0	0.223	5.1	LOS A	1.1	28.1	0.37	0.23	22.8
Approach		261	2.0	0.223	5.1	LOS A	1.1	28.1	0.37	0.23	22.8
East: Sunset Ave											
1	L2	267	2.0	0.338	5.6	LOS A	2.1	53.1	0.14	0.04	22.7
6	T1	153	2.0	0.338	5.6	LOS A	2.1	53.1	0.14	0.04	22.7
16	R2	45	2.0	0.338	5.6	LOS A	2.1	53.1	0.14	0.04	22.4
Approach		465	2.0	0.338	5.6	LOS A	2.1	53.1	0.14	0.04	22.6
North: Jay Street											
7	L2	45	2.0	0.068	4.6	LOS A	0.3	7.1	0.49	0.38	22.8
4	T1	14	2.0	0.068	4.6	LOS A	0.3	7.1	0.49	0.38	22.8
14	R2	3	2.0	0.068	4.6	LOS A	0.3	7.1	0.49	0.38	22.6
Approach		62	2.0	0.068	4.6	LOS A	0.3	7.1	0.49	0.38	22.8
West: Sunset Ave											
5	L2	1	2.0	0.145	4.9	LOS A	0.6	16.3	0.46	0.35	23.2
2	T1	130	2.0	0.145	4.9	LOS A	0.6	16.3	0.46	0.35	23.2
12	R2	15	2.0	0.145	4.9	LOS A	0.6	16.3	0.46	0.35	23.0
Approach		146	2.0	0.145	4.9	LOS A	0.6	16.3	0.46	0.35	23.2
All Vehicles		934	2.0	0.338	5.3	LOS A	2.1	53.1	0.28	0.17	22.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	68.7
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	13	354	113	100	322	6	5	16	12	109	20	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	5	0	0	0	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	478	153	140	435	8	7	22	16	147	27	170
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	120	38	35	109	2	2	6	4	37	7	43
Total Analysis Volume [veh/h]	18	478	153	140	435	8	7	22	16	147	27	170
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	20.52	16.04	0.35	1.49	1.87
95th-Percentile Queue Length [ft]	513.08	400.91	8.78	37.14	46.80
Approach Delay [s/veh]	98.19	72.11	12.44	14.88	
Approach LOS	F	F	B	B	
Intersection Delay [s/veh]	68.75				
Intersection LOS	F				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	10.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.006

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	3	37	41	3	56	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	50	55	4	76	49
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	13	14	1	19	12
Total Analysis Volume [veh/h]	4	50	55	4	76	49
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.05	0.00	0.00	0.05	0.00
d_M, Delay for Movement [s/veh]	10.40	8.78	0.00	0.00	7.45	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.18	0.18	0.00	0.00	0.26	0.26
95th-Percentile Queue Length [ft]	4.38	4.38	0.00	0.00	6.59	6.59
d_A, Approach Delay [s/veh]	8.90		0.00		4.53	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.40					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	25.5
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.346

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	18	340	315	69	68	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	5	3	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	24	464	428	93	92	15
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	116	107	23	23	4
Total Analysis Volume [veh/h]	24	464	428	93	92	15
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.35	0.03
d_M, Delay for Movement [s/veh]	8.52	0.00	0.00	0.00	25.54	11.26
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh]	2.53	2.53	0.00	0.00	1.49	0.08
95th-Percentile Queue Length [ft]	63.37	63.37	0.00	0.00	37.14	1.95
d_A, Approach Delay [s/veh]	0.42		0.00		23.54	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	2.44					
Intersection LOS	D					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	76.1
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name				K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name				K St			11th St			11th St		
Base Volume Input [veh/h]	96	283	37	54	233	7	21	104	84	52	121	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	5	0	0	3	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	130	387	50	73	318	9	28	140	113	70	163	62
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	97	13	18	80	2	7	35	28	18	41	16
Total Analysis Volume [veh/h]	130	387	50	73	318	9	28	140	113	70	163	62
Pedestrian Volume [ped/h]	17			18			5			12		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	22.74	9.36	4.47	5.02
95th-Percentile Queue Length [ft]	568.41	233.90	111.82	125.62
Approach Delay [s/veh]	147.39	46.52	25.33	27.62
Approach LOS	F	E	D	D
Intersection Delay [s/veh]	76.12			
Intersection LOS	F			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	11.6
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	66	66	39	32	1	1	34	9	63	39	78
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	17	17	10	8	0	0	9	2	16	10	20
Total Analysis Volume [veh/h]	5	66	66	39	32	1	1	34	9	63	39	78
Pedestrian Volume [ped/h]	4			3			3			7		

Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.06	0.01	0.10	0.06	0.08
d_M, Delay for Movement [s/veh]	7.30	0.00	0.00	7.58	0.00	0.00	11.63	11.12	8.79	11.19	11.20	9.44
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.29	0.29	0.29	0.16	0.16	0.16	0.18	0.18	0.18	0.56	0.56	0.56
95th-Percentile Queue Length [ft]	7.16	7.16	7.16	3.96	3.96	3.96	4.52	4.52	4.52	14.07	14.07	14.07
d_A, Approach Delay [s/veh]	0.27			4.11			10.65			10.44		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	6.19											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.3
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.017

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	11	26	9	3	28	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	35	12	4	38	14
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	9	3	1	10	4
Total Analysis Volume [veh/h]	15	35	12	4	38	14
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.03	0.00	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	9.32	8.57	0.00	0.00	7.30	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.16	0.16	0.00	0.00	0.10	0.10
95th-Percentile Queue Length [ft]	3.94	3.94	0.00	0.00	2.52	2.52
d_A, Approach Delay [s/veh]	8.79		0.00		5.34	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.08					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 13: Foster Avenue/ Creekside Prj Driveway

Control Type:	Two-way stop	Delay (sec / veh):	9.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	0	0	0	40	38	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	54	51	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	14	13	0
Total Analysis Volume [veh/h]	0	0	0	54	51	0
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.03	8.54	7.31	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	8.79		0.00		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.00					
Intersection LOS	A					

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Intersection Level Of Service Report

Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.016

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.00	1.35	1.35	1.00	1.35	1.00	1.35	1.35	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	0	7	248	0	8	0	11	134	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	0	2	62	0	2	0	3	34	0	0	0
Total Analysis Volume [veh/h]	7	0	7	248	0	8	0	11	134	0	0	0
Pedestrian Volume [ped/h]	0			0			9			9		

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Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.13	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.57	0.00	9.70	0.00	0.00	0.00	0.00	10.88	8.97	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.49	0.49	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.82	0.00	0.82	0.00	0.00	0.00	0.00	12.37	12.37	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.14			0.00			9.11			0.00		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	3.53											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	13.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.222

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	87	27	89	19	8	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	117	36	120	26	11	244
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	9	30	7	3	61
Total Analysis Volume [veh/h]	117	36	120	26	11	244
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.22	0.03	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	13.23	10.50	7.50	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.85	0.85	0.64	0.64
95th-Percentile Queue Length [ft]	0.00	0.00	21.16	21.16	15.94	15.94
d_A, Approach Delay [s/veh]	0.00		12.74		0.32	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	3.51					
Intersection LOS	B					

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Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	17.2
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	95	95	183	225	158	392
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	129	128	247	304	213	532
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	32	62	76	53	133
Total Analysis Volume [veh/h]	129	128	247	304	213	532
Pedestrian Volume [ped/h]	75		0		0	

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.60	2.91	3.60	2.24	2.44	2.44
95th-Percentile Queue Length [ft]	89.97	72.70	90.06	56.02	61.05	61.05
Approach Delay [s/veh]	21.81	18.17		14.80		
Approach LOS	C	C		B		
Intersection Delay [s/veh]	17.15					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	120.6
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.867

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	74	0	118	0	0	0	93	430	0	0	251	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.00	1.00	1.00	1.35	1.35	1.00	1.00	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	6	3	0	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	100	0	159	0	0	0	132	584	0	0	340	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	0	40	0	0	0	33	146	0	0	85	23
Total Analysis Volume [veh/h]	100	0	159	0	0	0	132	584	0	0	340	90
Pedestrian Volume [ped/h]	75			0			0			0		

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Intersection Settings

Priority Scheme	Stop		Stop		Free		Free	
Flared Lane								
Storage Area [veh]	0		0		0		0	
Two-Stage Gap Acceptance	No							
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.87	0.00	0.31	0.00	0.00	0.00	0.12	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	120.64	35.60	13.33	0.00	0.00	0.00	8.61	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	E	B				A	A			A	A
95th-Percentile Queue Length [veh]	5.24	0.55	0.55	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	131.00	13.66	13.66	0.00	0.00	0.00	9.89	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	54.76			0.00			1.59			0.00		
Approach LOS	F			A			A			A		
d_I, Intersection Delay [s/veh]	10.90											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	20.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	35	7	11	311	391	190	128	201	46	90	123	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	3	0	9	0	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	47	9	15	420	528	260	173	280	62	122	167	151
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	2	4	105	132	65	43	70	16	31	42	38
Total Analysis Volume [veh/h]	47	9	15	420	528	260	173	280	62	122	167	151
Pedestrian Volume [ped/h]	60			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.38	8.81	2.78	2.78	2.29	1.87	3.97	0.42	1.20	1.74	1.34
95th-Percentile Queue Length [ft]	9.54	220.3	69.58	69.58	57.23	46.83	99.24	10.54	29.91	43.43	33.47
Approach Delay [s/veh]	9.48	23.74				18.75			14.76		
Approach LOS	A	C				C			B		
Intersection Delay [s/veh]	20.37										
Intersection LOS	C										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset AM Future + Creekside

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	35	2.0	0.264	5.9	LOS A	1.3	33.5	0.46	0.34	22.8
8	T1	1	2.0	0.264	5.9	LOS A	1.3	33.5	0.46	0.34	22.8
18	R2	247	2.0	0.264	5.9	LOS A	1.3	33.5	0.46	0.34	22.5
Approach		283	2.0	0.264	5.9	LOS A	1.3	33.5	0.46	0.34	22.6
East: Sunset Ave											
1	L2	251	2.0	0.349	5.8	LOS A	2.2	55.3	0.19	0.07	22.7
6	T1	216	2.0	0.349	5.8	LOS A	2.2	55.3	0.19	0.07	22.7
16	R2	7	2.0	0.349	5.8	LOS A	2.2	55.3	0.19	0.07	22.4
Approach		474	2.0	0.349	5.8	LOS A	2.2	55.3	0.19	0.07	22.7
North: Jay Street											
7	L2	32	2.0	0.047	4.7	LOS A	0.2	4.8	0.52	0.41	22.7
4	T1	7	2.0	0.047	4.7	LOS A	0.2	4.8	0.52	0.41	22.8
14	R2	1	2.0	0.047	4.7	LOS A	0.2	4.8	0.52	0.41	22.5
Approach		40	2.0	0.047	4.7	LOS A	0.2	4.8	0.52	0.41	22.7
West: Sunset Ave											
5	L2	1	2.0	0.233	5.6	LOS A	1.1	28.7	0.47	0.36	23.0
2	T1	230	2.0	0.233	5.6	LOS A	1.1	28.7	0.47	0.36	23.1
12	R2	14	2.0	0.233	5.6	LOS A	1.1	28.7	0.47	0.36	22.8
Approach		245	2.0	0.233	5.6	LOS A	1.1	28.7	0.47	0.36	23.1
All Vehicles		1042	2.0	0.349	5.7	LOS A	2.2	55.3	0.34	0.22	22.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	42.8
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	3	232	116	120	290	3	5	11	8	185	5	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	11	9	0	5	0	0	0	0	4	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	324	166	162	397	4	7	15	11	254	7	88
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	81	42	41	99	1	2	4	3	64	2	22
Total Analysis Volume [veh/h]	4	324	166	162	397	4	7	15	11	254	7	88
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	9.75	14.61	0.26	3.64	0.68
95th-Percentile Queue Length [ft]	243.72	365.36	6.39	90.99	17.07
Approach Delay [s/veh]	37.81	63.72	12.34	19.14	
Approach LOS	E	F	B	C	
Intersection Delay [s/veh]	42.83				
Intersection LOS	E				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	14.6
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	1	83	57	3	122	80
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	52	0	0	25
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	112	129	4	165	133
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	28	32	1	41	33
Total Analysis Volume [veh/h]	1	112	129	4	165	133
Pedestrian Volume [ped/h]	9		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.12	0.00	0.00	0.12	0.00
d_M, Delay for Movement [s/veh]	14.57	9.59	0.00	0.00	7.85	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.43	0.43	0.00	0.00	0.79	0.79
95th-Percentile Queue Length [ft]	10.85	10.85	0.00	0.00	19.66	19.66
d_A, Approach Delay [s/veh]	9.63		0.00		4.35	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.38					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	45.3
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.698

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	21	247	321	173	121	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	0	0	9	20	32
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	44	333	433	243	183	59
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	83	108	61	46	15
Total Analysis Volume [veh/h]	44	333	433	243	183	59
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.00	0.00	0.00	0.70	0.11
d_M, Delay for Movement [s/veh]	9.13	0.00	0.00	0.00	45.33	12.62
Movement LOS	A	A	A	A	E	B
95th-Percentile Queue Length [veh]	2.04	2.04	0.00	0.00	4.70	0.37
95th-Percentile Queue Length [ft]	50.96	50.96	0.00	0.00	117.61	9.30
d_A, Approach Delay [s/veh]	1.07		0.00		37.35	
Approach LOS	A		A		E	
d_I, Intersection Delay [s/veh]	7.29					
Intersection LOS	E					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	25.8
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes		

Intersection Setup

Name	K St			K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	K St			K St			11th St			11th St		
Base Volume Input [veh/h]	109	143	16	37	182	6	38	153	112	32	73	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	13	0	6	26	0	0	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	147	206	22	56	272	8	51	207	151	43	99	39
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	52	6	14	68	2	13	52	38	11	25	10
Total Analysis Volume [veh/h]	147	206	22	56	272	8	51	207	151	43	99	39
Pedestrian Volume [ped/h]	9			9			6			6		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	6.23	4.96	7.12	1.82
95th-Percentile Queue Length [ft]	155.71	123.94	178.12	45.41
Approach Delay [s/veh]	27.83	23.75	30.10	15.57
Approach LOS	D	C	D	C
Intersection Delay [s/veh]	25.79			
Intersection LOS	D			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	13.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	3	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	77	73	85	85	3	5	31	8	70	24	61
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	19	18	21	21	1	1	8	2	18	6	15
Total Analysis Volume [veh/h]	3	77	73	85	85	3	5	31	8	70	24	61
Pedestrian Volume [ped/h]	5			5			4			4		

Intersection Settings

Priority Scheme	Free			Free			Stop			Stop		
Flared Lane							Yes			Yes		
Storage Area [veh]	0			0			1			1		
Two-Stage Gap Acceptance							No			No		
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.06	0.00	0.00	0.01	0.06	0.01	0.14	0.05	0.07
d_M, Delay for Movement [s/veh]	7.41	0.00	0.00	7.69	0.00	0.00	13.39	12.90	9.27	13.29	13.09	9.93
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.34	0.34	0.34	0.41	0.41	0.41	0.24	0.24	0.24	0.69	0.69	0.69
95th-Percentile Queue Length [ft]	8.52	8.52	8.52	10.37	10.37	10.37	6.03	6.03	6.03	17.29	17.29	17.29
d_A, Approach Delay [s/veh]	0.15			3.78			12.29			11.93		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	5.84											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	4	53	5	3	75	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	73	7	4	104	7
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	18	2	1	26	2
Total Analysis Volume [veh/h]	5	73	7	4	104	7
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.07	0.00	0.00	0.06	0.00
d_M, Delay for Movement [s/veh]	10.32	8.64	0.00	0.00	7.39	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.24	0.24	0.00	0.00	0.22	0.22
95th-Percentile Queue Length [ft]	6.07	6.07	0.00	0.00	5.55	5.55
d_A, Approach Delay [s/veh]	8.74		0.00		6.93	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.25					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 13: Foster Ave/ Project Driveway

Control Type:	Two-way stop	Delay (sec / veh):	9.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.066

Intersection Setup

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	0	0	0	58	81	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	52	3	1	0	0	25
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	3	1	78	109	25
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	1	0	20	27	6
Total Analysis Volume [veh/h]	52	3	1	78	109	25
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.92	9.21	7.48	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.22	0.22	0.17	0.17	0.00	0.00
95th-Percentile Queue Length [ft]	5.57	5.57	4.32	4.32	0.00	0.00
d_A, Approach Delay [s/veh]	9.88		0.09		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.05					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.015

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.00	1.35	1.35	1.00	1.35	1.00	1.35	1.35	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	0	28	186	0	14	0	11	211	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	0	7	47	0	4	0	3	53	0	0	0
Total Analysis Volume [veh/h]	30	0	28	186	0	14	0	11	211	0	0	0
Pedestrian Volume [ped/h]	0			0			11			11		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Stop		Free	
Flared Lane	Yes				No			
Storage Area [veh]	1		0		0		0	
Two-Stage Gap Acceptance	No				No			
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.20	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.26	0.00	9.47	0.00	0.00	0.00	0.00	10.83	9.34	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.13	0.00	0.13	0.00	0.00	0.00	0.00	0.81	0.81	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	3.35	0.00	3.35	0.00	0.00	0.00	0.00	20.28	20.28	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.88			0.00			9.42			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	5.55											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	13.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.193

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	160	93	68	25	18	129
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	216	126	92	34	24	174
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	54	32	23	9	6	44
Total Analysis Volume [veh/h]	216	126	92	34	24	174
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.19	0.04	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	13.89	11.06	7.86	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.71	0.71	0.54	0.54
95th-Percentile Queue Length [ft]	0.00	0.00	17.78	17.78	13.62	13.62
d_A, Approach Delay [s/veh]	0.00		13.12		0.95	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	2.77					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	89.1
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	280	155	170	243	307	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	0	0	0	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	381	209	230	328	414	246
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	95	52	58	82	104	62
Total Analysis Volume [veh/h]	381	209	230	328	414	246
Pedestrian Volume [ped/h]	147		0		0	

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	28.23	2.97	5.13	10.36	0.89	0.89
95th-Percentile Queue Length [ft]	705.85	74.27	128.13	258.90	22.25	22.25
Approach Delay [s/veh]	209.91	22.78		37.23		
Approach LOS	F	C		E		
Intersection Delay [s/veh]	89.12					
Intersection LOS	F					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	315.5
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.418

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	103	4	254	0	0	0	114	236	0	0	282	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.00	1.00	1.00	1.35	1.35	1.00	1.00	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	4	2	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	139	5	343	0	0	0	158	321	0	0	384	325
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	1	86	0	0	0	40	80	0	0	96	81
Total Analysis Volume [veh/h]	139	5	343	0	0	0	158	321	0	0	384	325
Pedestrian Volume [ped/h]	146			0			0			0		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Stop		Free		Free	
Flared Lane								
Storage Area [veh]	0		0		0		0	
Two-Stage Gap Acceptance	No							
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	1.42	0.06	0.48	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	315.47	48.68	12.02	0.00	0.00	0.00	9.92	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	E	B				A	A			A	A
95th-Percentile Queue Length [veh]	10.22	1.21	1.08	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	255.54	30.24	26.91	0.00	0.00	0.00	16.08	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	99.01			0.00			3.27			0.00		
Approach LOS	F			A			A			A		
d_I, Intersection Delay [s/veh]	29.72											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	13.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	75	30	26	149	279	101	67	175	60	111	152	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	7	0	6	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	101	41	35	201	377	143	90	242	81	150	208	157
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	10	9	50	94	36	23	61	20	38	52	39
Total Analysis Volume [veh/h]	101	41	35	201	377	143	90	242	81	150	208	157
Pedestrian Volume [ped/h]	112			0			0			0		

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.07	1.94	1.59	1.59	0.95	0.67	2.47	0.50	1.32	1.96	1.14
95th-Percentile Queue Length [ft]	26.85	48.58	39.87	39.87	23.72	16.82	61.63	12.40	33.10	49.08	28.52
Approach Delay [s/veh]	10.40	13.17				13.72			13.36		
Approach LOS	B	B				B			B		
Intersection Delay [s/veh]	13.08										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset PM Future + Creekside

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	11	2.0	0.221	5.1	LOS A	1.1	27.8	0.37	0.23	23.0
8	T1	12	2.0	0.221	5.1	LOS A	1.1	27.8	0.37	0.23	23.1
18	R2	236	2.0	0.221	5.1	LOS A	1.1	27.8	0.37	0.23	22.8
Approach		259	2.0	0.221	5.1	LOS A	1.1	27.8	0.37	0.23	22.8
East: Sunset Ave											
1	L2	261	2.0	0.334	5.6	LOS A	2.1	52.1	0.14	0.04	22.7
6	T1	153	2.0	0.334	5.6	LOS A	2.1	52.1	0.14	0.04	22.7
16	R2	45	2.0	0.334	5.6	LOS A	2.1	52.1	0.14	0.04	22.4
Approach		459	2.0	0.334	5.6	LOS A	2.1	52.1	0.14	0.04	22.7
North: Jay Street											
7	L2	45	2.0	0.068	4.6	LOS A	0.3	7.1	0.49	0.38	22.8
4	T1	14	2.0	0.068	4.6	LOS A	0.3	7.1	0.49	0.38	22.9
14	R2	3	2.0	0.068	4.6	LOS A	0.3	7.1	0.49	0.38	22.6
Approach		62	2.0	0.068	4.6	LOS A	0.3	7.1	0.49	0.38	22.8
West: Sunset Ave											
5	L2	1	2.0	0.144	4.9	LOS A	0.6	16.2	0.46	0.34	23.2
2	T1	130	2.0	0.144	4.9	LOS A	0.6	16.2	0.46	0.34	23.3
12	R2	15	2.0	0.144	4.9	LOS A	0.6	16.2	0.46	0.34	23.0
Approach		146	2.0	0.144	4.9	LOS A	0.6	16.2	0.46	0.34	23.2
All Vehicles		926	2.0	0.334	5.3	LOS A	2.1	52.1	0.28	0.17	22.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	75.5
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	13	354	113	100	322	6	5	16	12	109	20	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	10	6	0	13	0	0	0	0	10	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	488	159	135	448	8	7	22	16	157	27	167
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	122	40	34	112	2	2	6	4	39	7	42
Total Analysis Volume [veh/h]	18	488	159	135	448	8	7	22	16	157	27	167
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	22.20	16.85	0.35	1.64	1.83
95th-Percentile Queue Length [ft]	555.08	421.19	8.82	40.89	45.73
Approach Delay [s/veh]	109.81	77.62	12.47	15.04	
Approach LOS	F	F	B	C	
Intersection Delay [s/veh]	75.51				
Intersection LOS	F				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	11.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	3	37	41	3	56	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	43	0	0	64
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	50	98	4	76	113
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	13	25	1	19	28
Total Analysis Volume [veh/h]	4	50	98	4	76	113
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.05	0.00	0.00	0.05	0.00
d_M, Delay for Movement [s/veh]	11.25	9.01	0.00	0.00	7.55	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.19	0.19	0.00	0.00	0.43	0.43
95th-Percentile Queue Length [ft]	4.69	4.69	0.00	0.00	10.87	10.87
d_A, Approach Delay [s/veh]	9.18		0.00		3.03	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.10					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	35.4
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.484

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	18	340	315	69	68	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	41	0	0	23	16	27
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	65	459	425	116	108	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	115	106	29	27	11
Total Analysis Volume [veh/h]	65	459	425	116	108	42
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.06	0.00	0.00	0.00	0.48	0.07
d_M, Delay for Movement [s/veh]	8.74	0.00	0.00	0.00	35.44	11.65
Movement LOS	A	A	A	A	E	B
95th-Percentile Queue Length [veh]	2.98	2.98	0.00	0.00	2.41	0.23
95th-Percentile Queue Length [ft]	74.51	74.51	0.00	0.00	60.34	5.80
d_A, Approach Delay [s/veh]	1.08		0.00		28.78	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	4.02					
Intersection LOS	E					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	96.4
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name				K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name				K St			11th St			11th St		
Base Volume Input [veh/h]	96	283	37	54	233	7	21	104	84	52	121	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	33	0	5	22	0	0	0	0	0	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	130	415	50	78	337	9	28	140	113	70	163	70
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	104	13	20	84	2	7	35	28	18	41	18
Total Analysis Volume [veh/h]	130	415	50	78	337	9	28	140	113	70	163	70
Pedestrian Volume [ped/h]	17			18			5			12		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	26.94	11.29	4.71	5.55
95th-Percentile Queue Length [ft]	673.49	282.22	117.81	138.81
Approach Delay [s/veh]	189.02	59.58	26.92	30.38
Approach LOS	F	F	D	D
Intersection Delay [s/veh]	96.38			
Intersection LOS	F			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	11.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	0	0	2	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	69	66	39	34	1	1	34	9	63	39	78
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	17	17	10	9	0	0	9	2	16	10	20
Total Analysis Volume [veh/h]	5	69	66	39	34	1	1	34	9	63	39	78
Pedestrian Volume [ped/h]	4			3			3			7		

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Version 4.00-02

Intersection Settings

Priority Scheme	Free			Free			Stop			Stop		
Flared Lane							Yes			Yes		
Storage Area [veh]	0			0			1			1		
Two-Stage Gap Acceptance							No			No		
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.06	0.01	0.10	0.06	0.08
d_M, Delay for Movement [s/veh]	7.30	0.00	0.00	7.59	0.00	0.00	11.68	11.16	8.81	11.25	11.24	9.47
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.29	0.29	0.29	0.16	0.16	0.16	0.18	0.18	0.18	0.57	0.57	0.57
95th-Percentile Queue Length [ft]	7.34	7.34	7.34	4.09	4.09	4.09	4.55	4.55	4.55	14.19	14.19	14.19
d_A, Approach Delay [s/veh]	0.26			4.00			10.69			10.48		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	6.14											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.4
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.017

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	11	26	9	3	28	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	0	0	2	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	38	12	4	40	14
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	10	3	1	10	4
Total Analysis Volume [veh/h]	15	38	12	4	40	14
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.04	0.00	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	9.35	8.58	0.00	0.00	7.31	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.17	0.17	0.00	0.00	0.10	0.10
95th-Percentile Queue Length [ft]	4.19	4.19	0.00	0.00	2.62	2.62
d_A, Approach Delay [s/veh]	8.80		0.00		5.41	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.17					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 13: Foster Avenue/ Creekside Prj Driveway

Control Type:	Two-way stop	Delay (sec / veh):	9.5
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.051

Intersection Setup

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	0	0	0	40	38	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	43	2	3	0	0	64
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	43	2	3	54	51	64
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	1	1	14	13	16
Total Analysis Volume [veh/h]	43	2	3	54	51	64
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.48	8.92	7.45	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.17	0.17	0.12	0.12	0.00	0.00
95th-Percentile Queue Length [ft]	4.17	4.17	3.02	3.02	0.00	0.00
d_A, Approach Delay [s/veh]	9.46		0.39		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.06					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.016

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.00	1.35	1.35	1.00	1.35	1.00	1.35	1.35	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	0	7	248	0	8	0	11	134	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	0	2	62	0	2	0	3	34	0	0	0
Total Analysis Volume [veh/h]	7	0	7	248	0	8	0	11	134	0	0	0
Pedestrian Volume [ped/h]	0			0			9			9		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Stop		Free	
Flared Lane	Yes				No			
Storage Area [veh]	1		0		0		0	
Two-Stage Gap Acceptance	No				No			
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.13	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.57	0.00	9.70	0.00	0.00	0.00	0.00	10.88	8.97	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.49	0.49	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	0.82	0.00	0.82	0.00	0.00	0.00	0.00	12.37	12.37	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.14			0.00			9.11			0.00		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	3.53											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	13.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.222

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	87	27	89	19	8	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	117	36	120	26	11	244
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	9	30	7	3	61
Total Analysis Volume [veh/h]	117	36	120	26	11	244
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.22	0.03	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	13.23	10.50	7.50	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.85	0.85	0.64	0.64
95th-Percentile Queue Length [ft]	0.00	0.00	21.16	21.16	15.94	15.94
d_A, Approach Delay [s/veh]	0.00		12.74		0.32	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	3.51					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	17.2
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	95	95	183	225	158	392
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	129	128	247	304	213	532
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	32	62	76	53	133
Total Analysis Volume [veh/h]	129	128	247	304	213	532
Pedestrian Volume [ped/h]	75		0		0	

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.60	2.91	3.60	2.24	2.44	2.44
95th-Percentile Queue Length [ft]	89.97	72.70	90.06	56.02	61.05	61.05
Approach Delay [s/veh]	21.81	18.17		14.80		
Approach LOS	C	C		B		
Intersection Delay [s/veh]	17.15					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	120.6
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.867

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	74	0	118	0	0	0	93	430	0	0	251	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.00	1.00	1.00	1.35	1.35	1.00	1.00	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	6	3	0	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	100	0	159	0	0	0	132	584	0	0	340	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	0	40	0	0	0	33	146	0	0	85	23
Total Analysis Volume [veh/h]	100	0	159	0	0	0	132	584	0	0	340	90
Pedestrian Volume [ped/h]	75			0			0			0		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.87	0.00	0.31	0.00	0.00	0.00	0.12	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	120.64	35.60	13.33	0.00	0.00	0.00	8.61	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	E	B				A	A			A	A
95th-Percentile Queue Length [veh]	5.24	0.55	0.55	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	131.00	13.66	13.66	0.00	0.00	0.00	9.89	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	54.76			0.00			1.59			0.00		
Approach LOS	F			A			A			A		
d_I, Intersection Delay [s/veh]	10.90											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	20.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	35	7	11	311	391	190	128	201	46	90	123	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	3	0	9	0	0	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	47	9	15	420	528	260	173	280	62	122	167	151
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	12	2	4	105	132	65	43	70	16	31	42	38
Total Analysis Volume [veh/h]	47	9	15	420	528	260	173	280	62	122	167	151
Pedestrian Volume [ped/h]	60			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.38	8.81	2.78	2.78	2.29	1.87	3.97	0.42	1.20	1.74	1.34
95th-Percentile Queue Length [ft]	9.54	220.3	69.58	69.58	57.23	46.83	99.24	10.54	29.91	43.43	33.47
Approach Delay [s/veh]	9.48	23.74				18.75			14.76		
Approach LOS	A	C				C			B		
Intersection Delay [s/veh]	20.37										
Intersection LOS	C										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset AM Future + Creekside

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	35	2.0	0.264	5.9	LOS A	1.3	33.5	0.46	0.34	22.8
8	T1	1	2.0	0.264	5.9	LOS A	1.3	33.5	0.46	0.34	22.8
18	R2	247	2.0	0.264	5.9	LOS A	1.3	33.5	0.46	0.34	22.5
Approach		283	2.0	0.264	5.9	LOS A	1.3	33.5	0.46	0.34	22.6
East: Sunset Ave											
1	L2	251	2.0	0.349	5.8	LOS A	2.2	55.3	0.19	0.07	22.7
6	T1	216	2.0	0.349	5.8	LOS A	2.2	55.3	0.19	0.07	22.7
16	R2	7	2.0	0.349	5.8	LOS A	2.2	55.3	0.19	0.07	22.4
Approach		474	2.0	0.349	5.8	LOS A	2.2	55.3	0.19	0.07	22.7
North: Jay Street											
7	L2	32	2.0	0.047	4.7	LOS A	0.2	4.8	0.52	0.41	22.7
4	T1	7	2.0	0.047	4.7	LOS A	0.2	4.8	0.52	0.41	22.8
14	R2	1	2.0	0.047	4.7	LOS A	0.2	4.8	0.52	0.41	22.5
Approach		40	2.0	0.047	4.7	LOS A	0.2	4.8	0.52	0.41	22.7
West: Sunset Ave											
5	L2	1	2.0	0.233	5.6	LOS A	1.1	28.7	0.47	0.36	23.0
2	T1	230	2.0	0.233	5.6	LOS A	1.1	28.7	0.47	0.36	23.1
12	R2	14	2.0	0.233	5.6	LOS A	1.1	28.7	0.47	0.36	22.8
Approach		245	2.0	0.233	5.6	LOS A	1.1	28.7	0.47	0.36	23.1
All Vehicles		1042	2.0	0.349	5.7	LOS A	2.2	55.3	0.34	0.22	22.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	51.4
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd						Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd						Foster Ave		
Base Volume Input [veh/h]	11	201	101	120	251	43	36	26	16	159	31	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	0	0	0	0	5	11	9	32	0	4	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	271	136	162	339	63	60	44	54	215	46	88
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	68	34	41	85	16	15	11	14	54	12	22
Total Analysis Volume [veh/h]	31	271	136	162	339	63	60	44	54	215	46	88
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	8.72	17.88	1.64	2.87	1.17
95th-Percentile Queue Length [ft]	217.88	446.95	41.04	71.70	29.19
Approach Delay [s/veh]	37.00	93.40	15.99	17.58	
Approach LOS	E	F	C	C	
Intersection Delay [s/veh]	51.39				
Intersection LOS	F				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	11.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	1	83	3	3	122	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	112	4	4	165	4
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	28	1	1	41	1
Total Analysis Volume [veh/h]	1	112	4	4	165	4
Pedestrian Volume [ped/h]	9		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.11	0.00	0.00	0.10	0.00
d_M, Delay for Movement [s/veh]	11.67	8.83	0.00	0.00	7.53	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.36	0.36	0.00	0.00	0.36	0.36
95th-Percentile Queue Length [ft]	9.04	9.04	0.00	0.00	8.92	8.92
d_A, Approach Delay [s/veh]	8.85		0.00		7.35	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.73					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	23.5
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.344

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	13	247	321	104	75	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	16	32	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	349	465	140	101	16
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	87	116	35	25	4
Total Analysis Volume [veh/h]	18	349	465	140	101	16
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.00	0.00	0.34	0.03
d_M, Delay for Movement [s/veh]	8.77	0.00	0.00	0.00	23.55	11.80
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	1.78	1.78	0.00	0.00	1.48	0.09
95th-Percentile Queue Length [ft]	44.39	44.39	0.00	0.00	37.03	2.26
d_A, Approach Delay [s/veh]	0.43		0.00		21.94	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	2.50					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	25.8
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes		

Intersection Setup

Name	K St			K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	K St			K St			11th St			11th St		
Base Volume Input [veh/h]	109	143	16	37	182	6	38	153	112	32	73	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	13	0	6	26	0	0	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	147	206	22	56	272	8	51	207	151	43	99	39
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	52	6	14	68	2	13	52	38	11	25	10
Total Analysis Volume [veh/h]	147	206	22	56	272	8	51	207	151	43	99	39
Pedestrian Volume [ped/h]	9			9			6			6		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	6.23	4.96	7.12	1.82
95th-Percentile Queue Length [ft]	155.71	123.94	178.12	45.41
Approach Delay [s/veh]	27.83	23.75	30.10	15.57
Approach LOS	D	C	D	C
Intersection Delay [s/veh]	25.79			
Intersection LOS	D			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	13.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	3	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	77	73	85	85	3	5	31	8	70	24	61
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	19	18	21	21	1	1	8	2	18	6	15
Total Analysis Volume [veh/h]	3	77	73	85	85	3	5	31	8	70	24	61
Pedestrian Volume [ped/h]	5			5			4			4		

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Intersection Settings

Priority Scheme	Free			Free			Stop			Stop		
Flared Lane							Yes			Yes		
Storage Area [veh]	0			0			1			1		
Two-Stage Gap Acceptance							No			No		
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.06	0.00	0.00	0.01	0.06	0.01	0.14	0.05	0.07
d_M, Delay for Movement [s/veh]	7.41	0.00	0.00	7.69	0.00	0.00	13.39	12.90	9.27	13.29	13.09	9.93
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.34	0.34	0.34	0.41	0.41	0.41	0.24	0.24	0.24	0.69	0.69	0.69
95th-Percentile Queue Length [ft]	8.52	8.52	8.52	10.37	10.37	10.37	6.03	6.03	6.03	17.29	17.29	17.29
d_A, Approach Delay [s/veh]	0.15			3.78			12.29			11.93		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	5.84											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	4	53	5	3	75	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	73	7	4	104	7
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	18	2	1	26	2
Total Analysis Volume [veh/h]	5	73	7	4	104	7
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.07	0.00	0.00	0.06	0.00
d_M, Delay for Movement [s/veh]	10.32	8.64	0.00	0.00	7.39	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.24	0.24	0.00	0.00	0.22	0.22
95th-Percentile Queue Length [ft]	6.07	6.07	0.00	0.00	5.55	5.55
d_A, Approach Delay [s/veh]	8.74		0.00		6.93	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.25					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 13: Foster Ave/ Project Driveway

Control Type:	Two-way stop	Delay (sec / veh):	9.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.066

Intersection Setup

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	0	0	0	58	81	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	52	3	1	0	0	25
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	3	1	78	109	25
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	1	0	20	27	6
Total Analysis Volume [veh/h]	52	3	1	78	109	25
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.92	9.21	7.48	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.22	0.22	0.17	0.17	0.00	0.00
95th-Percentile Queue Length [ft]	5.57	5.57	4.32	4.32	0.00	0.00
d_A, Approach Delay [s/veh]	9.88		0.09		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.05					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 14: Foster Ave/Q St

Control Type:	Two-way stop	Delay (sec / veh):	10.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.006

Intersection Setup

Name	Q St		Foster Ave			
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Q St		Foster Ave			
Base Volume Input [veh/h]	3	0	54	3	3	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	52	0	0	25
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	0	125	4	4	125
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	31	1	1	31
Total Analysis Volume [veh/h]	4	0	125	4	4	125
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.98	8.93	0.00	0.00	7.48	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.02	0.02	0.00	0.00	0.29	0.29
95th-Percentile Queue Length [ft]	0.42	0.42	0.00	0.00	7.27	7.27
d_A, Approach Delay [s/veh]	9.98		0.00		0.23	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.27					
Intersection LOS	A					

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Intersection Level Of Service Report

Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	10.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.015

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.00	1.35	1.35	1.00	1.35	1.00	1.35	1.35	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	30	0	28	186	0	14	0	11	211	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	0	7	47	0	4	0	3	53	0	0	0
Total Analysis Volume [veh/h]	30	0	28	186	0	14	0	11	211	0	0	0
Pedestrian Volume [ped/h]	0			0			11			11		

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Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.04	0.00	0.03	0.00	0.00	0.00	0.00	0.01	0.20	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.26	0.00	9.47	0.00	0.00	0.00	0.00	10.83	9.34	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	A			
95th-Percentile Queue Length [veh]	0.13	0.00	0.13	0.00	0.00	0.00	0.00	0.81	0.81	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	3.35	0.00	3.35	0.00	0.00	0.00	0.00	20.28	20.28	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.88			0.00			9.42			0.00		
Approach LOS	A			A			A			A		
d_I, Intersection Delay [s/veh]	5.55											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	13.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.193

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	160	93	68	25	18	129
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	216	126	92	34	24	174
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	54	32	23	9	6	44
Total Analysis Volume [veh/h]	216	126	92	34	24	174
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.19	0.04	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	13.89	11.06	7.86	0.00
Movement LOS	A	A	B	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.71	0.71	0.54	0.54
95th-Percentile Queue Length [ft]	0.00	0.00	17.78	17.78	13.62	13.62
d_A, Approach Delay [s/veh]	0.00		13.12		0.95	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	2.77					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	89.1
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	280	155	170	243	307	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	3	0	0	0	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	381	209	230	328	414	246
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	95	52	58	82	104	62
Total Analysis Volume [veh/h]	381	209	230	328	414	246
Pedestrian Volume [ped/h]	147		0		0	

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	28.23	2.97	5.13	10.36	0.89	0.89
95th-Percentile Queue Length [ft]	705.85	74.27	128.13	258.90	22.25	22.25
Approach Delay [s/veh]	209.91	22.78		37.23		
Approach LOS	F	C		E		
Intersection Delay [s/veh]	89.12					
Intersection LOS	F					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	315.5
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.418

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	103	4	254	0	0	0	114	236	0	0	282	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.00	1.00	1.00	1.35	1.35	1.00	1.00	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	4	2	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	139	5	343	0	0	0	158	321	0	0	384	325
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	1	86	0	0	0	40	80	0	0	96	81
Total Analysis Volume [veh/h]	139	5	343	0	0	0	158	321	0	0	384	325
Pedestrian Volume [ped/h]	146			0			0			0		

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Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	1.42	0.06	0.48	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	315.47	48.68	12.02	0.00	0.00	0.00	9.92	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	E	B				A	A			A	A
95th-Percentile Queue Length [veh]	10.22	1.21	1.08	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	255.54	30.24	26.91	0.00	0.00	0.00	16.08	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	99.01			0.00			3.27			0.00		
Approach LOS	F			A			A			A		
d_I, Intersection Delay [s/veh]	29.72											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	13.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	75	30	26	149	279	101	67	175	60	111	152	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	7	0	6	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	101	41	35	201	377	143	90	242	81	150	208	157
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	25	10	9	50	94	36	23	61	20	38	52	39
Total Analysis Volume [veh/h]	101	41	35	201	377	143	90	242	81	150	208	157
Pedestrian Volume [ped/h]	112			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.07	1.94	1.59	1.59	0.95	0.67	2.47	0.50	1.32	1.96	1.14
95th-Percentile Queue Length [ft]	26.85	48.58	39.87	39.87	23.72	16.82	61.63	12.40	33.10	49.08	28.52
Approach Delay [s/veh]	10.40	13.17				13.72			13.36		
Approach LOS	B	B				B			B		
Intersection Delay [s/veh]	13.08										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset PM Future + Creekside

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	11	2.0	0.221	5.1	LOS A	1.1	27.8	0.37	0.23	23.0
8	T1	12	2.0	0.221	5.1	LOS A	1.1	27.8	0.37	0.23	23.1
18	R2	236	2.0	0.221	5.1	LOS A	1.1	27.8	0.37	0.23	22.8
Approach		259	2.0	0.221	5.1	LOS A	1.1	27.8	0.37	0.23	22.8
East: Sunset Ave											
1	L2	261	2.0	0.334	5.6	LOS A	2.1	52.1	0.14	0.04	22.7
6	T1	153	2.0	0.334	5.6	LOS A	2.1	52.1	0.14	0.04	22.7
16	R2	45	2.0	0.334	5.6	LOS A	2.1	52.1	0.14	0.04	22.4
Approach		459	2.0	0.334	5.6	LOS A	2.1	52.1	0.14	0.04	22.7
North: Jay Street											
7	L2	45	2.0	0.068	4.6	LOS A	0.3	7.1	0.49	0.38	22.8
4	T1	14	2.0	0.068	4.6	LOS A	0.3	7.1	0.49	0.38	22.9
14	R2	3	2.0	0.068	4.6	LOS A	0.3	7.1	0.49	0.38	22.6
Approach		62	2.0	0.068	4.6	LOS A	0.3	7.1	0.49	0.38	22.8
West: Sunset Ave											
5	L2	1	2.0	0.144	4.9	LOS A	0.6	16.2	0.46	0.34	23.2
2	T1	130	2.0	0.144	4.9	LOS A	0.6	16.2	0.46	0.34	23.3
12	R2	15	2.0	0.144	4.9	LOS A	0.6	16.2	0.46	0.34	23.0
Approach		146	2.0	0.144	4.9	LOS A	0.6	16.2	0.46	0.34	23.2
All Vehicles		926	2.0	0.334	5.3	LOS A	2.1	52.1	0.28	0.17	22.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	99.8
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	20	329	105	100	303	25	30	24	18	102	27	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	41	0	0	0	0	13	10	6	27	0	10	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	68	444	142	135	409	47	51	38	51	138	46	167
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	111	36	34	102	12	13	10	13	35	12	42
Total Analysis Volume [veh/h]	68	444	142	135	409	47	51	38	51	138	46	167
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	25.93	20.44	1.44	1.47	2.37
95th-Percentile Queue Length [ft]	648.15	510.90	36.07	36.64	59.22
Approach Delay [s/veh]	150.93	112.47	15.82	16.51	
Approach LOS	F	F	C	C	
Intersection Delay [s/veh]	99.76				
Intersection LOS	F				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	9.7
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	3	37	3	3	56	2
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	50	4	4	76	3
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	13	1	1	19	1
Total Analysis Volume [veh/h]	4	50	4	4	76	3
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.05	0.00	0.00	0.05	0.00
d_M, Delay for Movement [s/veh]	9.74	8.53	0.00	0.00	7.34	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.16	0.16	0.00	0.00	0.15	0.15
95th-Percentile Queue Length [ft]	4.07	4.07	0.00	0.00	3.86	3.86
d_A, Approach Delay [s/veh]	8.62		0.00		7.06	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.26					
Intersection LOS	A					

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Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	21.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.181

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	11	340	315	42	35	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	41	27	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	500	452	57	47	7
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	125	113	14	12	2
Total Analysis Volume [veh/h]	15	500	452	57	47	7
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.00	0.00	0.18	0.01
d_M, Delay for Movement [s/veh]	8.46	0.00	0.00	0.00	21.85	11.22
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	2.74	2.74	0.00	0.00	0.65	0.04
95th-Percentile Queue Length [ft]	68.61	68.61	0.00	0.00	16.14	0.91
d_A, Approach Delay [s/veh]	0.25		0.00		20.47	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	1.14					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	96.4
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name				K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name				K St			11th St			11th St		
Base Volume Input [veh/h]	96	283	37	54	233	7	21	104	84	52	121	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	33	0	5	22	0	0	0	0	0	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	130	415	50	78	337	9	28	140	113	70	163	70
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	104	13	20	84	2	7	35	28	18	41	18
Total Analysis Volume [veh/h]	130	415	50	78	337	9	28	140	113	70	163	70
Pedestrian Volume [ped/h]	17			18			5			12		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	26.94	11.29	4.71	5.55
95th-Percentile Queue Length [ft]	673.49	282.22	117.81	138.81
Approach Delay [s/veh]	189.02	59.58	26.92	30.38
Approach LOS	F	F	D	D
Intersection Delay [s/veh]	96.38			
Intersection LOS	F			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	11.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	0	0	2	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	69	66	39	34	1	1	34	9	63	39	78
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	17	17	10	9	0	0	9	2	16	10	20
Total Analysis Volume [veh/h]	5	69	66	39	34	1	1	34	9	63	39	78
Pedestrian Volume [ped/h]	4			3			3			7		

Intersection Settings

Priority Scheme	Free			Free			Stop			Stop		
Flared Lane							Yes			Yes		
Storage Area [veh]	0			0			1			1		
Two-Stage Gap Acceptance							No			No		
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.06	0.01	0.10	0.06	0.08
d_M, Delay for Movement [s/veh]	7.30	0.00	0.00	7.59	0.00	0.00	11.68	11.16	8.81	11.25	11.24	9.47
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.29	0.29	0.29	0.16	0.16	0.16	0.18	0.18	0.18	0.57	0.57	0.57
95th-Percentile Queue Length [ft]	7.34	7.34	7.34	4.09	4.09	4.09	4.55	4.55	4.55	14.19	14.19	14.19
d_A, Approach Delay [s/veh]	0.26			4.00			10.69			10.48		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	6.14											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.4
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.017

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	11	26	9	3	28	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	0	0	2	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	38	12	4	40	14
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	10	3	1	10	4
Total Analysis Volume [veh/h]	15	38	12	4	40	14
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.04	0.00	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	9.35	8.58	0.00	0.00	7.31	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.17	0.17	0.00	0.00	0.10	0.10
95th-Percentile Queue Length [ft]	4.19	4.19	0.00	0.00	2.62	2.62
d_A, Approach Delay [s/veh]	8.80		0.00		5.41	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.17					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 13: Foster Avenue/ Creekside Prj Driveway

Control Type:	Two-way stop	Delay (sec / veh):	9.5
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.051

Intersection Setup

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	0	0	0	40	38	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	43	2	3	0	0	64
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	43	2	3	54	51	64
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	1	1	14	13	16
Total Analysis Volume [veh/h]	43	2	3	54	51	64
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.48	8.92	7.45	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.17	0.17	0.12	0.12	0.00	0.00
95th-Percentile Queue Length [ft]	4.17	4.17	3.02	3.02	0.00	0.00
d_A, Approach Delay [s/veh]	9.46		0.39		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.06					
Intersection LOS	A					

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Intersection Level Of Service Report
Intersection 14: Q St/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.6
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	Q St		Foster Ave		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Q St		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	2	0	38	3	1	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	43	0	0	64
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	0	94	4	1	109
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	24	1	0	27
Total Analysis Volume [veh/h]	3	0	94	4	1	109
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.63	8.77	0.00	0.00	7.41	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.01	0.01	0.00	0.00	0.24	0.24
95th-Percentile Queue Length [ft]	0.29	0.29	0.00	0.00	5.95	5.95
d_A, Approach Delay [s/veh]	9.63		0.00		0.07	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.17					
Intersection LOS	A					

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Intersection Level Of Service Report

Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	11.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.046

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.00	1.35	1.35	1.00	1.35	1.00	1.35	1.35	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	15	0	83	0	0	4	0	20	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	0	90	248	0	12	0	31	134	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	0	23	62	0	3	0	8	34	0	0	0
Total Analysis Volume [veh/h]	22	0	90	248	0	12	0	31	134	0	0	0
Pedestrian Volume [ped/h]	0			0			9			9		

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Intersection Settings

Priority Scheme	Stop		Free		Stop		Free	
Flared Lane	Yes				No			
Storage Area [veh]	1		0		0		0	
Two-Stage Gap Acceptance	No				No			
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.12	0.00	0.00	0.00	0.00	0.05	0.13	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	11.05	0.00	10.18	0.00	0.00	0.00	0.00	11.10	9.16	0.00	0.00	0.00
Movement LOS	B		B	A		A		B	A			
95th-Percentile Queue Length [veh]	0.40	0.00	0.40	0.00	0.00	0.00	0.00	0.62	0.62	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	9.90	0.00	9.90	0.00	0.00	0.00	0.00	15.47	15.47	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.35			0.00			9.53			0.00		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	5.09											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	15.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.254

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	87	27	89	19	8	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	20	0	0	0	0	83
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	137	36	120	26	11	327
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	34	9	30	7	3	82
Total Analysis Volume [veh/h]	137	36	120	26	11	327
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.25	0.03	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	15.04	11.45	7.55	0.00
Movement LOS	A	A	C	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	1.08	1.08	0.93	0.93
95th-Percentile Queue Length [ft]	0.00	0.00	26.90	26.90	23.16	23.16
d_A, Approach Delay [s/veh]	0.00		14.40		0.25	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	3.33					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	20.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	95	95	183	225	158	392
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	11	18	73	10	2	30
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	139	146	320	314	215	559
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	37	80	79	54	140
Total Analysis Volume [veh/h]	139	146	320	314	215	559
Pedestrian Volume [ped/h]	75		0		0	

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.87	5.25	4.16	2.43	2.89	2.89
95th-Percentile Queue Length [ft]	121.69	131.13	103.95	60.72	72.22	72.22
Approach Delay [s/veh]	27.57	23.54		16.30		
Approach LOS	D	C		C		
Intersection Delay [s/veh]	20.91					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	211.6
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.143

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	74	0	118	0	0	0	93	430	0	0	251	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.00	1.00	1.00	1.35	1.35	1.00	1.00	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	0	2	0	0	0	19	30	0	0	21	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	116	0	161	0	0	0	145	611	0	0	360	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	0	40	0	0	0	36	153	0	0	90	23
Total Analysis Volume [veh/h]	116	0	161	0	0	0	145	611	0	0	360	90
Pedestrian Volume [ped/h]	75			0			0			0		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	1.14	0.00	0.33	0.00	0.00	0.00	0.13	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	211.57	39.37	13.71	0.00	0.00	0.00	8.73	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	E	B				A	A			A	A
95th-Percentile Queue Length [veh]	7.57	0.58	0.58	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	189.14	14.45	14.45	0.00	0.00	0.00	11.22	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	96.56			0.00			1.67			0.00		
Approach LOS	F			A			A			A		
d_I, Intersection Delay [s/veh]	18.89											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	23.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	35	7	11	311	391	190	128	201	46	90	123	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	18	0	0	0	0	13	29	49	19	0	27	10
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	65	9	15	420	528	270	202	320	81	122	193	161
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	2	4	105	132	68	51	80	20	31	48	40
Total Analysis Volume [veh/h]	65	9	15	420	528	270	202	320	81	122	193	161
Pedestrian Volume [ped/h]	60			0			0			0		

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Version 4.00-02

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.49	9.69	3.01	3.01	2.65	2.57	5.78	0.61	1.29	2.39	1.60
95th-Percentile Queue Length [ft]	12.23	242.1	75.13	75.13	66.28	64.32	144.61	15.19	32.23	59.73	40.12
Approach Delay [s/veh]	9.64	26.77				23.85			16.71		
Approach LOS	A	D				C			C		
Intersection Delay [s/veh]	23.39										
Intersection LOS	C										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset AM Future + All Projects

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	35	2.0	0.332	6.8	LOS A	1.8	44.5	0.51	0.40	22.6
8	T1	2	2.0	0.332	6.8	LOS A	1.8	44.5	0.51	0.40	22.6
18	R2	311	2.0	0.332	6.8	LOS A	1.8	44.5	0.51	0.40	22.3
Approach		348	2.0	0.332	6.8	LOS A	1.8	44.5	0.51	0.40	22.4
East: Sunset Ave											
1	L2	299	2.0	0.390	6.3	LOS A	2.6	65.3	0.20	0.07	22.5
6	T1	216	2.0	0.390	6.3	LOS A	2.6	65.3	0.20	0.07	22.6
16	R2	13	2.0	0.390	6.3	LOS A	2.6	65.3	0.20	0.07	22.3
Approach		528	2.0	0.390	6.3	LOS A	2.6	65.3	0.20	0.07	22.5
North: Jay Street											
7	L2	56	2.0	0.089	5.4	LOS A	0.4	9.2	0.55	0.48	22.6
4	T1	15	2.0	0.089	5.4	LOS A	0.4	9.2	0.55	0.48	22.6
14	R2	1	2.0	0.089	5.4	LOS A	0.4	9.2	0.55	0.48	22.4
Approach		72	2.0	0.089	5.4	LOS A	0.4	9.2	0.55	0.48	22.6
West: Sunset Ave											
5	L2	1	2.0	0.253	6.2	LOS A	1.2	30.7	0.53	0.44	22.9
2	T1	230	2.0	0.253	6.2	LOS A	1.2	30.7	0.53	0.44	22.9
12	R2	14	2.0	0.253	6.2	LOS A	1.2	30.7	0.53	0.44	22.7
Approach		245	2.0	0.253	6.2	LOS A	1.2	30.7	0.53	0.44	22.9
All Vehicles		1193	2.0	0.390	6.4	LOS A	2.6	65.3	0.38	0.27	22.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	52.5
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	3	232	116	120	290	3	5	11	8	185	5	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	26	13	20	0	0	0	0	22	0	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	328	183	175	412	4	7	15	11	272	7	101
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	82	46	44	103	1	2	4	3	68	2	25
Total Analysis Volume [veh/h]	4	328	183	175	412	4	7	15	11	272	7	101
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	10.78	17.65	0.25	4.04	0.78
95th-Percentile Queue Length [ft]	269.50	441.36	6.31	100.95	19.62
Approach Delay [s/veh]	42.10	84.89	12.22	19.78	
Approach LOS	E	F	B	C	
Intersection Delay [s/veh]	52.52				
Intersection LOS	F				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	14.6
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	1	83	57	3	122	80
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	52	0	0	25
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	112	129	4	165	133
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	28	32	1	41	33
Total Analysis Volume [veh/h]	1	112	129	4	165	133
Pedestrian Volume [ped/h]	9		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.12	0.00	0.00	0.12	0.00
d_M, Delay for Movement [s/veh]	14.57	9.59	0.00	0.00	7.85	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.43	0.43	0.00	0.00	0.79	0.79
95th-Percentile Queue Length [ft]	10.85	10.85	0.00	0.00	19.66	19.66
d_A, Approach Delay [s/veh]	9.63		0.00		4.35	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.38					
Intersection LOS	B					

APPENDIX T.1

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Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	55.5
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.760

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	21	247	321	173	121	20
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	22	37	9	20	32
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	44	355	470	243	183	59
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	89	118	61	46	15
Total Analysis Volume [veh/h]	44	355	470	243	183	59
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.00	0.00	0.00	0.76	0.12
d_M, Delay for Movement [s/veh]	9.27	0.00	0.00	0.00	55.49	13.04
Movement LOS	A	A	A	A	F	B
95th-Percentile Queue Length [veh]	2.36	2.36	0.00	0.00	5.42	0.39
95th-Percentile Queue Length [ft]	59.05	59.05	0.00	0.00	135.52	9.82
d_A, Approach Delay [s/veh]	1.02		0.00		45.14	
Approach LOS	A		A		E	
d_I, Intersection Delay [s/veh]	8.37					
Intersection LOS	F					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	32.9
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes		

Intersection Setup

Name	K St			K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	K St			K St			11th St			11th St		
Base Volume Input [veh/h]	109	143	16	37	182	6	38	153	112	32	73	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	35	0	6	63	0	0	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	147	228	22	56	309	8	51	207	151	43	99	39
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	57	6	14	77	2	13	52	38	11	25	10
Total Analysis Volume [veh/h]	147	228	22	56	309	8	51	207	151	43	99	39
Pedestrian Volume [ped/h]	9			9			6			6		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	8.01	6.95	8.18	2.02
95th-Percentile Queue Length [ft]	200.29	173.86	204.45	50.43
Approach Delay [s/veh]	36.80	32.38	36.59	17.10
Approach LOS	E	D	E	C
Intersection Delay [s/veh]	32.90			
Intersection LOS	D			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	13.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	3	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	77	73	85	85	3	5	31	8	70	24	61
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	19	18	21	21	1	1	8	2	18	6	15
Total Analysis Volume [veh/h]	3	77	73	85	85	3	5	31	8	70	24	61
Pedestrian Volume [ped/h]	5			5			4			4		

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Version 4.00-02

Intersection Settings

Priority Scheme	Free			Free			Stop			Stop		
Flared Lane							Yes			Yes		
Storage Area [veh]	0			0			1			1		
Two-Stage Gap Acceptance							No			No		
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.06	0.00	0.00	0.01	0.06	0.01	0.14	0.05	0.07
d_M, Delay for Movement [s/veh]	7.41	0.00	0.00	7.69	0.00	0.00	13.39	12.90	9.27	13.29	13.09	9.93
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.34	0.34	0.34	0.41	0.41	0.41	0.24	0.24	0.24	0.69	0.69	0.69
95th-Percentile Queue Length [ft]	8.52	8.52	8.52	10.37	10.37	10.37	6.03	6.03	6.03	17.29	17.29	17.29
d_A, Approach Delay [s/veh]	0.15			3.78			12.29			11.93		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	5.84											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	4	53	5	3	75	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	73	7	4	104	7
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	18	2	1	26	2
Total Analysis Volume [veh/h]	5	73	7	4	104	7
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.07	0.00	0.00	0.06	0.00
d_M, Delay for Movement [s/veh]	10.32	8.64	0.00	0.00	7.39	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.24	0.24	0.00	0.00	0.22	0.22
95th-Percentile Queue Length [ft]	6.07	6.07	0.00	0.00	5.55	5.55
d_A, Approach Delay [s/veh]	8.74		0.00		6.93	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.25					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 13: Foster Ave/ Project Driveway

Control Type:	Two-way stop	Delay (sec / veh):	9.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.066

Intersection Setup

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	0	0	0	58	81	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	52	3	1	0	0	25
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	3	1	78	109	25
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	1	0	20	27	6
Total Analysis Volume [veh/h]	52	3	1	78	109	25
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.92	9.21	7.48	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.22	0.22	0.17	0.17	0.00	0.00
95th-Percentile Queue Length [ft]	5.57	5.57	4.32	4.32	0.00	0.00
d_A, Approach Delay [s/veh]	9.88		0.09		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.05					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	11.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.132

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.00	1.35	1.35	1.00	1.35	1.00	1.35	1.35	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	0	44	0	0	15	0	84	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	0	72	186	0	29	0	95	211	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	0	18	47	0	7	0	24	53	0	0	0
Total Analysis Volume [veh/h]	38	0	72	186	0	29	0	95	211	0	0	0
Pedestrian Volume [ped/h]	0			0			11			11		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.00	0.09	0.00	0.00	0.00	0.00	0.13	0.20	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.46	0.00	9.67	0.00	0.00	0.00	0.00	11.91	10.32	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	B			
95th-Percentile Queue Length [veh]	0.29	0.00	0.29	0.00	0.00	0.00	0.00	1.46	1.46	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	7.21	0.00	7.21	0.00	0.00	0.00	0.00	36.45	36.45	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.94			0.00			10.81			0.00		
Approach LOS	A			A			B			A		
d_I, Intersection Delay [s/veh]	6.98											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	15.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.229

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	160	93	68	25	18	129
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	84	0	0	0	0	44
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	300	126	92	34	24	218
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	75	32	23	9	6	55
Total Analysis Volume [veh/h]	300	126	92	34	24	218
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.23	0.05	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	15.91	12.22	8.07	0.00
Movement LOS	A	A	C	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.88	0.88	0.76	0.76
95th-Percentile Queue Length [ft]	0.00	0.00	21.95	21.95	18.91	18.91
d_A, Approach Delay [s/veh]	0.00		14.92		0.80	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	2.61					
Intersection LOS	C					

APPENDIX T.1

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Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	138.8
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	280	155	170	243	307	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	36	74	39	5	10	23
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	414	283	269	333	424	267
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	104	71	67	83	106	67
Total Analysis Volume [veh/h]	414	283	269	333	424	267
Pedestrian Volume [ped/h]	147		0		0	

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	41.35	4.07	5.41	11.21	1.00	1.00
95th-Percentile Queue Length [ft]	1033.77	101.83	135.33	280.27	25.01	25.01
Approach Delay [s/veh]	334.37	25.05		40.50		
Approach LOS	F	D		E		
Intersection Delay [s/veh]	138.75					
Intersection LOS	F					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	611.7
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	2.093

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	103	4	254	0	0	0	114	236	0	0	282	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.00	1.00	1.00	1.35	1.35	1.00	1.00	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	36	0	10	0	0	0	18	23	0	0	41	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	175	5	353	0	0	0	172	342	0	0	422	325
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	44	1	88	0	0	0	43	86	0	0	106	81
Total Analysis Volume [veh/h]	175	5	353	0	0	0	172	342	0	0	422	325
Pedestrian Volume [ped/h]	146			0			0			0		

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Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	2.09	0.07	0.50	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	611.75	55.73	12.45	0.00	0.00	0.00	10.22	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	F	B				B	A			A	A
95th-Percentile Queue Length [veh]	15.62	1.34	1.18	0.00	0.00	0.00	0.74	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	390.58	33.54	29.44	0.00	0.00	0.00	18.55	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	209.62			0.00			3.42			0.00		
Approach LOS	F			A			A			A		
d_I, Intersection Delay [s/veh]	63.26											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	14.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	75	30	26	149	279	101	67	175	60	111	152	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	26	0	0	0	0	23	29	41	27	0	72	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	127	41	35	201	377	159	119	277	108	150	277	162
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	10	9	50	94	40	30	69	27	38	69	41
Total Analysis Volume [veh/h]	127	41	35	201	377	159	119	277	108	150	277	162
Pedestrian Volume [ped/h]	112			0			0			0		

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.16	2.06	1.69	1.69	1.16	0.98	3.26	0.72	1.34	3.27	1.21
95th-Percentile Queue Length [ft]	28.91	51.42	42.26	42.26	28.94	24.43	81.56	17.97	33.47	81.76	30.32
Approach Delay [s/veh]	9.95	13.85				15.27			15.30		
Approach LOS	A	B				C			C		
Intersection Delay [s/veh]	14.23										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset PM Future + All Projects

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	11	2.0	0.307	6.0	LOS A	1.7	41.9	0.42	0.28	22.8
8	T1	22	2.0	0.307	6.0	LOS A	1.7	41.9	0.42	0.28	22.8
18	R2	321	2.0	0.307	6.0	LOS A	1.7	41.9	0.42	0.28	22.6
Approach		354	2.0	0.307	6.0	LOS A	1.7	41.9	0.42	0.28	22.6
East: Sunset Ave											
1	L2	342	2.0	0.419	6.6	LOS A	2.9	73.6	0.20	0.07	22.4
6	T1	153	2.0	0.419	6.6	LOS A	2.9	73.6	0.20	0.07	22.4
16	R2	75	2.0	0.419	6.6	LOS A	2.9	73.6	0.20	0.07	22.2
Approach		570	2.0	0.419	6.6	LOS A	2.9	73.6	0.20	0.07	22.4
North: Jay Street											
7	L2	60	2.0	0.098	5.2	LOS A	0.4	10.2	0.54	0.45	22.7
4	T1	19	2.0	0.098	5.2	LOS A	0.4	10.2	0.54	0.45	22.7
14	R2	3	2.0	0.098	5.2	LOS A	0.4	10.2	0.54	0.45	22.4
Approach		82	2.0	0.098	5.2	LOS A	0.4	10.2	0.54	0.45	22.7
West: Sunset Ave											
5	L2	1	2.0	0.159	5.5	LOS A	0.7	17.7	0.52	0.43	23.1
2	T1	130	2.0	0.159	5.5	LOS A	0.7	17.7	0.52	0.43	23.1
12	R2	15	2.0	0.159	5.5	LOS A	0.7	17.7	0.52	0.43	22.8
Approach		146	2.0	0.159	5.5	LOS A	0.7	17.7	0.52	0.43	23.1
All Vehicles		1152	2.0	0.419	6.2	LOS A	2.9	73.6	0.33	0.21	22.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	98.1
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	13	354	113	100	322	6	5	16	12	109	20	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	25	29	20	21	0	0	0	0	37	0	20
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	503	182	155	456	8	7	22	16	184	27	187
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	126	46	39	114	2	2	6	4	46	7	47
Total Analysis Volume [veh/h]	18	503	182	155	456	8	7	22	16	184	27	187
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	27.02	20.28	0.36	2.09	2.13
95th-Percentile Queue Length [ft]	675.49	506.92	8.99	52.21	53.34
Approach Delay [s/veh]	145.59	103.16	12.67	16.12	
Approach LOS	F	F	B	C	
Intersection Delay [s/veh]	98.12				
Intersection LOS	F				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	11.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	3	37	41	3	56	36
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	43	0	0	64
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	50	98	4	76	113
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	13	25	1	19	28
Total Analysis Volume [veh/h]	4	50	98	4	76	113
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.05	0.00	0.00	0.05	0.00
d_M, Delay for Movement [s/veh]	11.25	9.01	0.00	0.00	7.55	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.19	0.19	0.00	0.00	0.43	0.43
95th-Percentile Queue Length [ft]	4.69	4.69	0.00	0.00	10.87	10.87
d_A, Approach Delay [s/veh]	9.18		0.00		3.03	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	3.10					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	43.1
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.545

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	18	340	315	69	68	11
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	41	43	38	23	16	27
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	65	502	463	116	108	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	126	116	29	27	11
Total Analysis Volume [veh/h]	65	502	463	116	108	42
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.01	0.00	0.00	0.55	0.08
d_M, Delay for Movement [s/veh]	8.87	0.00	0.00	0.00	43.06	12.01
Movement LOS	A	A	A	A	E	B
95th-Percentile Queue Length [veh]	3.72	3.72	0.00	0.00	2.87	0.24
95th-Percentile Queue Length [ft]	92.95	92.95	0.00	0.00	71.71	6.11
d_A, Approach Delay [s/veh]	1.02		0.00		34.37	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	4.42					
Intersection LOS	E					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	121.3
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name				K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name				K St			11th St			11th St		
Base Volume Input [veh/h]	96	283	37	54	233	7	21	104	84	52	121	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	76	0	5	60	0	0	0	0	0	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	130	458	50	78	375	9	28	140	113	70	163	70
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	115	13	20	94	2	7	35	28	18	41	18
Total Analysis Volume [veh/h]	130	458	50	78	375	9	28	140	113	70	163	70
Pedestrian Volume [ped/h]	17			18			5			12		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	31.81	14.46	4.88	5.75
95th-Percentile Queue Length [ft]	795.28	361.57	121.96	143.74
Approach Delay [s/veh]	231.98	83.95	28.06	31.79
Approach LOS	F	F	D	D
Intersection Delay [s/veh]	121.32			
Intersection LOS	F			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	11.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	0	0	2	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	69	66	39	34	1	1	34	9	63	39	78
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	17	17	10	9	0	0	9	2	16	10	20
Total Analysis Volume [veh/h]	5	69	66	39	34	1	1	34	9	63	39	78
Pedestrian Volume [ped/h]	4			3			3			7		

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Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.06	0.01	0.10	0.06	0.08
d_M, Delay for Movement [s/veh]	7.30	0.00	0.00	7.59	0.00	0.00	11.68	11.16	8.81	11.25	11.24	9.47
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.29	0.29	0.29	0.16	0.16	0.16	0.18	0.18	0.18	0.57	0.57	0.57
95th-Percentile Queue Length [ft]	7.34	7.34	7.34	4.09	4.09	4.09	4.55	4.55	4.55	14.19	14.19	14.19
d_A, Approach Delay [s/veh]	0.26			4.00			10.69			10.48		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	6.14											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.4
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.017

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	11	26	9	3	28	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	0	0	2	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	38	12	4	40	14
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	10	3	1	10	4
Total Analysis Volume [veh/h]	15	38	12	4	40	14
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.04	0.00	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	9.35	8.58	0.00	0.00	7.31	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.17	0.17	0.00	0.00	0.10	0.10
95th-Percentile Queue Length [ft]	4.19	4.19	0.00	0.00	2.62	2.62
d_A, Approach Delay [s/veh]	8.80		0.00		5.41	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.17					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 13: Foster Avenue/ Creekside Prj Driveway

Control Type:	Two-way stop	Delay (sec / veh):	9.5
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.051

Intersection Setup

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	0	0	0	40	38	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	43	2	3	0	0	64
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	43	2	3	54	51	64
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	1	1	14	13	16
Total Analysis Volume [veh/h]	43	2	3	54	51	64
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.48	8.92	7.45	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.17	0.17	0.12	0.12	0.00	0.00
95th-Percentile Queue Length [ft]	4.17	4.17	3.02	3.02	0.00	0.00
d_A, Approach Delay [s/veh]	9.46		0.39		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.06					
Intersection LOS	A					

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Intersection Level Of Service Report

Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	11.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.046

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	5	0	5	184	0	6	0	8	99	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.00	1.35	1.35	1.00	1.35	1.00	1.35	1.35	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	15	0	83	0	0	4	0	20	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	22	0	90	248	0	12	0	31	134	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	0	23	62	0	3	0	8	34	0	0	0
Total Analysis Volume [veh/h]	22	0	90	248	0	12	0	31	134	0	0	0
Pedestrian Volume [ped/h]	0			0			9			9		

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Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.00	0.12	0.00	0.00	0.00	0.00	0.05	0.13	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	11.05	0.00	10.18	0.00	0.00	0.00	0.00	11.10	9.16	0.00	0.00	0.00
Movement LOS	B		B	A		A		B	A			
95th-Percentile Queue Length [veh]	0.40	0.00	0.40	0.00	0.00	0.00	0.00	0.62	0.62	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	9.90	0.00	9.90	0.00	0.00	0.00	0.00	15.47	15.47	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	10.35			0.00			9.53			0.00		
Approach LOS	B			A			A			A		
d_I, Intersection Delay [s/veh]	5.09											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	15.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.254

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	87	27	89	19	8	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	20	0	0	0	0	83
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	137	36	120	26	11	327
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	34	9	30	7	3	82
Total Analysis Volume [veh/h]	137	36	120	26	11	327
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.25	0.03	0.01	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	15.04	11.45	7.55	0.00
Movement LOS	A	A	C	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	1.08	1.08	0.93	0.93
95th-Percentile Queue Length [ft]	0.00	0.00	26.90	26.90	23.16	23.16
d_A, Approach Delay [s/veh]	0.00		14.40		0.25	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	3.33					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	20.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	95	95	183	225	158	392
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	11	18	73	10	2	30
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	139	146	320	314	215	559
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	37	80	79	54	140
Total Analysis Volume [veh/h]	139	146	320	314	215	559
Pedestrian Volume [ped/h]	75		0		0	

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.87	5.25	4.16	2.43	2.89	2.89
95th-Percentile Queue Length [ft]	121.69	131.13	103.95	60.72	72.22	72.22
Approach Delay [s/veh]	27.57	23.54		16.30		
Approach LOS	D	C		C		
Intersection Delay [s/veh]	20.91					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	211.6
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	1.143

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	74	0	118	0	0	0	93	430	0	0	251	67
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.00	1.00	1.00	1.35	1.35	1.00	1.00	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	0	2	0	0	0	19	30	0	0	21	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	116	0	161	0	0	0	145	611	0	0	360	90
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	29	0	40	0	0	0	36	153	0	0	90	23
Total Analysis Volume [veh/h]	116	0	161	0	0	0	145	611	0	0	360	90
Pedestrian Volume [ped/h]	75			0			0			0		

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Intersection Settings

Priority Scheme	Stop		Stop		Free		Free	
Flared Lane								
Storage Area [veh]	0		0		0		0	
Two-Stage Gap Acceptance	No							
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	1.14	0.00	0.33	0.00	0.00	0.00	0.13	0.01	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	211.57	39.37	13.71	0.00	0.00	0.00	8.73	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	E	B				A	A			A	A
95th-Percentile Queue Length [veh]	7.57	0.58	0.58	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	189.14	14.45	14.45	0.00	0.00	0.00	11.22	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	96.56			0.00			1.67			0.00		
Approach LOS	F			A			A			A		
d_I, Intersection Delay [s/veh]	18.89											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	23.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	35	7	11	311	391	190	128	201	46	90	123	112
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	18	0	0	0	0	13	29	49	19	0	27	10
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	65	9	15	420	528	270	202	320	81	122	193	161
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	16	2	4	105	132	68	51	80	20	31	48	40
Total Analysis Volume [veh/h]	65	9	15	420	528	270	202	320	81	122	193	161
Pedestrian Volume [ped/h]	60			0			0			0		

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Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	0.49	9.69	3.01	3.01	2.65	2.57	5.78	0.61	1.29	2.39	1.60
95th-Percentile Queue Length [ft]	12.23	242.1	75.13	75.13	66.28	64.32	144.61	15.19	32.23	59.73	40.12
Approach Delay [s/veh]	9.64	26.77				23.85			16.71		
Approach LOS	A	D				C			C		
Intersection Delay [s/veh]	23.39										
Intersection LOS	C										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset AM Future + All Projects

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	35	2.0	0.332	6.8	LOS A	1.8	44.5	0.51	0.40	22.6
8	T1	2	2.0	0.332	6.8	LOS A	1.8	44.5	0.51	0.40	22.6
18	R2	311	2.0	0.332	6.8	LOS A	1.8	44.5	0.51	0.40	22.3
Approach		348	2.0	0.332	6.8	LOS A	1.8	44.5	0.51	0.40	22.4
East: Sunset Ave											
1	L2	299	2.0	0.390	6.3	LOS A	2.6	65.3	0.20	0.07	22.5
6	T1	216	2.0	0.390	6.3	LOS A	2.6	65.3	0.20	0.07	22.6
16	R2	13	2.0	0.390	6.3	LOS A	2.6	65.3	0.20	0.07	22.3
Approach		528	2.0	0.390	6.3	LOS A	2.6	65.3	0.20	0.07	22.5
North: Jay Street											
7	L2	56	2.0	0.089	5.4	LOS A	0.4	9.2	0.55	0.48	22.6
4	T1	15	2.0	0.089	5.4	LOS A	0.4	9.2	0.55	0.48	22.6
14	R2	1	2.0	0.089	5.4	LOS A	0.4	9.2	0.55	0.48	22.4
Approach		72	2.0	0.089	5.4	LOS A	0.4	9.2	0.55	0.48	22.6
West: Sunset Ave											
5	L2	1	2.0	0.253	6.2	LOS A	1.2	30.7	0.53	0.44	22.9
2	T1	230	2.0	0.253	6.2	LOS A	1.2	30.7	0.53	0.44	22.9
12	R2	14	2.0	0.253	6.2	LOS A	1.2	30.7	0.53	0.44	22.7
Approach		245	2.0	0.253	6.2	LOS A	1.2	30.7	0.53	0.44	22.9
All Vehicles		1193	2.0	0.390	6.4	LOS A	2.6	65.3	0.38	0.27	22.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	66.4
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd						Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd						Foster Ave		
Base Volume Input [veh/h]	11	201	101	120	251	43	36	26	16	159	31	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	16	4	17	13	15	5	11	9	32	18	4	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	275	153	175	354	63	60	44	54	233	46	101
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	69	38	44	89	16	15	11	14	58	12	25
Total Analysis Volume [veh/h]	31	275	153	175	354	63	60	44	54	233	46	101
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	10.31	21.74	1.71	3.39	1.34
95th-Percentile Queue Length [ft]	257.78	543.60	42.66	84.69	33.61
Approach Delay [s/veh]	45.55	126.36	16.54	19.02	
Approach LOS	E	F	C	C	
Intersection Delay [s/veh]	66.43				
Intersection LOS	F				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	11.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	1	83	3	3	122	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	112	4	4	165	4
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	28	1	1	41	1
Total Analysis Volume [veh/h]	1	112	4	4	165	4
Pedestrian Volume [ped/h]	9		0		0	

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Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.11	0.00	0.00	0.10	0.00
d_M, Delay for Movement [s/veh]	11.67	8.83	0.00	0.00	7.53	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.36	0.36	0.00	0.00	0.36	0.36
95th-Percentile Queue Length [ft]	9.04	9.04	0.00	0.00	8.92	8.92
d_A, Approach Delay [s/veh]	8.85		0.00		7.35	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.73					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	26.0
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.373

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	13	247	321	104	75	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	38	69	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	18	371	502	140	101	16
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	5	93	126	35	25	4
Total Analysis Volume [veh/h]	18	371	502	140	101	16
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.00	0.01	0.00	0.37	0.03
d_M, Delay for Movement [s/veh]	8.89	0.00	0.00	0.00	26.01	12.15
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh]	2.05	2.05	0.00	0.00	1.66	0.10
95th-Percentile Queue Length [ft]	51.19	51.19	0.00	0.00	41.42	2.38
d_A, Approach Delay [s/veh]	0.41		0.00		24.12	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	2.60					
Intersection LOS	D					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	32.9
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes		

Intersection Setup

Name	K St			K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	K St			K St			11th St			11th St		
Base Volume Input [veh/h]	109	143	16	37	182	6	38	153	112	32	73	27
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	35	0	6	63	0	0	0	0	0	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	147	228	22	56	309	8	51	207	151	43	99	39
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	57	6	14	77	2	13	52	38	11	25	10
Total Analysis Volume [veh/h]	147	228	22	56	309	8	51	207	151	43	99	39
Pedestrian Volume [ped/h]	9			9			6			6		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	8.01	6.95	8.18	2.02
95th-Percentile Queue Length [ft]	200.29	173.86	204.45	50.43
Approach Delay [s/veh]	36.80	32.38	36.59	17.10
Approach LOS	E	D	E	C
Intersection Delay [s/veh]	32.90			
Intersection LOS	D			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	13.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.011

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	2	56	54	63	61	2	4	23	6	52	18	45
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	3	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	77	73	85	85	3	5	31	8	70	24	61
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	19	18	21	21	1	1	8	2	18	6	15
Total Analysis Volume [veh/h]	3	77	73	85	85	3	5	31	8	70	24	61
Pedestrian Volume [ped/h]	5			5			4			4		

Intersection Settings

Priority Scheme	Free		Free		Stop		Stop	
Flared Lane					Yes		Yes	
Storage Area [veh]	0		0		1		1	
Two-Stage Gap Acceptance					No		No	
Number of Storage Spaces in Median	0		0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.06	0.00	0.00	0.01	0.06	0.01	0.14	0.05	0.07
d_M, Delay for Movement [s/veh]	7.41	0.00	0.00	7.69	0.00	0.00	13.39	12.90	9.27	13.29	13.09	9.93
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.34	0.34	0.34	0.41	0.41	0.41	0.24	0.24	0.24	0.69	0.69	0.69
95th-Percentile Queue Length [ft]	8.52	8.52	8.52	10.37	10.37	10.37	6.03	6.03	6.03	17.29	17.29	17.29
d_A, Approach Delay [s/veh]	0.15			3.78			12.29			11.93		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	5.84											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	10.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	4	53	5	3	75	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	73	7	4	104	7
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	18	2	1	26	2
Total Analysis Volume [veh/h]	5	73	7	4	104	7
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.07	0.00	0.00	0.06	0.00
d_M, Delay for Movement [s/veh]	10.32	8.64	0.00	0.00	7.39	0.00
Movement LOS	B	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.24	0.24	0.00	0.00	0.22	0.22
95th-Percentile Queue Length [ft]	6.07	6.07	0.00	0.00	5.55	5.55
d_A, Approach Delay [s/veh]	8.74		0.00		6.93	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.25					
Intersection LOS	B					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 13: Foster Ave/ Project Driveway

Control Type:	Two-way stop	Delay (sec / veh):	9.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.066

Intersection Setup

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	0	0	0	58	81	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	52	3	1	0	0	25
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	52	3	1	78	109	25
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	13	1	0	20	27	6
Total Analysis Volume [veh/h]	52	3	1	78	109	25
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.07	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.92	9.21	7.48	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.22	0.22	0.17	0.17	0.00	0.00
95th-Percentile Queue Length [ft]	5.57	5.57	4.32	4.32	0.00	0.00
d_A, Approach Delay [s/veh]	9.88		0.09		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.05					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 14: Foster Ave/Q St

Control Type:	Two-way stop	Delay (sec / veh):	10.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.006

Intersection Setup

Name	Q St		Foster Ave			
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Q St		Foster Ave			
Base Volume Input [veh/h]	3	0	54	3	3	74
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	52	0	0	25
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	0	125	4	4	125
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	31	1	1	31
Total Analysis Volume [veh/h]	4	0	125	4	4	125
Pedestrian Volume [ped/h]	0		0		0	

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.98	8.93	0.00	0.00	7.48	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.02	0.02	0.00	0.00	0.29	0.29
95th-Percentile Queue Length [ft]	0.42	0.42	0.00	0.00	7.27	7.27
d_A, Approach Delay [s/veh]	9.98		0.00		0.23	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.27					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 1: St Louis Rd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	11.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.132

Intersection Setup

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Approach	Northbound			Southbound			Westbound			Northwestbound		
Lane Configuration												
Turning Movement	Thru	Right	Right	Left	Left	Thru	Left2	Left	Right	Left	Right	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00			25.00			25.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	No			No			Yes			Yes		

volumes

Name	St Louis Rd			St Louis Rd			US 101 Overpass			US 101 Overpass		
Base Volume Input [veh/h]	22	0	21	138	0	10	0	8	156	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.00	1.35	1.35	1.00	1.35	1.00	1.35	1.35	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	8	0	44	0	0	15	0	84	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	38	0	72	186	0	29	0	95	211	0	0	0
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	10	0	18	47	0	7	0	24	53	0	0	0
Total Analysis Volume [veh/h]	38	0	72	186	0	29	0	95	211	0	0	0
Pedestrian Volume [ped/h]	0			0			11			11		

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Version 4.00-02

Intersection Settings

Priority Scheme	Stop	Free	Stop	Free
Flared Lane	Yes		No	
Storage Area [veh]	1	0	0	0
Two-Stage Gap Acceptance	No		No	
Number of Storage Spaces in Median	0	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.00	0.09	0.00	0.00	0.00	0.00	0.13	0.20	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	10.46	0.00	9.67	0.00	0.00	0.00	0.00	11.91	10.32	0.00	0.00	0.00
Movement LOS	B		A	A		A		B	B			
95th-Percentile Queue Length [veh]	0.29	0.00	0.29	0.00	0.00	0.00	0.00	1.46	1.46	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	7.21	0.00	7.21	0.00	0.00	0.00	0.00	36.45	36.45	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	9.94			0.00			10.81			0.00		
Approach LOS	A			A			B			A		
d_I, Intersection Delay [s/veh]	6.98											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 2: L.K. Wood Blvd/US 101 Overpass

Control Type:	Two-way stop	Delay (sec / veh):	15.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.229

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd			
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	25.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd			
Base Volume Input [veh/h]	160	93	68	25	18	129
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	84	0	0	0	0	44
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	300	126	92	34	24	218
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	75	32	23	9	6	55
Total Analysis Volume [veh/h]	300	126	92	34	24	218
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Stop		Free	
Flared Lane			Yes			
Storage Area [veh]	0		1		0	
Two-Stage Gap Acceptance			No			
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.23	0.05	0.02	0.00
d_M, Delay for Movement [s/veh]	0.00	0.00	15.91	12.22	8.07	0.00
Movement LOS	A	A	C	B	A	A
95th-Percentile Queue Length [veh]	0.00	0.00	0.88	0.88	0.76	0.76
95th-Percentile Queue Length [ft]	0.00	0.00	21.95	21.95	18.91	18.91
d_A, Approach Delay [s/veh]	0.00		14.92		0.80	
Approach LOS	A		B		A	
d_I, Intersection Delay [s/veh]	2.61					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 3: LK Wood Blvd/ Sunset Ave

Control Type:	All-way stop	Delay (sec / veh):	138.8
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	60.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	LK Wood Blvd		LK Wood Blvd		Sunset Ave	
Base Volume Input [veh/h]	280	155	170	243	307	181
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	36	74	39	5	10	23
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	414	283	269	333	424	267
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	104	71	67	83	106	67
Total Analysis Volume [veh/h]	414	283	269	333	424	267
Pedestrian Volume [ped/h]	147		0		0	

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	41.35	4.07	5.41	11.21	1.00	1.00
95th-Percentile Queue Length [ft]	1033.77	101.83	135.33	280.27	25.01	25.01
Approach Delay [s/veh]	334.37	25.05		40.50		
Approach LOS	F	D		E		
Intersection Delay [s/veh]	138.75					
Intersection LOS	F					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 4: Sunset Ave/US 101 NB Ramps

Control Type:	Two-way stop	Delay (sec / veh):	611.7
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes	Volume to Capacity (v/c):	2.093

Intersection Setup

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	320.00	100.00	320.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			25.00			25.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	US 101 NB On-Ramp			US 101 NB Off-Ramp			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	103	4	254	0	0	0	114	236	0	0	282	241
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.00	1.00	1.00	1.35	1.35	1.00	1.00	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	36	0	10	0	0	0	18	23	0	0	41	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	175	5	353	0	0	0	172	342	0	0	422	325
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	44	1	88	0	0	0	43	86	0	0	106	81
Total Analysis Volume [veh/h]	175	5	353	0	0	0	172	342	0	0	422	325
Pedestrian Volume [ped/h]	146			0			0			0		

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Intersection Settings

Priority Scheme	Stop			Stop			Free			Free		
Flared Lane												
Storage Area [veh]	0			0			0			0		
Two-Stage Gap Acceptance	No											
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	2.09	0.07	0.50	0.00	0.00	0.00	0.20	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	611.75	55.73	12.45	0.00	0.00	0.00	10.22	0.00	0.00	0.00	0.00	0.00
Movement LOS	F	F	B				B	A			A	A
95th-Percentile Queue Length [veh]	15.62	1.34	1.18	0.00	0.00	0.00	0.74	0.00	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	390.58	33.54	29.44	0.00	0.00	0.00	18.55	0.00	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	209.62			0.00			3.42			0.00		
Approach LOS	F			A			A			A		
d_I, Intersection Delay [s/veh]	63.26											
Intersection LOS	F											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 5: Sunset Ave/US 101 Ramps-G St-H St

Control Type:	All-way stop	Delay (sec / veh):	14.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	1	0	1	1	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	50.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			No			No			No		

volumes

Name	G St			US 101 Ramps			Sunset Ave			Sunset Ave		
Base Volume Input [veh/h]	75	30	26	149	279	101	67	175	60	111	152	116
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	26	0	0	0	0	23	29	41	27	0	72	5
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	127	41	35	201	377	159	119	277	108	150	277	162
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	32	10	9	50	94	40	30	69	27	38	69	41
Total Analysis Volume [veh/h]	127	41	35	201	377	159	119	277	108	150	277	162
Pedestrian Volume [ped/h]	112			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.16	2.06	1.69	1.69	1.16	0.98	3.26	0.72	1.34	3.27	1.21
95th-Percentile Queue Length [ft]	28.91	51.42	42.26	42.26	28.94	24.43	81.56	17.97	33.47	81.76	30.32
Approach Delay [s/veh]	9.95	13.85				15.27			15.30		
Approach LOS	A	B				C			C		
Intersection Delay [s/veh]	14.23										
Intersection LOS	B										

APPENDIX T.1

MOVEMENT SUMMARY

Site: Int 6- Foster-Jay/Sunset PM Future + All Projects

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Foster Ave											
3	L2	11	2.0	0.307	6.0	LOS A	1.7	41.9	0.42	0.28	22.8
8	T1	22	2.0	0.307	6.0	LOS A	1.7	41.9	0.42	0.28	22.8
18	R2	321	2.0	0.307	6.0	LOS A	1.7	41.9	0.42	0.28	22.6
Approach		354	2.0	0.307	6.0	LOS A	1.7	41.9	0.42	0.28	22.6
East: Sunset Ave											
1	L2	342	2.0	0.419	6.6	LOS A	2.9	73.6	0.20	0.07	22.4
6	T1	153	2.0	0.419	6.6	LOS A	2.9	73.6	0.20	0.07	22.4
16	R2	75	2.0	0.419	6.6	LOS A	2.9	73.6	0.20	0.07	22.2
Approach		570	2.0	0.419	6.6	LOS A	2.9	73.6	0.20	0.07	22.4
North: Jay Street											
7	L2	60	2.0	0.098	5.2	LOS A	0.4	10.2	0.54	0.45	22.7
4	T1	19	2.0	0.098	5.2	LOS A	0.4	10.2	0.54	0.45	22.7
14	R2	3	2.0	0.098	5.2	LOS A	0.4	10.2	0.54	0.45	22.4
Approach		82	2.0	0.098	5.2	LOS A	0.4	10.2	0.54	0.45	22.7
West: Sunset Ave											
5	L2	1	2.0	0.159	5.5	LOS A	0.7	17.7	0.52	0.43	23.1
2	T1	130	2.0	0.159	5.5	LOS A	0.7	17.7	0.52	0.43	23.1
12	R2	15	2.0	0.159	5.5	LOS A	0.7	17.7	0.52	0.43	22.8
Approach		146	2.0	0.159	5.5	LOS A	0.7	17.7	0.52	0.43	23.1
All Vehicles		1152	2.0	0.419	6.2	LOS A	2.9	73.6	0.33	0.21	22.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	125.5
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	20	329	105	100	303	25	30	24	18	102	27	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	41	15	23	20	8	13	10	6	27	27	10	20
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	68	459	165	155	417	47	51	38	51	165	46	187
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	115	41	39	104	12	13	10	13	41	12	47
Total Analysis Volume [veh/h]	68	459	165	155	417	47	51	38	51	165	46	187
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	30.97	24.20	1.48	1.92	2.76
95th-Percentile Queue Length [ft]	774.32	604.99	36.98	47.88	69.09
Approach Delay [s/veh]	192.63	144.50	16.16	17.77	
Approach LOS	F	F	C	C	
Intersection Delay [s/veh]	125.52				
Intersection LOS	F				

APPENDIX T.1

Intersection Level Of Service Report
Intersection 8: Q St/Q St-17th St

Control Type:	Two-way stop	Delay (sec / veh):	9.7
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.005

Intersection Setup

Name	Q St		Q St		17th St	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		No		No	

volumes

Name	Q St		Q St		17th St	
Base Volume Input [veh/h]	3	37	3	3	56	2
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	50	4	4	76	3
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	13	1	1	19	1
Total Analysis Volume [veh/h]	4	50	4	4	76	3
Pedestrian Volume [ped/h]	0		0		0	

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Intersection Settings

Priority Scheme	Stop	Free	Free
Flared Lane	No		
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance	No		
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.05	0.00	0.00	0.05	0.00
d_M, Delay for Movement [s/veh]	9.74	8.53	0.00	0.00	7.34	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.16	0.16	0.00	0.00	0.15	0.15
95th-Percentile Queue Length [ft]	4.07	4.07	0.00	0.00	3.86	3.86
d_A, Approach Delay [s/veh]	8.62		0.00		7.06	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.26					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 9: Alliance Rd/17th St

Control Type:	Two-way stop	Delay (sec / veh):	24.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.202

Intersection Setup

Name	Alliance Rd		Alliance Rd		17th St	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	20.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		Yes	

volumes

Name	Alliance Rd		Alliance Rd		17th St	
Base Volume Input [veh/h]	11	340	315	42	35	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	84	65	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	543	490	57	47	7
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	136	123	14	12	2
Total Analysis Volume [veh/h]	15	543	490	57	47	7
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free		Free		Stop	
Flared Lane						
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance					No	
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.00	0.00	0.20	0.01
d_M, Delay for Movement [s/veh]	8.57	0.00	0.00	0.00	24.37	11.54
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	3.41	3.41	0.00	0.00	0.74	0.04
95th-Percentile Queue Length [ft]	85.13	85.13	0.00	0.00	18.42	0.95
d_A, Approach Delay [s/veh]	0.23		0.00		22.70	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	1.17					
Intersection LOS	C					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 10: K St/11th St

Control Type:	All-way stop	Delay (sec / veh):	121.3
Analysis Method:	HCM 2010	Level Of Service:	F
Analysis Period:	15 minutes		

Intersection Setup

Name				K St			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name				K St			11th St			11th St		
Base Volume Input [veh/h]	96	283	37	54	233	7	21	104	84	52	121	46
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	76	0	5	60	0	0	0	0	0	0	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	130	458	50	78	375	9	28	140	113	70	163	70
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	115	13	20	94	2	7	35	28	18	41	18
Total Analysis Volume [veh/h]	130	458	50	78	375	9	28	140	113	70	163	70
Pedestrian Volume [ped/h]	17			18			5			12		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	31.81	14.46	4.88	5.75
95th-Percentile Queue Length [ft]	795.28	361.57	121.96	143.74
Approach Delay [s/veh]	231.98	83.95	28.06	31.79
Approach LOS	F	F	D	D
Intersection Delay [s/veh]	121.32			
Intersection LOS	F			

APPENDIX T.1

Intersection Level Of Service Report
Intersection 11: 11th St/Janes Rd

Control Type:	Two-way stop	Delay (sec / veh):	11.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.002

Intersection Setup

Name	11th St			Janes Rd			11th St			11th St		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	11th St			Janes Rd			11th St			11th St		
Base Volume Input [veh/h]	4	49	49	29	24	1	1	25	7	47	29	58
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	0	0	2	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	69	66	39	34	1	1	34	9	63	39	78
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	17	17	10	9	0	0	9	2	16	10	20
Total Analysis Volume [veh/h]	5	69	66	39	34	1	1	34	9	63	39	78
Pedestrian Volume [ped/h]	4			3			3			7		

Intersection Settings

Priority Scheme	Free			Free			Stop			Stop		
Flared Lane							Yes			Yes		
Storage Area [veh]	0			0			1			1		
Two-Stage Gap Acceptance							No			No		
Number of Storage Spaces in Median	0			0			0			0		

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.06	0.01	0.10	0.06	0.08
d_M, Delay for Movement [s/veh]	7.30	0.00	0.00	7.59	0.00	0.00	11.68	11.16	8.81	11.25	11.24	9.47
Movement LOS	A	A	A	A	A	A	B	B	A	B	B	A
95th-Percentile Queue Length [veh]	0.29	0.29	0.29	0.16	0.16	0.16	0.18	0.18	0.18	0.57	0.57	0.57
95th-Percentile Queue Length [ft]	7.34	7.34	7.34	4.09	4.09	4.09	4.55	4.55	4.55	14.19	14.19	14.19
d_A, Approach Delay [s/veh]	0.26			4.00			10.69			10.48		
Approach LOS	A			A			B			B		
d_I, Intersection Delay [s/veh]	6.14											
Intersection LOS	B											

APPENDIX T.1

Intersection Level Of Service Report
Intersection 12: Janes Rd/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.4
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.017

Intersection Setup

Name	Foster Ave		Janes Rd		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

volumes

Name	Foster Ave		Janes Rd		Foster Ave	
Base Volume Input [veh/h]	11	26	9	3	28	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	0	0	2	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	15	38	12	4	40	14
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	10	3	1	10	4
Total Analysis Volume [veh/h]	15	38	12	4	40	14
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.02	0.04	0.00	0.00	0.02	0.00
d_M, Delay for Movement [s/veh]	9.35	8.58	0.00	0.00	7.31	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.17	0.17	0.00	0.00	0.10	0.10
95th-Percentile Queue Length [ft]	4.19	4.19	0.00	0.00	2.62	2.62
d_A, Approach Delay [s/veh]	8.80		0.00		5.41	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	6.17					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 13: Foster Avenue/ Creekside Prj Driveway

Control Type:	Two-way stop	Delay (sec / veh):	9.5
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.051

Intersection Setup

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Approach	Southbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Creekside Prj DW		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	0	0	0	40	38	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	43	2	3	0	0	64
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	43	2	3	54	51	64
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	11	1	1	14	13	16
Total Analysis Volume [veh/h]	43	2	3	54	51	64
Pedestrian Volume [ped/h]	0		0		0	

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.05	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.48	8.92	7.45	0.00	0.00	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.17	0.17	0.12	0.12	0.00	0.00
95th-Percentile Queue Length [ft]	4.17	4.17	3.02	3.02	0.00	0.00
d_A, Approach Delay [s/veh]	9.46		0.39		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	2.06					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 14: Q St/Foster Ave

Control Type:	Two-way stop	Delay (sec / veh):	9.6
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.004

Intersection Setup

Name	Q St		Foster Ave		Foster Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		25.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

volumes

Name	Q St		Foster Ave		Foster Ave	
Base Volume Input [veh/h]	2	0	38	3	1	33
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.35	1.35	1.35	1.35	1.35	1.35
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	43	0	0	64
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	0	94	4	1	109
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	0	24	1	0	27
Total Analysis Volume [veh/h]	3	0	94	4	1	109
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Stop		Free		Free	
Flared Lane	No					
Storage Area [veh]	0		0		0	
Two-Stage Gap Acceptance	No					
Number of Storage Spaces in Median	0		0		0	

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.00	0.00	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.63	8.77	0.00	0.00	7.41	0.00
Movement LOS	A	A	A	A	A	A
95th-Percentile Queue Length [veh]	0.01	0.01	0.00	0.00	0.24	0.24
95th-Percentile Queue Length [ft]	0.29	0.29	0.00	0.00	5.95	5.95
d_A, Approach Delay [s/veh]	9.63		0.00		0.07	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	0.17					
Intersection LOS	A					

APPENDIX T.1

Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	17.7
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	75.00	50.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	13	354	113	100	322	6	5	16	12	109	20	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	0	0	8	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	369	113	100	330	6	5	16	12	109	20	124
Peak Hour Factor	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	100	31	27	90	2	1	4	3	30	5	34
Total Analysis Volume [veh/h]	14	402	123	109	359	7	5	17	13	119	22	135
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	6.12	0.70	0.77	4.59	0.23	0.99	1.17
95th-Percentile Queue Length [ft]	152.99	17.48	19.34	114.70	5.86	24.85	29.27
Approach Delay [s/veh]	20.77		17.82		11.08	12.31	
Approach LOS	C		C		B	B	
Intersection Delay [s/veh]	17.69						
Intersection LOS	C						

APPENDIX T.1

Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	13.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	75.00	50.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	3	232	116	120	290	3	5	11	8	185	5	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	1	1	0	0	0	0	0	5	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	232	117	121	290	3	5	11	8	190	5	68
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	64	33	34	81	1	1	3	2	53	1	19
Total Analysis Volume [veh/h]	3	258	130	134	322	3	6	12	9	211	6	76
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.37	0.75	0.97	3.41	0.17	2.09	0.48
95th-Percentile Queue Length [ft]	59.35	18.72	24.33	85.13	4.21	52.17	11.97
Approach Delay [s/veh]	12.68		14.93		10.51	13.64	
Approach LOS	B		B		B	B	
Intersection Delay [s/veh]	13.75						
Intersection LOS	B						

APPENDIX T.1

Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	16.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	75.00	50.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	13	354	113	100	322	6	5	16	12	109	20	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	6	4	0	0	0	0	0	3	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	354	119	104	322	6	5	16	12	112	20	126
Peak Hour Factor	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	96	32	28	88	2	1	4	3	31	5	34
Total Analysis Volume [veh/h]	14	386	130	113	351	7	5	17	13	122	22	137
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	5.58	0.75	0.81	4.37	0.23	1.02	1.18
95th-Percentile Queue Length [ft]	139.54	18.74	20.22	109.25	5.83	25.51	29.55
Approach Delay [s/veh]	19.35		17.30		11.02	12.31	
Approach LOS	C		C		B	B	
Intersection Delay [s/veh]	16.89						
Intersection LOS	C						

APPENDIX T.1

Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	13.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	75.00	50.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	3	232	116	120	290	3	5	11	8	185	5	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	2	2	0	0	0	0	0	9	0	6
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	232	118	122	290	3	5	11	8	194	5	71
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	64	33	34	81	1	1	3	2	54	1	20
Total Analysis Volume [veh/h]	3	258	131	136	322	3	6	12	9	216	6	79
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.40	0.76	1.00	3.44	0.17	2.17	0.50
95th-Percentile Queue Length [ft]	59.91	19.05	24.96	86.00	4.23	54.35	12.51
Approach Delay [s/veh]	12.78		15.06		10.55	13.83	
Approach LOS	B		C		B	B	
Intersection Delay [s/veh]	13.89						
Intersection LOS	B						

APPENDIX T.1

Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	17.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	75.00	50.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	13	354	113	100	322	6	5	16	12	109	20	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	9	6	0	0	0	0	0	5	0	3
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	354	122	106	322	6	5	16	12	114	20	127
Peak Hour Factor	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	96	33	29	88	2	1	4	3	31	5	35
Total Analysis Volume [veh/h]	14	386	133	115	351	7	5	17	13	124	22	138
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	5.62	0.77	0.83	4.40	0.23	1.04	1.20
95th-Percentile Queue Length [ft]	140.38	19.35	20.74	109.89	5.84	26.12	29.88
Approach Delay [s/veh]	19.43		17.38		11.05	12.37	
Approach LOS	C		C		B	B	
Intersection Delay [s/veh]	16.96						
Intersection LOS	C						

APPENDIX T.1

Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	13.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	75.00	50.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	3	232	116	120	290	3	5	11	8	185	5	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	14	9	0	0	0	0	0	4	0	2
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	232	130	129	290	3	5	11	8	189	5	67
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	64	36	36	81	1	1	3	2	53	1	19
Total Analysis Volume [veh/h]	3	258	144	143	322	3	6	12	9	210	6	74
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.38	0.85	1.06	3.42	0.17	2.09	0.47
95th-Percentile Queue Length [ft]	59.54	21.33	26.58	85.53	4.24	52.23	11.73
Approach Delay [s/veh]	12.68		14.99		10.55	13.73	
Approach LOS	B		B		B	B	
Intersection Delay [s/veh]	13.79						
Intersection LOS	B						

APPENDIX T.1

Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	17.6
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	75.00	50.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	13	354	113	100	322	6	5	16	12	109	20	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	8	5	0	0	0	0	0	19	0	12
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	354	121	105	322	6	5	16	12	128	20	136
Peak Hour Factor	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	96	33	29	88	2	1	4	3	35	5	37
Total Analysis Volume [veh/h]	14	386	132	114	351	7	5	17	13	139	22	148
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	5.86	0.79	0.84	4.57	0.24	1.23	1.31
95th-Percentile Queue Length [ft]	146.38	19.67	20.97	114.32	5.95	30.71	32.79
Approach Delay [s/veh]	20.35		18.07		11.19	12.82	
Approach LOS	C		C		B	B	
Intersection Delay [s/veh]	17.59						
Intersection LOS	C						

APPENDIX T.1

Generated with PTV VISTRO

Version 4.00-02

Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	14.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	75.00	50.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	3	232	116	120	290	3	5	11	8	185	5	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	11	9	0	5	0	0	0	0	4	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	243	125	120	295	3	5	11	8	189	5	65
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	68	35	33	82	1	1	3	2	53	1	18
Total Analysis Volume [veh/h]	3	270	139	133	328	3	6	12	9	210	6	72
Pedestrian Volume [ped/h]	14			7			15			10		

Generated with PTV VISTRO

Version 4.00-02

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.57	0.81	0.97	3.55	0.17	2.10	0.46
95th-Percentile Queue Length [ft]	64.18	20.36	24.20	88.87	4.25	52.38	11.42
Approach Delay [s/veh]	13.00		15.26		10.57	13.78	
Approach LOS	B		C		B	B	
Intersection Delay [s/veh]	14.02						
Intersection LOS	B						

APPENDIX T.1

Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	18.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	75.00	50.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	13	354	113	100	322	6	5	16	12	109	20	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	10	6	0	13	0	0	0	0	10	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	364	119	100	335	6	5	16	12	119	20	124
Peak Hour Factor	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	99	32	27	91	2	1	4	3	32	5	34
Total Analysis Volume [veh/h]	14	397	130	109	365	7	5	17	13	130	22	135
Pedestrian Volume [ped/h]	24			18			18			10		

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	6.11	0.76	0.78	4.88	0.24	1.13	1.18
95th-Percentile Queue Length [ft]	152.83	19.04	19.60	121.88	5.94	28.17	29.58
Approach Delay [s/veh]	20.86		18.65		11.18	12.58	
Approach LOS	C		C		B	B	
Intersection Delay [s/veh]	18.05						
Intersection LOS	C						

APPENDIX T.1

Central Arcata Areawide Study W-Trans
Scenario 30: 30: PM Existing+ Foster Annexation (w/ Mitigation)

Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	15.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd						Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	1	0	0
Pocket Length [ft]	75.00	100.00	100.00	50.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd						Foster Ave		
Base Volume Input [veh/h]	11	201	101	120	251	43	36	26	16	159	31	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	21	0	0	0	2	3	11	9	32	3	1	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	201	101	120	253	46	47	35	48	162	32	65
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	56	28	33	70	13	13	10	13	45	9	18
Total Analysis Volume [veh/h]	36	223	112	133	281	51	52	39	53	180	36	72
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.75	0.70	1.06	4.03	1.20	1.79	0.75
95th-Percentile Queue Length [ft]	68.75	17.53	26.57	100.83	29.92	44.83	18.73
Approach Delay [s/veh]	14.50		17.10		13.22	13.66	
Approach LOS	B		C		B	B	
Intersection Delay [s/veh]	15.11						
Intersection LOS	C						

APPENDIX T.1

Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	22.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	75.00	50.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	20	329	105	100	303	25	30	24	18	102	27	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	41	0	0	0	0	13	10	6	27	0	10	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	61	329	105	100	303	38	40	30	45	102	37	124
Peak Hour Factor	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	90	29	27	83	10	11	8	12	28	10	34
Total Analysis Volume [veh/h]	66	358	114	109	330	41	44	33	49	111	40	135
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	8.13	0.72	0.86	5.69	1.11	1.00	1.55
95th-Percentile Queue Length [ft]	203.23	18.07	21.62	142.32	27.81	24.90	38.71
Approach Delay [s/veh]	29.32		22.06		13.85	13.68	
Approach LOS	D		C		B	B	
Intersection Delay [s/veh]	22.39						
Intersection LOS	C						

APPENDIX T.1

Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	15.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	75.00	50.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	3	232	116	120	290	3	5	11	8	185	5	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	15	26	13	20	0	0	0	0	22	0	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	3	247	142	133	310	3	5	11	8	207	5	78
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	69	39	37	86	1	1	3	2	58	1	22
Total Analysis Volume [veh/h]	3	274	158	148	344	3	6	12	9	230	6	87
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.78	1.01	1.16	4.15	0.18	2.52	0.58
95th-Percentile Queue Length [ft]	69.60	25.14	28.92	103.82	4.40	62.96	14.39
Approach Delay [s/veh]	13.70		16.80		10.84	14.83	
Approach LOS	B		C		B	B	
Intersection Delay [s/veh]	15.12						
Intersection LOS	C						

APPENDIX T.1

Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	20.8
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	75.00	50.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	13	354	113	100	322	6	5	16	12	109	20	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	25	29	20	21	0	0	0	0	37	0	20
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	13	379	142	120	343	6	5	16	12	146	20	144
Peak Hour Factor	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	103	39	33	93	2	1	4	3	40	5	39
Total Analysis Volume [veh/h]	14	413	155	131	374	7	5	17	13	159	22	157
Pedestrian Volume [ped/h]	24			18			18			10		

Generated with PTV VISTRO
Version 4.00-02

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	7.46	1.02	1.05	5.69	0.25	1.55	1.48
95th-Percentile Queue Length [ft]	186.60	25.40	26.20	142.37	6.24	38.74	37.04
Approach Delay [s/veh]	25.02		21.22		11.60	13.82	
Approach LOS	D		C		B	B	
Intersection Delay [s/veh]	20.79						
Intersection LOS	C						

APPENDIX T.1

Central Arcata Areawide Study W-Trans
Scenario 27: 27: PM Existing+ All Projects (w/ Mitigation)

Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	16.5
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd						Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	75.00	50.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd						Foster Ave		
Base Volume Input [veh/h]	11	201	101	120	251	43	36	26	16	159	31	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	21	4	17	13	17	3	11	9	32	21	1	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	205	118	133	268	46	47	35	48	180	32	78
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	57	33	37	74	13	13	10	13	50	9	22
Total Analysis Volume [veh/h]	36	228	131	148	298	51	52	39	53	200	36	87
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.02	0.89	1.28	4.80	1.26	2.20	0.91
95th-Percentile Queue Length [ft]	75.50	22.34	31.97	120.06	31.41	54.97	22.73
Approach Delay [s/veh]	15.38		19.26		13.75	14.78	
Approach LOS	C		C		B	B	
Intersection Delay [s/veh]	16.48						
Intersection LOS	C						

APPENDIX T.1

Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	15.5
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd						Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	75.00	50.00	100.00	100.00	50.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd						Foster Ave		
Base Volume Input [veh/h]	11	201	101	120	251	43	36	26	16	159	31	65
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	21	4	17	13	17	3	11	9	32	21	1	13
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	32	205	118	133	268	46	47	35	48	180	32	78
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	9	57	33	37	74	13	13	10	13	50	9	22
Total Analysis Volume [veh/h]	36	228	131	148	298	51	52	39	53	200	36	87
Pedestrian Volume [ped/h]	14			7			15			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.85	0.85	1.23	4.49	0.39	0.67	2.11	0.88
95th-Percentile Queue Length [ft]	71.18	21.36	30.64	112.25	9.83	16.63	52.84	21.95
Approach Delay [s/veh]	14.61		18.03		11.61		14.29	
Approach LOS	B		C		B		B	
Intersection Delay [s/veh]	15.47							
Intersection LOS	C							

APPENDIX T.1

Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	26.9
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	0	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	75.00	50.00	100.00	100.00	100.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	20	329	105	100	303	25	30	24	18	102	27	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	41	15	23	20	8	13	10	6	27	27	10	20
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	61	344	128	120	311	38	40	30	45	129	37	144
Peak Hour Factor	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	94	35	33	85	10	11	8	12	35	10	39
Total Analysis Volume [veh/h]	66	375	139	131	339	41	44	33	49	141	40	157
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	10.05	0.99	1.17	6.72	1.19	1.43	1.94
95th-Percentile Queue Length [ft]	251.22	24.77	29.16	168.12	29.66	35.86	48.51
Approach Delay [s/veh]	37.50		25.80		14.61	15.18	
Approach LOS	E		D		B	C	
Intersection Delay [s/veh]	26.95						
Intersection LOS	D						

APPENDIX T.1

Intersection Level Of Service Report
Intersection 7: Alliance Rd/Foster Ave

Control Type:	All-way stop	Delay (sec / veh):	24.2
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	75.00	50.00	100.00	100.00	50.00	100.00	100.00	70.00	100.00	100.00
Speed [mph]	30.00			25.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

volumes

Name	Alliance Ave			Alliance Rd			Foster Ave			Foster Ave		
Base Volume Input [veh/h]	20	329	105	100	303	25	30	24	18	102	27	124
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	41	15	23	20	8	13	10	6	27	27	10	20
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	61	344	128	120	311	38	40	30	45	129	37	144
Peak Hour Factor	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180	0.9180
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	17	94	35	33	85	10	11	8	12	35	10	39
Total Analysis Volume [veh/h]	66	375	139	131	339	41	44	33	49	141	40	157
Pedestrian Volume [ped/h]	24			18			18			10		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	9.26	0.94	1.12	6.23	0.36	0.64	1.38	1.86
95th-Percentile Queue Length [ft]	231.50	23.62	27.91	155.72	8.90	16.03	34.60	46.46
Approach Delay [s/veh]	33.04		23.55		12.30		14.65	
Approach LOS	D		C		B		B	
Intersection Delay [s/veh]	24.24							
Intersection LOS	C							

APPENDIX T.1

MOVEMENT SUMMARY

Site: Intersection 3-4 AM Future

5-Leg Roundabout with northbound right-turn slip lane

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: NB LK Wood Blvd											
3ax	L1	101	2.0	0.284	7.0	LOS A	1.4	34.4	0.58	0.52	32.3
8x	T1	27	2.0	0.284	7.0	LOS A	1.4	34.4	0.58	0.52	32.7
18x	R2	128	2.0	0.284	7.0	LOS A	1.4	34.4	0.58	0.52	31.9
Approach		256	2.0	0.284	7.0	LOS A	1.4	34.4	0.58	0.52	32.2
NorthEast: SB LK Wood Blvd											
1x	L2	247	2.0	0.558	11.0	LOS B	4.1	104.0	0.70	0.65	30.6
16ax	R1	240	2.0	0.558	11.0	LOS B	4.1	104.0	0.70	0.65	30.5
16x	R2	63	2.0	0.558	11.0	LOS B	4.1	104.0	0.70	0.65	30.0
Approach		550	2.0	0.558	11.0	LOS B	4.1	104.0	0.70	0.65	30.5
West: EB Sunset Ave											
5b	L3	124	2.0	0.641	12.1	LOS B	5.8	146.6	0.70	0.59	30.5
5a	L1	168	2.0	0.641	12.1	LOS B	5.8	146.6	0.70	0.59	30.0
12a	R1	411	2.0	0.641	12.1	LOS B	5.8	146.6	0.70	0.59	30.1
Approach		703	2.0	0.641	12.1	LOS B	5.8	146.6	0.70	0.59	30.2
SouthWest: NB US 101 Off											
5bx	L3	100	2.0	0.274	10.6	LOS B	1.1	28.0	0.71	0.71	30.3
5x	L2	1	2.0	0.274	10.6	LOS B	1.1	28.0	0.71	0.71	30.0
2x	T1	46	2.0	0.274	10.6	LOS B	1.1	28.0	0.71	0.71	30.1
12x	R2	113	2.0	0.157	6.7	LOS A	0.6	16.3	0.61	0.59	32.8
Approach		260	2.0	0.274	8.9	LOS A	1.1	28.0	0.67	0.66	31.2
All Vehicles		1769	2.0	0.641	10.6	LOS B	5.8	146.6	0.68	0.61	30.7

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Alliance Rd/Foster Ave - AM Future

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Alliance Rd											
3	L2	4	2.0	0.406	7.2	LOS A	2.5	62.7	0.46	0.31	22.6
8	T1	313	2.0	0.406	7.2	LOS A	2.5	62.7	0.46	0.31	22.7
18	R2	157	2.0	0.406	7.2	LOS A	2.5	62.7	0.46	0.31	22.4
Approach		474	2.0	0.406	7.2	LOS A	2.5	62.7	0.46	0.31	22.6
East: Foster Ave											
1	L2	250	2.0	0.341	7.1	LOS A	1.8	45.4	0.54	0.45	22.2
6	T1	7	2.0	0.341	7.1	LOS A	1.8	45.4	0.54	0.45	22.2
16	R2	88	2.0	0.341	7.1	LOS A	1.8	45.4	0.54	0.45	22.0
Approach		345	2.0	0.341	7.1	LOS A	1.8	45.4	0.54	0.45	22.2
North: Alliance Rd											
7	L2	162	2.0	0.548	10.5	LOS B	3.5	89.4	0.61	0.49	21.8
4	T1	392	2.0	0.548	10.5	LOS B	3.5	89.4	0.61	0.49	21.8
14	R2	4	2.0	0.548	10.5	LOS B	3.5	89.4	0.61	0.49	21.6
Approach		558	2.0	0.548	10.5	LOS B	3.5	89.4	0.61	0.49	21.8
West: Foster Ave											
5	L2	7	2.0	0.053	6.4	LOS A	0.2	5.1	0.62	0.57	22.7
2	T1	15	2.0	0.053	6.4	LOS A	0.2	5.1	0.62	0.57	22.7
12	R2	11	2.0	0.053	6.4	LOS A	0.2	5.1	0.62	0.57	22.4
Approach		33	2.0	0.053	6.4	LOS A	0.2	5.1	0.62	0.57	22.6
All Vehicles		1410	2.0	0.548	8.4	LOS A	3.5	89.4	0.54	0.42	22.2

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Intersection 3-4 PM Future

5-Leg Roundabout with northbound right-turn slip lane

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: NB LK Wood Blvd											
3ax	L1	203	2.0	0.854	32.3	LOS D	10.0	253.0	0.97	1.31	23.7
8x	T1	171	2.0	0.854	32.3	LOS D	10.0	253.0	0.97	1.31	23.9
18x	R2	209	2.0	0.854	32.3	LOS D	10.0	253.0	0.97	1.31	23.5
Approach		583	2.0	0.854	32.3	LOS D	10.0	253.0	0.97	1.31	23.7
NorthEast: SB LK Wood Blvd											
1x	L2	230	2.0	0.781	24.5	LOS C	7.7	194.7	0.92	1.15	25.9
16ax	R1	177	2.0	0.781	24.5	LOS C	7.7	194.7	0.92	1.15	25.8
16x	R2	151	2.0	0.781	24.5	LOS C	7.7	194.7	0.92	1.15	25.5
Approach		558	2.0	0.781	24.5	LOS C	7.7	194.7	0.92	1.15	25.8
West: EB Sunset Ave											
5b	L3	154	2.0	0.423	7.7	LOS A	2.6	64.9	0.52	0.38	31.7
5a	L1	201	2.0	0.423	7.7	LOS A	2.6	64.9	0.52	0.38	31.2
12a	R1	117	2.0	0.423	7.7	LOS A	2.6	64.9	0.52	0.38	31.3
Approach		473	2.0	0.423	7.7	LOS A	2.6	64.9	0.52	0.38	31.4
SouthWest: NB US 101 Off											
5bx	L3	139	2.0	0.517	13.2	LOS B	3.1	78.0	0.77	0.84	29.8
5x	L2	1	2.0	0.517	13.2	LOS B	3.1	78.0	0.77	0.84	29.6
2x	T1	216	2.0	0.517	13.2	LOS B	3.1	78.0	0.77	0.84	29.7
12x	R2	127	2.0	0.128	4.8	LOS A	0.6	14.2	0.47	0.36	33.7
Approach		483	2.0	0.517	11.0	LOS B	3.1	78.0	0.69	0.71	30.7
All Vehicles		2097	2.0	0.854	19.8	LOS C	10.0	253.0	0.79	0.92	27.2

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Alliance Rd/Foster Ave - PM Future

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Alliance Rd											
3	L2	18	2.0	0.545	9.3	LOS A	4.1	103.1	0.53	0.35	22.1
8	T1	478	2.0	0.545	9.3	LOS A	4.1	103.1	0.53	0.35	22.2
18	R2	153	2.0	0.545	9.3	LOS A	4.1	103.1	0.53	0.35	21.9
Approach		649	2.0	0.545	9.3	LOS A	4.1	103.1	0.53	0.35	22.1
East: Foster Ave											
1	L2	147	2.0	0.404	9.1	LOS A	2.1	54.1	0.66	0.66	21.9
6	T1	27	2.0	0.404	9.1	LOS A	2.1	54.1	0.66	0.66	21.9
16	R2	167	2.0	0.404	9.1	LOS A	2.1	54.1	0.66	0.66	21.7
Approach		341	2.0	0.404	9.1	LOS A	2.1	54.1	0.66	0.66	21.8
North: Alliance Rd											
7	L2	135	2.0	0.499	8.7	LOS A	3.4	86.3	0.53	0.37	22.2
4	T1	435	2.0	0.499	8.7	LOS A	3.4	86.3	0.53	0.37	22.2
14	R2	8	2.0	0.499	8.7	LOS A	3.4	86.3	0.53	0.37	22.0
Approach		578	2.0	0.499	8.7	LOS A	3.4	86.3	0.53	0.37	22.2
West: Foster Ave											
5	L2	7	2.0	0.066	6.0	LOS A	0.3	6.5	0.60	0.55	22.8
2	T1	22	2.0	0.066	6.0	LOS A	0.3	6.5	0.60	0.55	22.8
12	R2	16	2.0	0.066	6.0	LOS A	0.3	6.5	0.60	0.55	22.6
Approach		45	2.0	0.066	6.0	LOS A	0.3	6.5	0.60	0.55	22.7
All Vehicles		1613	2.0	0.545	9.0	LOS A	4.1	103.1	0.56	0.43	22.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Intersection 3-4 AM Future + The Village

5-Leg Roundabout with northbound right-turn slip lane

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: NB LK Wood Blvd											
3ax	L1	101	2.0	0.304	7.3	LOS A	1.5	37.4	0.59	0.53	32.2
8x	T1	27	2.0	0.304	7.3	LOS A	1.5	37.4	0.59	0.53	32.6
18x	R2	146	2.0	0.304	7.3	LOS A	1.5	37.4	0.59	0.53	31.8
Approach		274	2.0	0.304	7.3	LOS A	1.5	37.4	0.59	0.53	32.1
NorthEast: SB LK Wood Blvd											
1x	L2	320	2.0	0.643	13.2	LOS B	5.7	144.6	0.77	0.76	29.6
16ax	R1	250	2.0	0.643	13.2	LOS B	5.7	144.6	0.77	0.76	29.5
16x	R2	63	2.0	0.643	13.2	LOS B	5.7	144.6	0.77	0.76	29.1
Approach		633	2.0	0.643	13.2	LOS B	5.7	144.6	0.77	0.76	29.5
West: EB Sunset Ave											
5b	L3	124	2.0	0.690	14.5	LOS B	7.0	177.1	0.80	0.78	29.5
5a	L1	168	2.0	0.690	14.5	LOS B	7.0	177.1	0.80	0.78	29.1
12a	R1	411	2.0	0.690	14.5	LOS B	7.0	177.1	0.80	0.78	29.2
Approach		703	2.0	0.690	14.5	LOS B	7.0	177.1	0.80	0.78	29.3
SouthWest: NB US 101 Off											
5bx	L3	100	2.0	0.300	11.8	LOS B	1.2	31.1	0.73	0.74	29.8
5x	L2	1	2.0	0.300	11.8	LOS B	1.2	31.1	0.73	0.74	29.6
2x	T1	48	2.0	0.300	11.8	LOS B	1.2	31.1	0.73	0.74	29.7
12x	R2	113	2.0	0.169	7.3	LOS A	0.7	17.4	0.63	0.63	32.5
Approach		262	2.0	0.300	9.9	LOS A	1.2	31.1	0.69	0.70	30.9
All Vehicles		1872	2.0	0.690	12.3	LOS B	7.0	177.1	0.74	0.72	29.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Alliance Rd/Foster Ave - AM Future + The Village

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Alliance Rd											
3	L2	4	2.0	0.409	7.2	LOS A	2.5	63.5	0.46	0.31	22.6
8	T1	317	2.0	0.409	7.2	LOS A	2.5	63.5	0.46	0.31	22.6
18	R2	157	2.0	0.409	7.2	LOS A	2.5	63.5	0.46	0.31	22.4
Approach		478	2.0	0.409	7.2	LOS A	2.5	63.5	0.46	0.31	22.6
East: Foster Ave											
1	L2	250	2.0	0.342	7.1	LOS A	1.8	45.6	0.55	0.45	22.2
6	T1	7	2.0	0.342	7.1	LOS A	1.8	45.6	0.55	0.45	22.2
16	R2	88	2.0	0.342	7.1	LOS A	1.8	45.6	0.55	0.45	22.0
Approach		345	2.0	0.342	7.1	LOS A	1.8	45.6	0.55	0.45	22.1
North: Alliance Rd											
7	L2	162	2.0	0.563	10.8	LOS B	3.7	95.2	0.62	0.51	21.7
4	T1	407	2.0	0.563	10.8	LOS B	3.7	95.2	0.62	0.51	21.7
14	R2	4	2.0	0.563	10.8	LOS B	3.7	95.2	0.62	0.51	21.5
Approach		573	2.0	0.563	10.8	LOS B	3.7	95.2	0.62	0.51	21.7
West: Foster Ave											
5	L2	7	2.0	0.054	6.5	LOS A	0.2	5.2	0.62	0.58	22.7
2	T1	15	2.0	0.054	6.5	LOS A	0.2	5.2	0.62	0.58	22.7
12	R2	11	2.0	0.054	6.5	LOS A	0.2	5.2	0.62	0.58	22.4
Approach		33	2.0	0.054	6.5	LOS A	0.2	5.2	0.62	0.58	22.6
All Vehicles		1429	2.0	0.563	8.6	LOS A	3.7	95.2	0.55	0.43	22.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Intersection 3-4 PM Future + The Village

5-Leg Roundabout with northbound right-turn slip lane

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: NB LK Wood Blvd											
3ax	L1	202	2.0	0.968	51.6	LOS F	18.0	456.7	1.00	1.69	19.7
8x	T1	171	2.0	0.968	51.6	LOS F	18.0	456.7	1.00	1.69	19.8
18x	R2	282	2.0	0.968	51.6	LOS F	18.0	456.7	1.00	1.69	19.6
Approach		655	2.0	0.968	51.6	LOS F	18.0	456.7	1.00	1.69	19.7
NorthEast: SB LK Wood Blvd											
1x	L2	269	2.0	0.841	29.9	LOS D	9.8	248.0	0.97	1.27	24.4
16ax	R1	181	2.0	0.841	29.9	LOS D	9.8	248.0	0.97	1.27	24.3
16x	R2	151	2.0	0.841	29.9	LOS D	9.8	248.0	0.97	1.27	24.0
Approach		601	2.0	0.841	29.9	LOS D	9.8	248.0	0.97	1.27	24.2
West: EB Sunset Ave											
5b	L3	154	2.0	0.440	8.2	LOS A	2.6	67.0	0.56	0.44	31.5
5a	L1	201	2.0	0.440	8.2	LOS A	2.6	67.0	0.56	0.44	31.0
12a	R1	117	2.0	0.440	8.2	LOS A	2.6	67.0	0.56	0.44	31.1
Approach		472	2.0	0.440	8.2	LOS A	2.6	67.0	0.56	0.44	31.2
SouthWest: NB US 101 Off											
5bx	L3	139	2.0	0.552	14.7	LOS B	3.4	86.2	0.79	0.88	29.3
5x	L2	1	2.0	0.552	14.7	LOS B	3.4	86.2	0.79	0.88	29.1
2x	T1	226	2.0	0.552	14.7	LOS B	3.4	86.2	0.79	0.88	29.2
12x	R2	127	2.0	0.133	5.0	LOS A	0.6	14.7	0.49	0.39	33.6
Approach		493	2.0	0.552	12.2	LOS B	3.4	86.2	0.71	0.75	30.2
All Vehicles		2221	2.0	0.968	27.7	LOS D	18.0	456.7	0.83	1.10	24.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Alliance Rd/Foster Ave - PM Future + The Village

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Alliance Rd											
3	L2	18	2.0	0.558	9.6	LOS A	4.2	107.5	0.54	0.36	22.1
8	T1	493	2.0	0.558	9.6	LOS A	4.2	107.5	0.54	0.36	22.1
18	R2	153	2.0	0.558	9.6	LOS A	4.2	107.5	0.54	0.36	21.9
Approach		664	2.0	0.558	9.6	LOS A	4.2	107.5	0.54	0.36	22.1
East: Foster Ave											
1	L2	147	2.0	0.410	9.4	LOS A	2.2	55.5	0.67	0.68	21.9
6	T1	27	2.0	0.410	9.4	LOS A	2.2	55.5	0.67	0.68	21.9
16	R2	167	2.0	0.410	9.4	LOS A	2.2	55.5	0.67	0.68	21.6
Approach		341	2.0	0.410	9.4	LOS A	2.2	55.5	0.67	0.68	21.8
North: Alliance Rd											
7	L2	135	2.0	0.506	8.8	LOS A	3.5	88.3	0.53	0.38	22.2
4	T1	443	2.0	0.506	8.8	LOS A	3.5	88.3	0.53	0.38	22.2
14	R2	8	2.0	0.506	8.8	LOS A	3.5	88.3	0.53	0.38	22.0
Approach		586	2.0	0.506	8.8	LOS A	3.5	88.3	0.53	0.38	22.2
West: Foster Ave											
5	L2	7	2.0	0.067	6.1	LOS A	0.3	6.5	0.60	0.55	22.8
2	T1	22	2.0	0.067	6.1	LOS A	0.3	6.5	0.60	0.55	22.8
12	R2	16	2.0	0.067	6.1	LOS A	0.3	6.5	0.60	0.55	22.6
Approach		45	2.0	0.067	6.1	LOS A	0.3	6.5	0.60	0.55	22.7
All Vehicles		1636	2.0	0.558	9.1	LOS A	4.2	107.5	0.57	0.44	22.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Intersection 3-4 AM Future + Canyon Creek

5-Leg Roundabout with northbound right-turn slip lane

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: NB LK Wood Blvd											
3ax	L1	103	2.0	0.287	7.1	LOS A	1.4	34.9	0.58	0.53	32.3
8x	T1	27	2.0	0.287	7.1	LOS A	1.4	34.9	0.58	0.53	32.6
18x	R2	128	2.0	0.287	7.1	LOS A	1.4	34.9	0.58	0.53	31.9
Approach		258	2.0	0.287	7.1	LOS A	1.4	34.9	0.58	0.53	32.1
NorthEast: SB LK Wood Blvd											
1x	L2	247	2.0	0.562	11.1	LOS B	4.2	105.5	0.70	0.67	30.5
16ax	R1	240	2.0	0.562	11.1	LOS B	4.2	105.5	0.70	0.67	30.4
16x	R2	63	2.0	0.562	11.1	LOS B	4.2	105.5	0.70	0.67	30.0
Approach		550	2.0	0.562	11.1	LOS B	4.2	105.5	0.70	0.67	30.4
West: EB Sunset Ave											
5b	L3	127	2.0	0.651	12.4	LOS B	6.0	153.0	0.72	0.60	30.4
5a	L1	168	2.0	0.651	12.4	LOS B	6.0	153.0	0.72	0.60	29.9
12a	R1	419	2.0	0.651	12.4	LOS B	6.0	153.0	0.72	0.60	30.0
Approach		714	2.0	0.651	12.4	LOS B	6.0	153.0	0.72	0.60	30.0
SouthWest: NB US 101 Off											
5bx	L3	102	2.0	0.281	10.8	LOS B	1.1	28.9	0.71	0.72	30.2
5x	L2	1	2.0	0.281	10.8	LOS B	1.1	28.9	0.71	0.72	29.9
2x	T1	46	2.0	0.281	10.8	LOS B	1.1	28.9	0.71	0.72	30.0
12x	R2	113	2.0	0.158	6.8	LOS A	0.6	16.4	0.61	0.60	32.7
Approach		262	2.0	0.281	9.1	LOS A	1.1	28.9	0.67	0.67	31.2
All Vehicles		1784	2.0	0.651	10.8	LOS B	6.0	153.0	0.69	0.62	30.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Alliance Rd/Foster Ave - AM Future + Canyon Creek

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Alliance Rd											
3	L2	4	2.0	0.407	7.2	LOS A	2.5	63.0	0.46	0.31	22.6
8	T1	313	2.0	0.407	7.2	LOS A	2.5	63.0	0.46	0.31	22.7
18	R2	158	2.0	0.407	7.2	LOS A	2.5	63.0	0.46	0.31	22.4
Approach		475	2.0	0.407	7.2	LOS A	2.5	63.0	0.46	0.31	22.6
East: Foster Ave											
1	L2	255	2.0	0.348	7.2	LOS A	1.8	46.8	0.55	0.45	22.2
6	T1	7	2.0	0.348	7.2	LOS A	1.8	46.8	0.55	0.45	22.2
16	R2	91	2.0	0.348	7.2	LOS A	1.8	46.8	0.55	0.45	22.0
Approach		353	2.0	0.348	7.2	LOS A	1.8	46.8	0.55	0.45	22.1
North: Alliance Rd											
7	L2	163	2.0	0.552	10.6	LOS B	3.6	91.0	0.61	0.50	21.7
4	T1	392	2.0	0.552	10.6	LOS B	3.6	91.0	0.61	0.50	21.8
14	R2	4	2.0	0.552	10.6	LOS B	3.6	91.0	0.61	0.50	21.5
Approach		559	2.0	0.552	10.6	LOS B	3.6	91.0	0.61	0.50	21.8
West: Foster Ave											
5	L2	7	2.0	0.054	6.4	LOS A	0.2	5.1	0.62	0.58	22.7
2	T1	15	2.0	0.054	6.4	LOS A	0.2	5.1	0.62	0.58	22.7
12	R2	11	2.0	0.054	6.4	LOS A	0.2	5.1	0.62	0.58	22.4
Approach		33	2.0	0.054	6.4	LOS A	0.2	5.1	0.62	0.58	22.6
All Vehicles		1420	2.0	0.552	8.5	LOS A	3.6	91.0	0.55	0.43	22.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Intersection 3-4 PM Future + Canyon Creek

5-Leg Roundabout with northbound right-turn slip lane

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: NB LK Wood Blvd											
3ax	L1	212	2.0	0.877	35.6	LOS E	11.0	278.6	0.99	1.37	22.9
8x	T1	171	2.0	0.877	35.6	LOS E	11.0	278.6	0.99	1.37	23.1
18x	R2	209	2.0	0.877	35.6	LOS E	11.0	278.6	0.99	1.37	22.7
Approach		592	2.0	0.877	35.6	LOS E	11.0	278.6	0.99	1.37	22.9
NorthEast: SB LK Wood Blvd											
1x	L2	229	2.0	0.795	26.0	LOS D	8.0	202.6	0.93	1.18	25.4
16ax	R1	176	2.0	0.795	26.0	LOS D	8.0	202.6	0.93	1.18	25.4
16x	R2	151	2.0	0.795	26.0	LOS D	8.0	202.6	0.93	1.18	25.0
Approach		556	2.0	0.795	26.0	LOS D	8.0	202.6	0.93	1.18	25.3
West: EB Sunset Ave											
5b	L3	156	2.0	0.429	7.8	LOS A	2.6	66.2	0.52	0.38	31.7
5a	L1	201	2.0	0.429	7.8	LOS A	2.6	66.2	0.52	0.38	31.2
12a	R1	122	2.0	0.429	7.8	LOS A	2.6	66.2	0.52	0.38	31.3
Approach		479	2.0	0.429	7.8	LOS A	2.6	66.2	0.52	0.38	31.4
SouthWest: NB US 101 Off											
5bx	L3	149	2.0	0.534	13.8	LOS B	3.2	82.4	0.78	0.85	29.6
5x	L2	1	2.0	0.534	13.8	LOS B	3.2	82.4	0.78	0.85	29.4
2x	T1	216	2.0	0.534	13.8	LOS B	3.2	82.4	0.78	0.85	29.5
12x	R2	127	2.0	0.129	4.8	LOS A	0.6	14.3	0.47	0.36	33.7
Approach		493	2.0	0.534	11.5	LOS B	3.2	82.4	0.70	0.73	30.5
All Vehicles		2120	2.0	0.877	21.2	LOS C	11.0	278.6	0.80	0.95	26.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Alliance Rd/Foster Ave - PM Future + Canyon Creek

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Alliance Rd											
3	L2	18	2.0	0.553	9.5	LOS A	4.1	105.2	0.54	0.37	22.1
8	T1	478	2.0	0.553	9.5	LOS A	4.1	105.2	0.54	0.37	22.1
18	R2	159	2.0	0.553	9.5	LOS A	4.1	105.2	0.54	0.37	21.9
Approach		655	2.0	0.553	9.5	LOS A	4.1	105.2	0.54	0.37	22.1
East: Foster Ave											
1	L2	150	2.0	0.410	9.2	LOS A	2.2	55.5	0.66	0.67	21.9
6	T1	27	2.0	0.410	9.2	LOS A	2.2	55.5	0.66	0.67	21.9
16	R2	169	2.0	0.410	9.2	LOS A	2.2	55.5	0.66	0.67	21.7
Approach		346	2.0	0.410	9.2	LOS A	2.2	55.5	0.66	0.67	21.8
North: Alliance Rd											
7	L2	139	2.0	0.504	8.8	LOS A	3.4	87.5	0.54	0.38	22.2
4	T1	435	2.0	0.504	8.8	LOS A	3.4	87.5	0.54	0.38	22.2
14	R2	8	2.0	0.504	8.8	LOS A	3.4	87.5	0.54	0.38	22.0
Approach		582	2.0	0.504	8.8	LOS A	3.4	87.5	0.54	0.38	22.2
West: Foster Ave											
5	L2	7	2.0	0.067	6.1	LOS A	0.3	6.5	0.60	0.55	22.8
2	T1	22	2.0	0.067	6.1	LOS A	0.3	6.5	0.60	0.55	22.8
12	R2	16	2.0	0.067	6.1	LOS A	0.3	6.5	0.60	0.55	22.6
Approach		45	2.0	0.067	6.1	LOS A	0.3	6.5	0.60	0.55	22.7
All Vehicles		1628	2.0	0.553	9.1	LOS A	4.1	105.2	0.57	0.44	22.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Intersection 3-4 AM Future + Sunset Terrace

5-Leg Roundabout with northbound right-turn slip lane

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: NB LK Wood Blvd											
3ax	L1	105	2.0	0.291	7.1	LOS A	1.4	35.3	0.59	0.53	32.2
8x	T1	27	2.0	0.291	7.1	LOS A	1.4	35.3	0.59	0.53	32.6
18x	R2	128	2.0	0.291	7.1	LOS A	1.4	35.3	0.59	0.53	31.8
Approach		260	2.0	0.291	7.1	LOS A	1.4	35.3	0.59	0.53	32.1
NorthEast: SB LK Wood Blvd											
1x	L2	247	2.0	0.566	11.3	LOS B	4.2	107.0	0.71	0.68	30.5
16ax	R1	240	2.0	0.566	11.3	LOS B	4.2	107.0	0.71	0.68	30.4
16x	R2	63	2.0	0.566	11.3	LOS B	4.2	107.0	0.71	0.68	29.9
Approach		550	2.0	0.566	11.3	LOS B	4.2	107.0	0.71	0.68	30.4
West: EB Sunset Ave											
5b	L3	130	2.0	0.660	12.7	LOS B	6.3	159.1	0.73	0.61	30.2
5a	L1	168	2.0	0.660	12.7	LOS B	6.3	159.1	0.73	0.61	29.8
12a	R1	426	2.0	0.660	12.7	LOS B	6.3	159.1	0.73	0.61	29.9
Approach		724	2.0	0.660	12.7	LOS B	6.3	159.1	0.73	0.61	29.9
SouthWest: NB US 101 Off											
5bx	L3	104	2.0	0.288	11.1	LOS B	1.2	29.8	0.72	0.72	30.1
5x	L2	1	2.0	0.288	11.1	LOS B	1.2	29.8	0.72	0.72	29.8
2x	T1	46	2.0	0.288	11.1	LOS B	1.2	29.8	0.72	0.72	29.9
12x	R2	113	2.0	0.159	6.8	LOS A	0.7	16.5	0.62	0.60	32.7
Approach		264	2.0	0.288	9.2	LOS A	1.2	29.8	0.67	0.67	31.1
All Vehicles		1798	2.0	0.660	10.9	LOS B	6.3	159.1	0.69	0.63	30.5

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Alliance Rd/Foster Ave - AM Future + Sunset Terrace

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Alliance Rd											
3	L2	4	2.0	0.408	7.2	LOS A	2.5	63.2	0.46	0.32	22.6
8	T1	313	2.0	0.408	7.2	LOS A	2.5	63.2	0.46	0.32	22.6
18	R2	159	2.0	0.408	7.2	LOS A	2.5	63.2	0.46	0.32	22.4
Approach		476	2.0	0.408	7.2	LOS A	2.5	63.2	0.46	0.32	22.6
East: Foster Ave											
1	L2	259	2.0	0.355	7.3	LOS A	1.9	48.0	0.55	0.45	22.2
6	T1	7	2.0	0.355	7.3	LOS A	1.9	48.0	0.55	0.45	22.2
16	R2	94	2.0	0.355	7.3	LOS A	1.9	48.0	0.55	0.45	22.0
Approach		360	2.0	0.355	7.3	LOS A	1.9	48.0	0.55	0.45	22.1
North: Alliance Rd											
7	L2	164	2.0	0.555	10.7	LOS B	3.6	92.5	0.62	0.51	21.7
4	T1	392	2.0	0.555	10.7	LOS B	3.6	92.5	0.62	0.51	21.8
14	R2	4	2.0	0.555	10.7	LOS B	3.6	92.5	0.62	0.51	21.5
Approach		560	2.0	0.555	10.7	LOS B	3.6	92.5	0.62	0.51	21.7
West: Foster Ave											
5	L2	7	2.0	0.054	6.5	LOS A	0.2	5.1	0.62	0.58	22.7
2	T1	15	2.0	0.054	6.5	LOS A	0.2	5.1	0.62	0.58	22.7
12	R2	11	2.0	0.054	6.5	LOS A	0.2	5.1	0.62	0.58	22.4
Approach		33	2.0	0.054	6.5	LOS A	0.2	5.1	0.62	0.58	22.6
All Vehicles		1429	2.0	0.555	8.6	LOS A	3.6	92.5	0.55	0.43	22.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Intersection 3-4 PM Future + Sunset Terrace

5-Leg Roundabout with northbound right-turn slip lane

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: NB LK Wood Blvd											
3ax	L1	218	2.0	0.892	37.9	LOS E	11.7	298.2	1.00	1.42	22.4
8x	T1	171	2.0	0.892	37.9	LOS E	11.7	298.2	1.00	1.42	22.6
18x	R2	209	2.0	0.892	37.9	LOS E	11.7	298.2	1.00	1.42	22.2
Approach		598	2.0	0.892	37.9	LOS E	11.7	298.2	1.00	1.42	22.4
NorthEast: SB LK Wood Blvd											
1x	L2	229	2.0	0.806	27.2	LOS D	8.2	209.0	0.94	1.20	25.1
16ax	R1	176	2.0	0.806	27.2	LOS D	8.2	209.0	0.94	1.20	25.0
16x	R2	151	2.0	0.806	27.2	LOS D	8.2	209.0	0.94	1.20	24.7
Approach		556	2.0	0.806	27.2	LOS D	8.2	209.0	0.94	1.20	25.0
West: EB Sunset Ave											
5b	L3	157	2.0	0.433	7.8	LOS A	2.6	67.3	0.52	0.39	31.6
5a	L1	201	2.0	0.433	7.8	LOS A	2.6	67.3	0.52	0.39	31.2
12a	R1	126	2.0	0.433	7.8	LOS A	2.6	67.3	0.52	0.39	31.3
Approach		484	2.0	0.433	7.8	LOS A	2.6	67.3	0.52	0.39	31.3
SouthWest: NB US 101 Off											
5bx	L3	155	2.0	0.545	14.1	LOS B	3.4	85.4	0.78	0.87	29.4
5x	L2	1	2.0	0.545	14.1	LOS B	3.4	85.4	0.78	0.87	29.2
2x	T1	216	2.0	0.545	14.1	LOS B	3.4	85.4	0.78	0.87	29.3
12x	R2	127	2.0	0.129	4.9	LOS A	0.6	14.3	0.47	0.36	33.7
Approach		499	2.0	0.545	11.8	LOS B	3.4	85.4	0.70	0.74	30.3
All Vehicles		2137	2.0	0.892	22.2	LOS C	11.7	298.2	0.81	0.97	26.4

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Alliance Rd/Foster Ave - PM Future + Sunset Terrace

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Alliance Rd											
3	L2	18	2.0	0.556	9.6	LOS A	4.2	106.3	0.55	0.37	22.1
8	T1	478	2.0	0.556	9.6	LOS A	4.2	106.3	0.55	0.37	22.1
18	R2	162	2.0	0.556	9.6	LOS A	4.2	106.3	0.55	0.37	21.9
Approach		658	2.0	0.556	9.6	LOS A	4.2	106.3	0.55	0.37	22.1
East: Foster Ave											
1	L2	152	2.0	0.414	9.3	LOS A	2.2	56.4	0.67	0.67	21.9
6	T1	27	2.0	0.414	9.3	LOS A	2.2	56.4	0.67	0.67	21.9
16	R2	170	2.0	0.414	9.3	LOS A	2.2	56.4	0.67	0.67	21.7
Approach		349	2.0	0.414	9.3	LOS A	2.2	56.4	0.67	0.67	21.8
North: Alliance Rd											
7	L2	141	2.0	0.507	8.8	LOS A	3.5	88.2	0.54	0.38	22.2
4	T1	435	2.0	0.507	8.8	LOS A	3.5	88.2	0.54	0.38	22.2
14	R2	8	2.0	0.507	8.8	LOS A	3.5	88.2	0.54	0.38	21.9
Approach		584	2.0	0.507	8.8	LOS A	3.5	88.2	0.54	0.38	22.2
West: Foster Ave											
5	L2	7	2.0	0.067	6.1	LOS A	0.3	6.6	0.60	0.55	22.8
2	T1	22	2.0	0.067	6.1	LOS A	0.3	6.6	0.60	0.55	22.8
12	R2	16	2.0	0.067	6.1	LOS A	0.3	6.6	0.60	0.55	22.6
Approach		45	2.0	0.067	6.1	LOS A	0.3	6.6	0.60	0.55	22.7
All Vehicles		1636	2.0	0.556	9.2	LOS A	4.2	106.3	0.57	0.44	22.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Intersection 3-4 AM Future + Open Door

5-Leg Roundabout with northbound right-turn slip lane

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: NB LK Wood Blvd											
3ax	L1	104	2.0	0.290	7.1	LOS A	1.4	35.2	0.59	0.53	32.2
8x	T1	27	2.0	0.290	7.1	LOS A	1.4	35.2	0.59	0.53	32.6
18x	R2	128	2.0	0.290	7.1	LOS A	1.4	35.2	0.59	0.53	31.8
Approach		259	2.0	0.290	7.1	LOS A	1.4	35.2	0.59	0.53	32.1
NorthEast: SB LK Wood Blvd											
1x	L2	247	2.0	0.566	11.3	LOS B	4.2	107.0	0.71	0.68	30.5
16ax	R1	240	2.0	0.566	11.3	LOS B	4.2	107.0	0.71	0.68	30.4
16x	R2	63	2.0	0.566	11.3	LOS B	4.2	107.0	0.71	0.68	29.9
Approach		550	2.0	0.566	11.3	LOS B	4.2	107.0	0.71	0.68	30.4
West: EB Sunset Ave											
5b	L3	126	2.0	0.643	12.2	LOS B	5.8	148.3	0.71	0.59	30.4
5a	L1	168	2.0	0.643	12.2	LOS B	5.8	148.3	0.71	0.59	30.0
12a	R1	412	2.0	0.643	12.2	LOS B	5.8	148.3	0.71	0.59	30.1
Approach		706	2.0	0.643	12.2	LOS B	5.8	148.3	0.71	0.59	30.1
SouthWest: NB US 101 Off											
5bx	L3	109	2.0	0.292	11.0	LOS B	1.2	30.5	0.71	0.72	30.1
5x	L2	1	2.0	0.292	11.0	LOS B	1.2	30.5	0.71	0.72	29.9
2x	T1	46	2.0	0.292	11.0	LOS B	1.2	30.5	0.71	0.72	29.9
12x	R2	113	2.0	0.157	6.7	LOS A	0.6	16.3	0.61	0.59	32.8
Approach		269	2.0	0.292	9.2	LOS A	1.2	30.5	0.67	0.67	31.1
All Vehicles		1784	2.0	0.643	10.7	LOS B	5.8	148.3	0.69	0.62	30.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Alliance Rd/Foster Ave - AM Future + Open Door

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Alliance Rd											
3	L2	4	2.0	0.422	7.5	LOS A	2.6	66.0	0.48	0.33	22.6
8	T1	313	2.0	0.422	7.5	LOS A	2.6	66.0	0.48	0.33	22.6
18	R2	171	2.0	0.422	7.5	LOS A	2.6	66.0	0.48	0.33	22.3
Approach		488	2.0	0.422	7.5	LOS A	2.6	66.0	0.48	0.33	22.5
East: Foster Ave											
1	L2	254	2.0	0.347	7.2	LOS A	1.8	46.4	0.55	0.45	22.2
6	T1	7	2.0	0.347	7.2	LOS A	1.8	46.4	0.55	0.45	22.2
16	R2	90	2.0	0.347	7.2	LOS A	1.8	46.4	0.55	0.45	22.0
Approach		351	2.0	0.347	7.2	LOS A	1.8	46.4	0.55	0.45	22.1
North: Alliance Rd											
7	L2	171	2.0	0.559	10.7	LOS B	3.7	93.9	0.62	0.51	21.7
4	T1	392	2.0	0.559	10.7	LOS B	3.7	93.9	0.62	0.51	21.7
14	R2	4	2.0	0.559	10.7	LOS B	3.7	93.9	0.62	0.51	21.5
Approach		567	2.0	0.559	10.7	LOS B	3.7	93.9	0.62	0.51	21.7
West: Foster Ave											
5	L2	7	2.0	0.054	6.5	LOS A	0.2	5.2	0.62	0.58	22.7
2	T1	15	2.0	0.054	6.5	LOS A	0.2	5.2	0.62	0.58	22.7
12	R2	11	2.0	0.054	6.5	LOS A	0.2	5.2	0.62	0.58	22.4
Approach		33	2.0	0.054	6.5	LOS A	0.2	5.2	0.62	0.58	22.6
All Vehicles		1439	2.0	0.559	8.7	LOS A	3.7	93.9	0.55	0.44	22.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Intersection 3-4 PM Future + Open Door

5-Leg Roundabout with northbound right-turn slip lane

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: NB LK Wood Blvd											
3ax	L1	204	2.0	0.866	34.1	LOS D	10.4	264.6	0.98	1.34	23.3
8x	T1	171	2.0	0.866	34.1	LOS D	10.4	264.6	0.98	1.34	23.5
18x	R2	209	2.0	0.866	34.1	LOS D	10.4	264.6	0.98	1.34	23.1
Approach		584	2.0	0.866	34.1	LOS D	10.4	264.6	0.98	1.34	23.3
NorthEast: SB LK Wood Blvd											
1x	L2	229	2.0	0.790	25.4	LOS D	7.8	199.3	0.93	1.16	25.6
16ax	R1	176	2.0	0.790	25.4	LOS D	7.8	199.3	0.93	1.16	25.5
16x	R2	151	2.0	0.790	25.4	LOS D	7.8	199.3	0.93	1.16	25.2
Approach		556	2.0	0.790	25.4	LOS D	7.8	199.3	0.93	1.16	25.5
West: EB Sunset Ave											
5b	L3	162	2.0	0.433	7.8	LOS A	2.6	67.3	0.52	0.39	31.6
5a	L1	201	2.0	0.433	7.8	LOS A	2.6	67.3	0.52	0.39	31.1
12a	R1	121	2.0	0.433	7.8	LOS A	2.6	67.3	0.52	0.39	31.3
Approach		484	2.0	0.433	7.8	LOS A	2.6	67.3	0.52	0.39	31.3
SouthWest: NB US 101 Off											
5bx	L3	144	2.0	0.529	13.7	LOS B	3.2	81.0	0.77	0.85	29.7
5x	L2	1	2.0	0.529	13.7	LOS B	3.2	81.0	0.77	0.85	29.4
2x	T1	216	2.0	0.529	13.7	LOS B	3.2	81.0	0.77	0.85	29.5
12x	R2	127	2.0	0.129	4.8	LOS A	0.6	14.3	0.47	0.36	33.7
Approach		488	2.0	0.529	11.4	LOS B	3.2	81.0	0.69	0.72	30.5
All Vehicles		2112	2.0	0.866	20.6	LOS C	10.4	264.6	0.80	0.93	27.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Alliance Rd/Foster Ave - PM Future + Open Door

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Alliance Rd											
3	L2	18	2.0	0.555	9.5	LOS A	4.2	105.9	0.54	0.37	22.1
8	T1	478	2.0	0.555	9.5	LOS A	4.2	105.9	0.54	0.37	22.1
18	R2	161	2.0	0.555	9.5	LOS A	4.2	105.9	0.54	0.37	21.9
Approach		657	2.0	0.555	9.5	LOS A	4.2	105.9	0.54	0.37	22.1
East: Foster Ave											
1	L2	166	2.0	0.441	9.8	LOS A	2.5	63.1	0.68	0.70	21.8
6	T1	27	2.0	0.441	9.8	LOS A	2.5	63.1	0.68	0.70	21.8
16	R2	179	2.0	0.441	9.8	LOS A	2.5	63.1	0.68	0.70	21.5
Approach		372	2.0	0.441	9.8	LOS A	2.5	63.1	0.68	0.70	21.7
North: Alliance Rd											
7	L2	140	2.0	0.514	9.0	LOS A	3.5	89.0	0.56	0.41	22.1
4	T1	435	2.0	0.514	9.0	LOS A	3.5	89.0	0.56	0.41	22.1
14	R2	8	2.0	0.514	9.0	LOS A	3.5	89.0	0.56	0.41	21.9
Approach		583	2.0	0.514	9.0	LOS A	3.5	89.0	0.56	0.41	22.1
West: Foster Ave											
5	L2	7	2.0	0.068	6.2	LOS A	0.3	6.6	0.61	0.56	22.8
2	T1	22	2.0	0.068	6.2	LOS A	0.3	6.6	0.61	0.56	22.8
12	R2	16	2.0	0.068	6.2	LOS A	0.3	6.6	0.61	0.56	22.5
Approach		45	2.0	0.068	6.2	LOS A	0.3	6.6	0.61	0.56	22.7
All Vehicles		1657	2.0	0.555	9.3	LOS A	4.2	105.9	0.58	0.46	22.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Intersection 3-4 AM Future + Twin Parks

5-Leg Roundabout with northbound right-turn slip lane

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: NB LK Wood Blvd											
3ax	L1	102	2.0	0.286	7.0	LOS A	1.4	34.6	0.58	0.52	32.3
8x	T1	27	2.0	0.286	7.0	LOS A	1.4	34.6	0.58	0.52	32.6
18x	R2	128	2.0	0.286	7.0	LOS A	1.4	34.6	0.58	0.52	31.9
Approach		257	2.0	0.286	7.0	LOS A	1.4	34.6	0.58	0.52	32.1
NorthEast: SB LK Wood Blvd											
1x	L2	247	2.0	0.561	11.1	LOS B	4.1	104.9	0.70	0.66	30.6
16ax	R1	240	2.0	0.561	11.1	LOS B	4.1	104.9	0.70	0.66	30.5
16x	R2	63	2.0	0.561	11.1	LOS B	4.1	104.9	0.70	0.66	30.0
Approach		550	2.0	0.561	11.1	LOS B	4.1	104.9	0.70	0.66	30.5
West: EB Sunset Ave											
5b	L3	126	2.0	0.646	12.3	LOS B	5.9	150.1	0.71	0.60	30.4
5a	L1	168	2.0	0.646	12.3	LOS B	5.9	150.1	0.71	0.60	29.9
12a	R1	415	2.0	0.646	12.3	LOS B	5.9	150.1	0.71	0.60	30.1
Approach		709	2.0	0.646	12.3	LOS B	5.9	150.1	0.71	0.60	30.1
SouthWest: NB US 101 Off											
5bx	L3	101	2.0	0.278	10.7	LOS B	1.1	28.5	0.71	0.71	30.2
5x	L2	1	2.0	0.278	10.7	LOS B	1.1	28.5	0.71	0.71	30.0
2x	T1	46	2.0	0.278	10.7	LOS B	1.1	28.5	0.71	0.71	30.1
12x	R2	113	2.0	0.157	6.7	LOS A	0.6	16.4	0.61	0.59	32.8
Approach		261	2.0	0.278	9.0	LOS A	1.1	28.5	0.67	0.66	31.2
All Vehicles		1777	2.0	0.646	10.7	LOS B	5.9	150.1	0.68	0.62	30.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Alliance Rd/Foster Ave - AM Future + Twin Parks

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Alliance Rd											
3	L2	4	2.0	0.406	7.2	LOS A	2.5	62.8	0.46	0.31	22.6
8	T1	313	2.0	0.406	7.2	LOS A	2.5	62.8	0.46	0.31	22.7
18	R2	157	2.0	0.406	7.2	LOS A	2.5	62.8	0.46	0.31	22.4
Approach		474	2.0	0.406	7.2	LOS A	2.5	62.8	0.46	0.31	22.6
East: Foster Ave											
1	L2	250	2.0	0.343	7.1	LOS A	1.8	45.7	0.54	0.45	22.2
6	T1	7	2.0	0.343	7.1	LOS A	1.8	45.7	0.54	0.45	22.2
16	R2	90	2.0	0.343	7.1	LOS A	1.8	45.7	0.54	0.45	22.0
Approach		347	2.0	0.343	7.1	LOS A	1.8	45.7	0.54	0.45	22.2
North: Alliance Rd											
7	L2	163	2.0	0.549	10.5	LOS B	3.5	89.7	0.61	0.49	21.8
4	T1	392	2.0	0.549	10.5	LOS B	3.5	89.7	0.61	0.49	21.8
14	R2	4	2.0	0.549	10.5	LOS B	3.5	89.7	0.61	0.49	21.6
Approach		559	2.0	0.549	10.5	LOS B	3.5	89.7	0.61	0.49	21.8
West: Foster Ave											
5	L2	7	2.0	0.053	6.4	LOS A	0.2	5.1	0.62	0.57	22.7
2	T1	15	2.0	0.053	6.4	LOS A	0.2	5.1	0.62	0.57	22.7
12	R2	11	2.0	0.053	6.4	LOS A	0.2	5.1	0.62	0.57	22.4
Approach		33	2.0	0.053	6.4	LOS A	0.2	5.1	0.62	0.57	22.6
All Vehicles		1413	2.0	0.549	8.5	LOS A	3.5	89.7	0.54	0.42	22.2

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Intersection 3-4 PM Future + Twin Parks

5-Leg Roundabout with northbound right-turn slip lane

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: NB LK Wood Blvd											
3ax	L1	207	2.0	0.864	33.8	LOS D	10.4	264.0	0.98	1.33	23.4
8x	T1	171	2.0	0.864	33.8	LOS D	10.4	264.0	0.98	1.33	23.5
18x	R2	209	2.0	0.864	33.8	LOS D	10.4	264.0	0.98	1.33	23.2
Approach		587	2.0	0.864	33.8	LOS D	10.4	264.0	0.98	1.33	23.3
NorthEast: SB LK Wood Blvd											
1x	L2	229	2.0	0.786	25.1	LOS D	7.8	197.5	0.93	1.16	25.7
16ax	R1	176	2.0	0.786	25.1	LOS D	7.8	197.5	0.93	1.16	25.6
16x	R2	151	2.0	0.786	25.1	LOS D	7.8	197.5	0.93	1.16	25.3
Approach		556	2.0	0.786	25.1	LOS D	7.8	197.5	0.93	1.16	25.6
West: EB Sunset Ave											
5b	L3	155	2.0	0.426	7.7	LOS A	2.6	65.6	0.52	0.38	31.7
5a	L1	201	2.0	0.426	7.7	LOS A	2.6	65.6	0.52	0.38	31.2
12a	R1	120	2.0	0.426	7.7	LOS A	2.6	65.6	0.52	0.38	31.3
Approach		476	2.0	0.426	7.7	LOS A	2.6	65.6	0.52	0.38	31.4
SouthWest: NB US 101 Off											
5bx	L3	144	2.0	0.525	13.5	LOS B	3.2	80.1	0.77	0.85	29.7
5x	L2	1	2.0	0.525	13.5	LOS B	3.2	80.1	0.77	0.85	29.5
2x	T1	216	2.0	0.525	13.5	LOS B	3.2	80.1	0.77	0.85	29.6
12x	R2	127	2.0	0.128	4.8	LOS A	0.6	14.2	0.47	0.36	33.7
Approach		488	2.0	0.525	11.2	LOS B	3.2	80.1	0.69	0.72	30.6
All Vehicles		2107	2.0	0.864	20.4	LOS C	10.4	264.0	0.80	0.93	27.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Alliance Rd/Foster Ave - PM Future + Twin Parks

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Alliance Rd											
3	L2	18	2.0	0.548	9.4	LOS A	4.1	103.5	0.54	0.36	22.1
8	T1	478	2.0	0.548	9.4	LOS A	4.1	103.5	0.54	0.36	22.2
18	R2	153	2.0	0.548	9.4	LOS A	4.1	103.5	0.54	0.36	21.9
Approach		649	2.0	0.548	9.4	LOS A	4.1	103.5	0.54	0.36	22.1
East: Foster Ave											
1	L2	147	2.0	0.408	9.2	LOS A	2.2	55.0	0.66	0.67	21.9
6	T1	27	2.0	0.408	9.2	LOS A	2.2	55.0	0.66	0.67	21.9
16	R2	170	2.0	0.408	9.2	LOS A	2.2	55.0	0.66	0.67	21.7
Approach		344	2.0	0.408	9.2	LOS A	2.2	55.0	0.66	0.67	21.8
North: Alliance Rd											
7	L2	140	2.0	0.504	8.7	LOS A	3.4	87.5	0.53	0.37	22.2
4	T1	435	2.0	0.504	8.7	LOS A	3.4	87.5	0.53	0.37	22.2
14	R2	8	2.0	0.504	8.7	LOS A	3.4	87.5	0.53	0.37	22.0
Approach		583	2.0	0.504	8.7	LOS A	3.4	87.5	0.53	0.37	22.2
West: Foster Ave											
5	L2	7	2.0	0.067	6.1	LOS A	0.3	6.5	0.60	0.55	22.8
2	T1	22	2.0	0.067	6.1	LOS A	0.3	6.5	0.60	0.55	22.8
12	R2	16	2.0	0.067	6.1	LOS A	0.3	6.5	0.60	0.55	22.6
Approach		45	2.0	0.067	6.1	LOS A	0.3	6.5	0.60	0.55	22.7
All Vehicles		1621	2.0	0.548	9.0	LOS A	4.1	103.5	0.56	0.44	22.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Intersection 3-4 AM Future + Creekside

5-Leg Roundabout with northbound right-turn slip lane

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: NB LK Wood Blvd											
3ax	L1	102	2.0	0.287	7.1	LOS A	1.4	34.7	0.58	0.53	32.3
8x	T1	27	2.0	0.287	7.1	LOS A	1.4	34.7	0.58	0.53	32.6
18x	R2	128	2.0	0.287	7.1	LOS A	1.4	34.7	0.58	0.53	31.9
Approach		257	2.0	0.287	7.1	LOS A	1.4	34.7	0.58	0.53	32.1
NorthEast: SB LK Wood Blvd											
1x	L2	247	2.0	0.562	11.1	LOS B	4.2	105.5	0.70	0.67	30.5
16ax	R1	240	2.0	0.562	11.1	LOS B	4.2	105.5	0.70	0.67	30.4
16x	R2	63	2.0	0.562	11.1	LOS B	4.2	105.5	0.70	0.67	30.0
Approach		550	2.0	0.562	11.1	LOS B	4.2	105.5	0.70	0.67	30.4
West: EB Sunset Ave											
5b	L3	130	2.0	0.649	12.4	LOS B	6.0	151.8	0.71	0.60	30.4
5a	L1	168	2.0	0.649	12.4	LOS B	6.0	151.8	0.71	0.60	29.9
12a	R1	414	2.0	0.649	12.4	LOS B	6.0	151.8	0.71	0.60	30.0
Approach		712	2.0	0.649	12.4	LOS B	6.0	151.8	0.71	0.60	30.1
SouthWest: NB US 101 Off											
5bx	L3	100	2.0	0.277	10.7	LOS B	1.1	28.3	0.71	0.71	30.2
5x	L2	1	2.0	0.277	10.7	LOS B	1.1	28.3	0.71	0.71	30.0
2x	T1	46	2.0	0.277	10.7	LOS B	1.1	28.3	0.71	0.71	30.1
12x	R2	113	2.0	0.157	6.7	LOS A	0.6	16.4	0.61	0.59	32.8
Approach		260	2.0	0.277	9.0	LOS A	1.1	28.3	0.67	0.66	31.2
All Vehicles		1779	2.0	0.649	10.7	LOS B	6.0	151.8	0.68	0.62	30.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Alliance Rd/Foster Ave - AM Future + Creekside

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Alliance Rd											
3	L2	4	2.0	0.423	7.4	LOS A	2.6	66.7	0.47	0.32	22.6
8	T1	324	2.0	0.423	7.4	LOS A	2.6	66.7	0.47	0.32	22.6
18	R2	166	2.0	0.423	7.4	LOS A	2.6	66.7	0.47	0.32	22.3
Approach		494	2.0	0.423	7.4	LOS A	2.6	66.7	0.47	0.32	22.5
East: Foster Ave											
1	L2	254	2.0	0.348	7.2	LOS A	1.8	46.5	0.55	0.46	22.2
6	T1	7	2.0	0.348	7.2	LOS A	1.8	46.5	0.55	0.46	22.2
16	R2	88	2.0	0.348	7.2	LOS A	1.8	46.5	0.55	0.46	22.0
Approach		349	2.0	0.348	7.2	LOS A	1.8	46.5	0.55	0.46	22.1
North: Alliance Rd											
7	L2	162	2.0	0.555	10.7	LOS B	3.6	92.3	0.61	0.51	21.7
4	T1	397	2.0	0.555	10.7	LOS B	3.6	92.3	0.61	0.51	21.8
14	R2	4	2.0	0.555	10.7	LOS B	3.6	92.3	0.61	0.51	21.5
Approach		563	2.0	0.555	10.7	LOS B	3.6	92.3	0.61	0.51	21.8
West: Foster Ave											
5	L2	7	2.0	0.054	6.5	LOS A	0.2	5.1	0.62	0.58	22.7
2	T1	15	2.0	0.054	6.5	LOS A	0.2	5.1	0.62	0.58	22.7
12	R2	11	2.0	0.054	6.5	LOS A	0.2	5.1	0.62	0.58	22.4
Approach		33	2.0	0.054	6.5	LOS A	0.2	5.1	0.62	0.58	22.6
All Vehicles		1439	2.0	0.555	8.6	LOS A	3.6	92.3	0.55	0.43	22.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Alliance Rd/Foster Ave - AM Future + Creekside w Foster Ave Connection

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Alliance Rd											
3	L2	31	2.0	0.391	7.2	LOS A	2.3	57.8	0.49	0.36	22.6
8	T1	271	2.0	0.391	7.2	LOS A	2.3	57.8	0.49	0.36	22.6
18	R2	136	2.0	0.391	7.2	LOS A	2.3	57.8	0.49	0.36	22.4
Approach		438	2.0	0.391	7.2	LOS A	2.3	57.8	0.49	0.36	22.5
East: Foster Ave											
1	L2	215	2.0	0.358	7.5	LOS A	1.9	47.6	0.57	0.49	22.2
6	T1	46	2.0	0.358	7.5	LOS A	1.9	47.6	0.57	0.49	22.2
16	R2	88	2.0	0.358	7.5	LOS A	1.9	47.6	0.57	0.49	22.0
Approach		349	2.0	0.358	7.5	LOS A	1.9	47.6	0.57	0.49	22.1
North: Alliance Rd											
7	L2	120	2.0	0.419	8.3	LOS A	2.2	56.6	0.55	0.44	22.2
4	T1	251	2.0	0.419	8.3	LOS A	2.2	56.6	0.55	0.44	22.3
14	R2	43	2.0	0.419	8.3	LOS A	2.2	56.6	0.55	0.44	22.0
Approach		414	2.0	0.419	8.3	LOS A	2.2	56.6	0.55	0.44	22.2
West: Foster Ave											
5	L2	60	2.0	0.204	6.9	LOS A	0.9	22.2	0.60	0.58	22.5
2	T1	44	2.0	0.204	6.9	LOS A	0.9	22.2	0.60	0.58	22.5
12	R2	54	2.0	0.204	6.9	LOS A	0.9	22.2	0.60	0.58	22.2
Approach		158	2.0	0.204	6.9	LOS A	0.9	22.2	0.60	0.58	22.4
All Vehicles		1359	2.0	0.419	7.6	LOS A	2.3	57.8	0.54	0.44	22.3

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Intersection 3-4 PM Future + Creekside

5-Leg Roundabout with northbound right-turn slip lane

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: NB LK Wood Blvd											
3ax	L1	205	2.0	0.859	33.1	LOS D	10.2	258.9	0.98	1.32	23.5
8x	T1	171	2.0	0.859	33.1	LOS D	10.2	258.9	0.98	1.32	23.7
18x	R2	209	2.0	0.859	33.1	LOS D	10.2	258.9	0.98	1.32	23.3
Approach		585	2.0	0.859	33.1	LOS D	10.2	258.9	0.98	1.32	23.5
NorthEast: SB LK Wood Blvd											
1x	L2	229	2.0	0.783	24.8	LOS C	7.7	195.7	0.92	1.15	25.8
16ax	R1	176	2.0	0.783	24.8	LOS C	7.7	195.7	0.92	1.15	25.7
16x	R2	151	2.0	0.783	24.8	LOS C	7.7	195.7	0.92	1.15	25.4
Approach		556	2.0	0.783	24.8	LOS C	7.7	195.7	0.92	1.15	25.7
West: EB Sunset Ave											
5b	L3	158	2.0	0.428	7.7	LOS A	2.6	66.0	0.52	0.38	31.7
5a	L1	201	2.0	0.428	7.7	LOS A	2.6	66.0	0.52	0.38	31.2
12a	R1	119	2.0	0.428	7.7	LOS A	2.6	66.0	0.52	0.38	31.3
Approach		478	2.0	0.428	7.7	LOS A	2.6	66.0	0.52	0.38	31.4
SouthWest: NB US 101 Off											
5bx	L3	139	2.0	0.519	13.3	LOS B	3.1	78.4	0.77	0.84	29.8
5x	L2	1	2.0	0.519	13.3	LOS B	3.1	78.4	0.77	0.84	29.6
2x	T1	216	2.0	0.519	13.3	LOS B	3.1	78.4	0.77	0.84	29.7
12x	R2	127	2.0	0.128	4.8	LOS A	0.6	14.2	0.47	0.36	33.7
Approach		483	2.0	0.519	11.1	LOS B	3.1	78.4	0.69	0.71	30.6
All Vehicles		2102	2.0	0.859	20.1	LOS C	10.2	258.9	0.79	0.92	27.1

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Alliance Rd/Foster Ave - PM Future + Creekside

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Alliance Rd											
3	L2	18	2.0	0.559	9.6	LOS A	4.2	107.8	0.54	0.36	22.1
8	T1	488	2.0	0.559	9.6	LOS A	4.2	107.8	0.54	0.36	22.1
18	R2	159	2.0	0.559	9.6	LOS A	4.2	107.8	0.54	0.36	21.9
Approach		665	2.0	0.559	9.6	LOS A	4.2	107.8	0.54	0.36	22.1
East: Foster Ave											
1	L2	157	2.0	0.420	9.5	LOS A	2.3	57.9	0.67	0.69	21.8
6	T1	27	2.0	0.420	9.5	LOS A	2.3	57.9	0.67	0.69	21.9
16	R2	167	2.0	0.420	9.5	LOS A	2.3	57.9	0.67	0.69	21.6
Approach		351	2.0	0.420	9.5	LOS A	2.3	57.9	0.67	0.69	21.7
North: Alliance Rd											
7	L2	135	2.0	0.516	9.0	LOS A	3.6	90.4	0.55	0.40	22.1
4	T1	448	2.0	0.516	9.0	LOS A	3.6	90.4	0.55	0.40	22.2
14	R2	8	2.0	0.516	9.0	LOS A	3.6	90.4	0.55	0.40	21.9
Approach		591	2.0	0.516	9.0	LOS A	3.6	90.4	0.55	0.40	22.1
West: Foster Ave											
5	L2	7	2.0	0.068	6.2	LOS A	0.3	6.6	0.61	0.56	22.8
2	T1	22	2.0	0.068	6.2	LOS A	0.3	6.6	0.61	0.56	22.8
12	R2	16	2.0	0.068	6.2	LOS A	0.3	6.6	0.61	0.56	22.5
Approach		45	2.0	0.068	6.2	LOS A	0.3	6.6	0.61	0.56	22.7
All Vehicles		1652	2.0	0.559	9.3	LOS A	4.2	107.8	0.57	0.45	22.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Alliance Rd/Foster Ave - PM Future + Creekside w Foster Ave Connection

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Alliance Rd											
3	L2	68	2.0	0.584	10.6	LOS B	4.4	112.5	0.63	0.48	21.8
8	T1	444	2.0	0.584	10.6	LOS B	4.4	112.5	0.63	0.48	21.9
18	R2	142	2.0	0.584	10.6	LOS B	4.4	112.5	0.63	0.48	21.6
Approach		654	2.0	0.584	10.6	LOS B	4.4	112.5	0.63	0.48	21.8
East: Foster Ave											
1	L2	138	2.0	0.442	10.3	LOS B	2.5	62.5	0.70	0.75	21.7
6	T1	46	2.0	0.442	10.3	LOS B	2.5	62.5	0.70	0.75	21.7
16	R2	167	2.0	0.442	10.3	LOS B	2.5	62.5	0.70	0.75	21.5
Approach		351	2.0	0.442	10.3	LOS B	2.5	62.5	0.70	0.75	21.6
North: Alliance Rd											
7	L2	135	2.0	0.543	9.9	LOS A	3.8	95.6	0.62	0.49	21.9
4	T1	409	2.0	0.543	9.9	LOS A	3.8	95.6	0.62	0.49	22.0
14	R2	47	2.0	0.543	9.9	LOS A	3.8	95.6	0.62	0.49	21.7
Approach		591	2.0	0.543	9.9	LOS A	3.8	95.6	0.62	0.49	21.9
West: Foster Ave											
5	L2	51	2.0	0.199	7.4	LOS A	0.8	21.1	0.63	0.63	22.3
2	T1	38	2.0	0.199	7.4	LOS A	0.8	21.1	0.63	0.63	22.4
12	R2	51	2.0	0.199	7.4	LOS A	0.8	21.1	0.63	0.63	22.1
Approach		140	2.0	0.199	7.4	LOS A	0.8	21.1	0.63	0.63	22.3
All Vehicles		1736	2.0	0.584	10.0	LOS B	4.4	112.5	0.64	0.55	21.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Intersection 3-4 AM Future + All Projects

5-Leg Roundabout with northbound right-turn slip lane

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: NB LK Wood Blvd											
3ax	L1	112	2.0	0.328	7.8	LOS A	1.6	40.5	0.61	0.58	31.9
8x	T1	27	2.0	0.328	7.8	LOS A	1.6	40.5	0.61	0.58	32.3
18x	R2	146	2.0	0.328	7.8	LOS A	1.6	40.5	0.61	0.58	31.6
Approach		285	2.0	0.328	7.8	LOS A	1.6	40.5	0.61	0.58	31.8
NorthEast: SB LK Wood Blvd											
1x	L2	320	2.0	0.674	14.7	LOS B	6.3	158.8	0.81	0.86	29.0
16ax	R1	250	2.0	0.674	14.7	LOS B	6.3	158.8	0.81	0.86	28.9
16x	R2	63	2.0	0.674	14.7	LOS B	6.3	158.8	0.81	0.86	28.5
Approach		633	2.0	0.674	14.7	LOS B	6.3	158.8	0.81	0.86	28.9
West: EB Sunset Ave											
5b	L3	143	2.0	0.739	16.5	LOS C	8.5	216.5	0.86	0.86	28.8
5a	L1	168	2.0	0.739	16.5	LOS C	8.5	216.5	0.86	0.86	28.3
12a	R1	442	2.0	0.739	16.5	LOS C	8.5	216.5	0.86	0.86	28.5
Approach		753	2.0	0.739	16.5	LOS C	8.5	216.5	0.86	0.86	28.5
SouthWest: NB US 101 Off											
5bx	L3	116	2.0	0.349	13.4	LOS B	1.5	37.8	0.75	0.79	29.1
5x	L2	1	2.0	0.349	13.4	LOS B	1.5	37.8	0.75	0.79	28.9
2x	T1	48	2.0	0.349	13.4	LOS B	1.5	37.8	0.75	0.79	29.0
12x	R2	113	2.0	0.174	7.6	LOS A	0.7	17.8	0.64	0.64	32.3
Approach		278	2.0	0.349	11.0	LOS B	1.5	37.8	0.71	0.73	30.3
All Vehicles		1949	2.0	0.739	13.9	LOS B	8.5	216.5	0.79	0.80	29.3

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Alliance Rd/Foster Ave - AM Future + All Projects

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Alliance Rd											
3	L2	4	2.0	0.447	7.9	LOS A	2.8	72.0	0.50	0.35	22.5
8	T1	328	2.0	0.447	7.9	LOS A	2.8	72.0	0.50	0.35	22.5
18	R2	183	2.0	0.447	7.9	LOS A	2.8	72.0	0.50	0.35	22.2
Approach		515	2.0	0.447	7.9	LOS A	2.8	72.0	0.50	0.35	22.4
East: Foster Ave											
1	L2	272	2.0	0.381	7.7	LOS A	2.1	52.3	0.57	0.48	22.1
6	T1	7	2.0	0.381	7.7	LOS A	2.1	52.3	0.57	0.48	22.1
16	R2	101	2.0	0.381	7.7	LOS A	2.1	52.3	0.57	0.48	21.9
Approach		380	2.0	0.381	7.7	LOS A	2.1	52.3	0.57	0.48	22.0
North: Alliance Rd											
7	L2	175	2.0	0.593	11.7	LOS B	4.3	108.8	0.66	0.58	21.5
4	T1	412	2.0	0.593	11.7	LOS B	4.3	108.8	0.66	0.58	21.5
14	R2	4	2.0	0.593	11.7	LOS B	4.3	108.8	0.66	0.58	21.3
Approach		591	2.0	0.593	11.7	LOS B	4.3	108.8	0.66	0.58	21.5
West: Foster Ave											
5	L2	7	2.0	0.056	6.8	LOS A	0.2	5.3	0.63	0.60	22.6
2	T1	15	2.0	0.056	6.8	LOS A	0.2	5.3	0.63	0.60	22.6
12	R2	11	2.0	0.056	6.8	LOS A	0.2	5.3	0.63	0.60	22.4
Approach		33	2.0	0.056	6.8	LOS A	0.2	5.3	0.63	0.60	22.5
All Vehicles		1519	2.0	0.593	9.3	LOS A	4.3	108.8	0.58	0.48	22.0

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Alliance Rd/Foster Ave - AM Future + All Projects w Foster Ave Connection

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Alliance Rd											
3	L2	31	2.0	0.433	8.1	LOS A	2.6	64.9	0.56	0.45	22.4
8	T1	275	2.0	0.433	8.1	LOS A	2.6	64.9	0.56	0.45	22.4
18	R2	153	2.0	0.433	8.1	LOS A	2.6	64.9	0.56	0.45	22.1
Approach		459	2.0	0.433	8.1	LOS A	2.6	64.9	0.56	0.45	22.3
East: Foster Ave											
1	L2	233	2.0	0.392	8.0	LOS A	2.1	53.6	0.59	0.52	22.1
6	T1	46	2.0	0.392	8.0	LOS A	2.1	53.6	0.59	0.52	22.1
16	R2	101	2.0	0.392	8.0	LOS A	2.1	53.6	0.59	0.52	21.9
Approach		380	2.0	0.392	8.0	LOS A	2.1	53.6	0.59	0.52	22.0
North: Alliance Rd											
7	L2	175	2.0	0.609	12.4	LOS B	4.6	116.7	0.69	0.64	21.4
4	T1	354	2.0	0.609	12.4	LOS B	4.6	116.7	0.69	0.64	21.4
14	R2	63	2.0	0.609	12.4	LOS B	4.6	116.7	0.69	0.64	21.2
Approach		592	2.0	0.609	12.4	LOS B	4.6	116.7	0.69	0.64	21.4
West: Foster Ave											
5	L2	60	2.0	0.244	8.6	LOS A	1.0	25.8	0.67	0.67	22.1
2	T1	44	2.0	0.244	8.6	LOS A	1.0	25.8	0.67	0.67	22.1
12	R2	54	2.0	0.244	8.6	LOS A	1.0	25.8	0.67	0.67	21.9
Approach		158	2.0	0.244	8.6	LOS A	1.0	25.8	0.67	0.67	22.0
All Vehicles		1589	2.0	0.609	9.7	LOS A	4.6	116.7	0.63	0.56	21.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Intersection 3-4 PM Future + All Projects

5-Leg Roundabout with northbound right-turn slip lane

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
SouthEast: NB LK Wood Blvd											
3ax	L1	238	2.0	1.079	83.6	LOS F	32.1	816.4	1.00	2.35	15.4
8x	T1	171	2.0	1.079	83.6	LOS F	32.1	816.4	1.00	2.35	15.5
18x	R2	282	2.0	1.079	83.6	LOS F	32.1	816.4	1.00	2.35	15.3
Approach		691	2.0	1.079	83.6	LOS F	32.1	816.4	1.00	2.35	15.4
NorthEast: SB LK Wood Blvd											
1x	L2	269	2.0	0.894	38.1	LOS E	11.9	301.6	1.00	1.42	22.4
16ax	R1	181	2.0	0.894	38.1	LOS E	11.9	301.6	1.00	1.42	22.3
16x	R2	151	2.0	0.894	38.1	LOS E	11.9	301.6	1.00	1.42	22.1
Approach		601	2.0	0.894	38.1	LOS E	11.9	301.6	1.00	1.42	22.3
West: EB Sunset Ave											
5b	L3	172	2.0	0.478	8.8	LOS A	3.0	76.1	0.59	0.46	31.2
5a	L1	201	2.0	0.478	8.8	LOS A	3.0	76.1	0.59	0.46	30.8
12a	R1	140	2.0	0.478	8.8	LOS A	3.0	76.1	0.59	0.46	30.9
Approach		513	2.0	0.478	8.8	LOS A	3.0	76.1	0.59	0.46	31.0
SouthWest: NB US 101 Off											
5bx	L3	175	2.0	0.632	18.0	LOS C	4.3	109.1	0.83	0.96	28.0
5x	L2	1	2.0	0.632	18.0	LOS C	4.3	109.1	0.83	0.96	27.8
2x	T1	226	2.0	0.632	18.0	LOS C	4.3	109.1	0.83	0.96	27.9
12x	R2	127	2.0	0.137	5.2	LOS A	0.6	15.0	0.51	0.41	33.5
Approach		529	2.0	0.632	15.0	LOS B	4.3	109.1	0.75	0.83	29.1
All Vehicles		2334	2.0	1.079	39.9	LOS E	32.1	816.4	0.85	1.35	21.9

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Alliance Rd/Foster Ave - PM Future + All Projects

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Alliance Rd											
3	L2	18	2.0	0.602	10.6	LOS B	4.8	121.9	0.60	0.43	21.9
8	T1	503	2.0	0.602	10.6	LOS B	4.8	121.9	0.60	0.43	21.9
18	R2	182	2.0	0.602	10.6	LOS B	4.8	121.9	0.60	0.43	21.6
Approach		703	2.0	0.602	10.6	LOS B	4.8	121.9	0.60	0.43	21.8
East: Foster Ave											
1	L2	184	2.0	0.484	10.8	LOS B	2.9	74.1	0.71	0.77	21.5
6	T1	27	2.0	0.484	10.8	LOS B	2.9	74.1	0.71	0.77	21.6
16	R2	187	2.0	0.484	10.8	LOS B	2.9	74.1	0.71	0.77	21.3
Approach		398	2.0	0.484	10.8	LOS B	2.9	74.1	0.71	0.77	21.4
North: Alliance Rd											
7	L2	155	2.0	0.554	9.9	LOS A	3.9	100.2	0.61	0.46	21.9
4	T1	456	2.0	0.554	9.9	LOS A	3.9	100.2	0.61	0.46	21.9
14	R2	8	2.0	0.554	9.9	LOS A	3.9	100.2	0.61	0.46	21.7
Approach		619	2.0	0.554	9.9	LOS A	3.9	100.2	0.61	0.46	21.9
West: Foster Ave											
5	L2	7	2.0	0.072	6.6	LOS A	0.3	7.0	0.62	0.59	22.7
2	T1	22	2.0	0.072	6.6	LOS A	0.3	7.0	0.62	0.59	22.7
12	R2	16	2.0	0.072	6.6	LOS A	0.3	7.0	0.62	0.59	22.4
Approach		45	2.0	0.072	6.6	LOS A	0.3	7.0	0.62	0.59	22.6
All Vehicles		1765	2.0	0.602	10.3	LOS B	4.8	121.9	0.63	0.52	21.8

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: Alliance Rd/Foster Ave - PM Future + All Projects w Foster Ave Connection

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Alliance Rd											
3	L2	68	2.0	0.631	11.9	LOS B	5.5	139.6	0.69	0.58	21.6
8	T1	459	2.0	0.631	11.9	LOS B	5.5	139.6	0.69	0.58	21.6
18	R2	165	2.0	0.631	11.9	LOS B	5.5	139.6	0.69	0.58	21.3
Approach		692	2.0	0.631	11.9	LOS B	5.5	139.6	0.69	0.58	21.5
East: Foster Ave											
1	L2	165	2.0	0.509	11.8	LOS B	3.1	79.9	0.74	0.82	21.3
6	T1	46	2.0	0.509	11.8	LOS B	3.1	79.9	0.74	0.82	21.4
16	R2	187	2.0	0.509	11.8	LOS B	3.1	79.9	0.74	0.82	21.1
Approach		398	2.0	0.509	11.8	LOS B	3.1	79.9	0.74	0.82	21.3
North: Alliance Rd											
7	L2	155	2.0	0.584	11.0	LOS B	4.6	115.6	0.67	0.58	21.7
4	T1	417	2.0	0.584	11.0	LOS B	4.6	115.6	0.67	0.58	21.7
14	R2	47	2.0	0.584	11.0	LOS B	4.6	115.6	0.67	0.58	21.5
Approach		619	2.0	0.584	11.0	LOS B	4.6	115.6	0.67	0.58	21.7
West: Foster Ave											
5	L2	51	2.0	0.211	7.9	LOS A	0.9	22.1	0.65	0.65	22.2
2	T1	38	2.0	0.211	7.9	LOS A	0.9	22.1	0.65	0.65	22.3
12	R2	51	2.0	0.211	7.9	LOS A	0.9	22.1	0.65	0.65	22.0
Approach		140	2.0	0.211	7.9	LOS A	0.9	22.1	0.65	0.65	22.2
All Vehicles		1849	2.0	0.631	11.3	LOS B	5.5	139.6	0.69	0.64	21.6

Level of Service (LOS) Method: Delay & v/c (HCM 2010).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 2010).
Roundabout Capacity Model: US HCM 2010.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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APPENDIX T.1

Appendix E

Proportional Share Calculations

APPENDIX T.1

	Improvement Projects	Total Cost of Improvements	Proportional Share	Money Funded
	Short-term			
1	Sunset Ave/LK Wood Blvd Re-Striping	$ 98,890	100%	$ 98,890
2a	Re-Stripe Alliance Road Approaches	$ 6,400	100%	$ 6,400
2b	*Re-Stripe Alliance & Foster Approaches- Foster Connection*	*$ 8,800*	*100%*	*$ 8,800*
	Future			
3	LK Wood Blvd/Sunset Ave- Roundabout	$ 3,195,000	15%	$ 479,250
4a	Foster Ave/Alliance Rd- Roundabout	$ 325,000	100%	$ 325,000
4b	*Foster Ave/Alliance Rd- Roundabout- Foster Connection*	*$ 325,000*	*100%*	*$ 325,000*
		$ 3,625,290	Total	$ 909,540
	With Foster Connection	$ 3,627,690	With Foster Connection	$ 911,940

1	**Sunset Ave/LK Wood Blvd Re-Striping**		**Short-term**	**$ 98,890**
	Proposed Development Project	PM Trips	Proportional Share	Resulting Fee
	The Village	128	52.2%	$ 51,665
	Canyon Creek	27	11.0%	$ 10,898
	Open Door	44	18.0%	$ 17,760
	Sunset Terrace	23	9.4%	$ 9,284
	Twin Parks	14	5.7%	$ 5,651
	Creekside	9	3.7%	$ 3,633
		245	100%	$ 98,891

2a	**Re-Stripe Alliance Road Approaches**		**Short-term**	**$ 6,400**
	Proposed Development Project	PM Trips	Proportional Share	Resulting Fee
	The Village	23	15.5%	$ 995
	Canyon Creek	15	10.1%	$ 649
	Open Door	19	12.8%	$ 822
	Sunset Terrace	44	29.7%	$ 1,903
	Twin Parks	8	5.4%	$ 346
	Creekside	39	26.4%	$ 1,686
		148	100%	$ 6,401

2b	**Re-Stripe Alliance & Foster Approaches- Foster Connection**		**Short-term**	**$ 8,800**
	Proposed Development Project	PM Trips	Proportional Share	Resulting Fee
	The Village	23	10.6%	$ 937
	Canyon Creek	15	6.9%	$ 611
	Open Door	19	8.8%	$ 774
	Sunset Terrace	44	20.4%	$ 1,793
	Twin Parks	8	3.7%	$ 326
	Creekside	107	49.5%	$ 4,359
		216	100%	$ 8,800

3	**LK Wood Blvd/Sunset Ave- Roundabout**		**Future**	**$ 479,250**
	Proposed Development Project	PM Trips	Proportional Share	Resulting Fee
	The Village	128	52.2%	$ 250,384
	Canyon Creek	27	11.0%	$ 52,815
	Open Door	44	18.0%	$ 86,069
	Sunset Terrace	23	9.4%	$ 44,991
	Twin Parks	14	5.7%	$ 27,386
	Creekside	9	3.7%	$ 17,605
		245	100%	$ 479,250

4a	**Foster Ave/Alliance Rd- Roundabout**		**Future**	**$ 325,000**
	Proposed Development Project	PM Trips	Proportional Share	Resulting Fee
	The Village	23	15.5%	$ 50,507
	Canyon Creek	15	10.1%	$ 32,939
	Open Door	19	12.8%	$ 41,723
	Sunset Terrace	44	29.7%	$ 96,622
	Twin Parks	8	5.4%	$ 17,568
	Creekside	39	26.4%	$ 85,642
		148	100%	$ 325,001

4b	**Foster Ave/Alliance Rd- Roundabout- Foster Connection**		**Future**	**$ 325,000**
	Proposed Development Project	PM Trips	Proportional Share	Resulting Fee
	The Village	23	10.6%	$ 34,606
	Canyon Creek	15	6.9%	$ 22,569
	Open Door	19	8.8%	$ 28,588
	Sunset Terrace	44	20.4%	$ 66,204
	Twin Parks	8	3.7%	$ 12,037
	Creekside	107	49.5%	$ 160,995
		216	100%	$ 324,999

Summary Table by Proposed Development Project	
The Village	$ 353,551
Canyon Creek	$ 97,301
Open Door	$ 146,374
Sunset Terrace	$ 152,800
Twin Parks	$ 50,951
Creekside	$ 108,566
Total	$ 909,543

Summary Table by Proposed Development Project (with Foster Connection)	
The Village	$ 337,592
Canyon Creek	$ 86,893
Open Door	$ 133,191
Sunset Terrace	$ 122,272
Twin Parks	$ 45,400
Creekside	$ 186,592
Total	$ 911,940

City of Arcata

Traffic Impact Mitigation Fee

Project Estimate

Sunset Ave/LK Wood Blvd Re-Striping

Project Location

Project Description

The project would install raised medians to separate vehicles from the pedestrian and bicycle facilities. The existing channelized right-turn lane for vehicles would be converted to bicycle right turns only. Eastbound right turns would instead be made at the stop-controlled intersection. Some length of green bike lane, including a bike box on the northbound approach, would be installed.

Project Estimate

Construction	$	42,860
Signing Striping	$	4,500
Traffic Control	$	7,200
Subtotal	*$*	*54,560*
Design (30%)	$	16,368
Inspection (15%)	$	8,184
Contingency (25%)	$	19,778
Total	**$**	**98,890**
Percent in Fee		**100%**

Amount and Breakdown Included in Fee

Project	Trips	Cost
The Village	128	$ 51,665
Canyon Creek	27	$ 10,898
Open Door	44	$ 17,760
Sunset Terrace	23	$ 9,284
Twin Parks	14	$ 5,651
Creekside	9	$ 3,633
Total	**245**	**$ 98,891**

City of Arcata

Traffic Impact Mitigation Fee

Project Estimate

Re-Stripe Alliance Road Approaches

Project Location

Project Description

The project would restripe the north and south legs The northbound approach would have a left-turn and through/right-turn lane while the southbound approach would have a through/left-turn lane and a right-turn lane.

Project Estimate

Striping Removal	$	1,400
Striping Installation	$	2,600
Traffic Control	$	2,400
Total	**$**	**6,400**
Percent in Fee		**100%**

Amount and Breakdown Included in Fee

Project	Trips	Cost
The Village	23	$ 995
Canyon Creek	15	$ 649
Open Door	19	$ 822
Sunset Terrace	44	$ 1,903
Twin Parks	8	$ 346
Creekside	39	$ 1,686
Total	**148**	**$ 6,401**

City of Arcata

Traffic Impact Mitigation Fee

Project Estimate

Re-Stripe Alliance & Foster Approaches- Foster Connection

Project Location

Project Description

The project would restripe the north, south, and west legs. The northbound approach would have left-turn and through/right-turn lanes. The southbound approach would have a through/left-turn lane and a right-turn lane. The westbound approach would include left-turn and through/right-turn lanes.

Project Estimate

Striping Removal	$ 1,500
Striping Installation	$ 3,700
Traffic Control	$ 3,600
Total	**$ 8,800**
Percent in Fee	**100%**

Amount and Breakdown Included in Fee

Project	Trips	Cost
The Village	23	$ 937
Canyon Creek	15	$ 611
Open Door	19	$ 774
Sunset Terrace	44	$ 1,793
Twin Parks	8	$ 326
Creekside	107	$ 4,359
Total	**216**	**$ 8,800**

City of Arcata

Traffic Impact Mitigation Fee

Project Estimate

LK Wood Blvd/Sunset Ave- Roundabout

Project Location

Project Description

The project would be the installation of a one-lane, 160-foot driameter, moden roundabout to convert the two intersections of Sunset Avenue/US 101 North Ramps and Sunset Avenue/LK Wood Boulevard, into a single one As proposed, there would be a slip right-turn lane for the 101 North off-ramp. The project would include improved and separated pedestrian and bicycle facilities.

Project Estimate

Roundabout*	$	2,048,000
Ramp Configuration	$	409,600
Design (30%)	$	737,280
Total	**$**	**3,195,000**
Percent in Fee		**15%**

Amount and Breakdown Included in Fee

Project	Trips	Cost
The Village	128	$ 250,384
Canyon Creek	27	$ 52,815
Open Door	44	$ 86,069
Sunset Terrace	23	$ 44,991
Twin Parks	14	$ 27,386
Creekside	9	$ 17,605
Total	**245**	**$ 479,250**

* Cost Estiamte from the *National Cooperative Highway Reseach Program* (NCHRP) average cost for a multi-lane roundabout

APPENDIX T.1

City of Arcata

Traffic Impact Mitigation Fee

Project Estimate

Foster Ave/Alliance Rd- Roundabout

Project Location

Project Description

The project would include the installation of a mini elliptical rounabout at Foster Avenue/Alliance Road. The mini-roundabout would have a diameter of 56 to 62 feet.

Project Estimate

Mini Roundabout*	250000
Design (30%)	75000
Total	**325000**
Percent in Fee	**100%**

Amount and Breakdown Included in Fee

Project	Trips	Cost
The Village	23	$ 50,507
Canyon Creek	15	$ 32,939
Open Door	19	$ 41,723
Sunset Terrace	44	$ 96,622
Twin Parks	8	$ 17,568
Creekside	39	$ 85,642
Total	**148**	**$ 325,001**

* Cost Estiamte from the *National Cooperative Highway Reseach Program* (NCHRP) average cost for a mini roundabout

City of Arcata

Traffic Impact Mitigation Fee

Project Estimate

Foster Ave/Alliance Rd- Roundabout

Project Location

Project Description

The project would include the installation of a mini elliptical rounabout with a diameter between 56 and 62 feet.

Project Estimate

Mini Roundabout*	250000
Design (30%)	75000
Total	**325000**
Percent in Fee	**100%**

Amount and Breakdown Included in Fee

Project	Trips	Cost
The Village	23	$ 34,606
Canyon Creek	15	$ 22,569
Open Door	19	$ 28,588
Sunset Terrace	44	$ 66,204
Twin Parks	8	$ 12,037
Creekside	107	$ 160,995
Total	**216**	**$ 324,999**

* Cost Estiamte from the *National Cooperative Highway Reseach Program* (NCHRP) average cost for a mini roundabout

APPENDIX T.2

October 31, 2018

Mr. David Loya
City of Arcata
736 F Street
Arcata, CA 95521

Response to Comments on the *Central Arcata Areawide Traffic Impact Study*

Dear Mr. Loya;

As requested, we have prepared the following responses to comments on the *Central Arcata Areawide Traffic Impact Study* dated March 13, 2017 prepared for the City of Arcata. The comments are contained in a letter to Mr. Howard Wilkins III from Neal K. Liddicoat dated July 17, 2018 and summarized in a letter to the City Councilmembers from Mr. Wilkins dated July 17, 2018. For ease of reference, the comments from Mr. Liddicoat are paraphrased (shown in *italics*), and the page and paragraph of the text being referenced indicated. Note that the "Summary of Findings" section of Mr. Liddicoat's letter is not addressed as the specific issues are address in more detail in the following sections of the letter.

1. Intersection Level of Service Results

   The Highway Capacity Manual states that LOS is not defined for the intersection as a whole for two-way stop-controlled intersections and one of the reasons for this is that the average of delay for all movements may mask important LOS deficiencies for minor movements.

While the standard applied references the overall delay at two-way stop-controlled intersections, the delay on the minor stop-controlled approach is provided in the summary tables. It is noted in the comment that delay should have been indicated by individual movement; however, except for the US 101 North off-ramp approach to Sunset Avenue, all of the stop-controlled approaches have only a single lane or have such a short second lane that they were conservatively evaluated as a single lane. Application of a service level standard to a single movement is typically considered undesirable as it places too much emphasis on a minority of the drivers entering that intersection. In the case of Sunset Avenue/US 101 North Ramps, for instance, if the LOS D or worse operation for the northbound left-turn movement were used as the basis for determining unacceptable operation, as suggested in the comment letter, the intersection would need to be improved to reduce delay to 7 percent of the drivers entering during the morning peak hour and less than 9 percent during the p.m. peak hour. This does not appear to be a reasonable approach as it serves such a small percentage of the traveling public.

Under the standard applied, LOS D or worse operation was considered acceptable if overall operation remained at LOS C or better. It is noted that LOS C is a higher standard than is applied in most communities; LOS D is more typically the adopted minimum. Further, where side-street delay is addressed in agency standards, the adopted minimum is generally one to two letters lower than the minimum for overall operation. Application of an LOS C standard to the stop-controlled approaches would result in a maximum acceptable delay of 25 seconds, a level that is well below the limit of what is considered tolerable by most drivers.

It should also be noted that this intersection is controlled by Caltrans, and their guidelines indicate that they endeavor to maintain operation at the transition from LOS C to LOS D. Based on information recently provided by Caltrans District 1 staff, it is understood that the standard is generally to be applied to the overall average intersection delay, as was done in the EIR, and not that associated with any single movement or approach. Caltrans

staff indicated that for individual movements, LOS can be used as a comparative metric, but operation at LOS D or worse *would not be unacceptable in and of itself*. Caltrans staff indicated that they are more concerned with some of the components that are part of LOS (delay, queuing, capacity, percent time following, etc.), especially insofar as to how these factors might directly impact operation, and thus safety, of an intersection or highway segment. Rather than looking at the service level, the concern would be whether high delay is causing excessive queuing to back-up and interfere with the predominant ("mainline") traffic flow or is causing unsafe behavior such as drivers impatiently pulling out into insufficient gaps. Caltrans staff is more likely to request direct mitigation to address a concrete impact that can be foreseen because of the additional, or changed, traffic from a development (rather than basing the request on a drop in overall LOS). Under this approach, if one movement experiences very high delay and has moderate to high traffic volumes, other factors such as queuing or safety implications the overall delay and level of service should reflect the critical nature of the condition. However, if one movement is expected to experience high delay, but has very low traffic volumes, the overall intersection operation will likely still meet Caltrans standards.

Despite direction from Caltrans staff and application of a reasonable expectation relative to the delay that drivers will accept, if the LOS C standard were applied, the project would have a significant impact at Sunset Avenue/US 101 North Ramps during the p.m. peak hour. However, this change in service level from LOS C to LOS D would occur during both peak hours with the Canyon Creek, Open Door Health Center, Twin Parks or Creekside projects, and operation on the stop-controlled approach would deteriorate to LOS E during the p.m. peak hour with the Sunset Terrace project. Clearly this intersection will experience deterioration on the stop-controlled approach to LOS D or worse when any one of the six projects studied is occupied. Further, the Village project has the least impact on this intersection of any of the six projects studied, adding only 2.3 seconds to the average delay. Given this additional information, it is reasonable to conclude that the project's impact relative to "Existing plus Project" conditions is less-than-significant, as indicated in the EIR.

Under "Future plus The Village" conditions the delay to the side streets is sufficient to trigger need for improvements without or with the Village project. There are no locations where side streets were found to operate at LOS D or worse but overall operation remained acceptable, and improvements were identified to address these impacts. It is irrelevant whether the delay reported is for the intersection overall or for individual movements, as suggested in the letter. In terms of the impact, the results are the same – improvements are needed, recommendations were identified, and the applicants for each of the six projects are to be conditioned to contribute funds toward these recommended improvements.

Finally, we differ with the assertion that long-established and generally-accepted methodologies were incorrectly applied. We have used these same assumptions in traffic analyses and EIRs prepared for projects in nearly all the jurisdictions in the Bay Area and north to Del Norte County as well as south to San Luis Obispo County, and they have been accepted and adopted. The use of delay by movement is not a generally-accepted metric.

2. Peak Hour Factor

   A floor value of 0.90 was applied as the Peak Hour Factor (PHF) rather than the actual values that reflect volumes during the peak 15 minutes. As a result, the delays reported are lower than those experienced during the peak 15 minutes.

The actual peak hour factors were reviewed to determine the extent to which the use of the minimum value of 0.90 may have affected the analysis. The actual and applied peak hour factors for all seven study intersections are shown in Table 1.

APPENDIX T.2

Table 1 – Peak Hour Factor Summary

Intersection	AM Peak Hour		PM Peak Hour	
	Actual	Applied	Actual	Applied
1. St. Louis Rd/US 101 Overpass	0.914	same	0.934	same
2. LK Wood Blvd/US 101 Overpass	0.960	same	0.955	same
3. Sunset Ave/LK Wood Blvd	0.797	0.900	0.930	same
4. Sunset Ave/US 101N Ramps	0.870	0.900	0.949	same
5. Sunset Ave/US 101S Ramps-G&H St	0.916	same	0.961	same
6. Sunset Ave/Foster Ave-Jay St	0.700	0.900	0.971	same
7. Foster Ave/Alliance Rd	0.861	0.900	0.918	same

The concern that use of an unreasonably high peak hour factor may have contributed to the lack of finding that the project had a significant impact at Sunset Avenue/US 101 North Ramps was specifically reviewed. As shown in Table 1, the actual PHF was measured at 0.870, so not substantially lower than the 0.90 applied. It is further noted that application of a very low peak hour factor, such as the 0.67 cited in the letter, artificially inflates the volume to reflect the highest 15-minute period, resulting in the need for capacity to accommodate the traffic that occurs for only 15 minutes out of the hour. This type of over-design is generally to be avoided as it results in excessive costs to accommodate short-term inconvenience. It is further noted that improvements that increase capacity can have a negative impact on VMT, so use of the higher PHF provides results that are reasonable under the current LOS standards but that is also sensitive to VMT.

The location with the lowest PHF for either peak hour was Sunset Avenue/Foster Avenue-Jay Street. While the use of the "floor" value of 0.90 results in less delay than would be experienced during the highest-volume 15 minutes, since this location operates at LOS A under all scenarios it is reasonable to anticipate that operation would remain at LOS C or better regardless of the peak hour factor used. Similarly, Sunset Avenue/LK Wood Boulevard, which had the "floor" PHF applied in estimating acceptable delay, showed acceptable delay using the actual peak hour factor for the evening peak hour, and would not change substantially if the actual PHF were applied. Finally, Foster Avenue/Alliance Road was found to need improvements to address operation during the evening peak hour, so use of the actual peak hour factor would not have changed the findings or recommendations.

Use of a PHF of 1.0 for future conditions was previously addressed, but it should be noted that future volumes are a projection and not counted data. These values are typically already conservative, so realistically reflect what volumes could be with a PHF applied. It is common practice to use 1.0 as the PHF for future analyses in many jurisdictions.

3. Pedestrian and Bicycle Impacts

The wording in the report is misrepresented in the comment; the report in fact reads, "Impacts relative to access for pedestrians, bicyclists, and to transit are also addressed." It does not say that delays for pedestrians were considered. Absent specific policies relative to delay experienced by pedestrians and bicyclists, delay values for these alternative modes were not assessed. Rather, a qualitative assessment of the adequacy of connectivity was performed to ensure that pedestrians, bicyclists and transit riders would be able to use their mode of choice in a reasonable way.

The statement that pedestrians generated by proposed projects were not added as part of the future volumes is true, but it is also true that it would not have changed any results if the pedestrians were included. The only methodology that accounts for pedestrian crossings is the signalized methodology, and none of the study

intersections are signalized. While the pedestrian volumes were input to the analysis software, through work on a subsequent project where pedestrian traffic was an issue, this methodological limitation was brought to light. Therefore, due to the limitations of the software, even had pedestrian volumes been added along with vehicle trips from the proposed projects, the results would have been identical to those presented.

It is further noted that the needs of pedestrians and bicyclists were placed above those of drivers; while improvements were identified that would reduce delays at the intersection of Sunset Avenue/LK Wood Boulevard in the short-term until the longer-term improvements can be made, because of the associated increase in conflict with pedestrian and bicycle traffic, the addition of travel lanes was not recommended.

4. Future year Traffic Forecasts

Caltrans' projected 20-year growth rate for the portion of US 101 through Arcata is 1.25. The rate applied of 1.5 percent per year for 20 years translates to a growth rate of 1.35. Some of this growth would reasonably be attributed to the six projects included in the study, though it was conservatively analyzed as if the projects were added to the future volumes derived from the 1.35 growth rate. If the Caltrans projected growth rate of 1.25 is experienced, assuming this includes the six projects, the volumes would be substantially lower than those used in the analysis, as indicated.

5. Level of Service Standard

As noted above, the exception to the LOS C standard was applied at Sunset Avenue/LK Wood Boulevard because this intersection is under the jurisdiction of the University, and feedback was received that the University was averse to the suggestion that an additional lane be provided because of the negative impact on pedestrian and bicycle traffic. The exception was not applied at any other locations, though it is noted that the LOS D standard was extended to the intersection of Sunset Avenue/US 101 North under Future Conditions where the roundabout would encompass both intersections.

6. Deficient Pedestrian and Bicycle Mitigation

While completion of the trail connecting The Village site to Sunset Avenue is important and would provide a more direct connection, it is not the only route for pedestrians or bicyclists. Active mode trips do not need to be made on St. Louis Road; a connection to Eye Street would provide pedestrians and bicyclists a route along low-volume, low-speed roadways to connect to the existing portion of the pathway south of Sunset Avenue or to facilities on Sunset Avenue connecting to the University. The impact is therefore less-than-significant, as stated.

7. Vehicle-Miles Traveled (VMT) Analysis

The comment as stated indicates a misunderstanding of the VMT concept by implying that any increase in VMT translates to a significant impact. The General Plan policy as written was no doubt intended to decrease the VMT *per capita* as stated in the W&S memo, rather than the overall VMT for the city. A policy that capped VMT at the current level, with no provisions for additional travel associated with future development, could be interpreted as inverse condemnation as it would eliminate the potential for new development anywhere in the City unless offset by a reduction of existing travel. The City's General Plan also contains guidance on what types of land uses are anticipated on currently vacant parcels, clearly indicating that increased development is planned, including on the project parcel.

One of the purposes of evaluating VMT is to provide agencies with a metric for establishing location efficiencies between housing and jobs, or in this case, between housing and school. Constructing new housing near a college or university reduces the need for students to travel many miles between their residence and campus, thereby decreasing the VMT for those trips. Where access by walking or riding a bicycle is feasible, the VMT drops even

further. By reducing reliance on single-occupant automobiles and increasing use of active modes, this project can reasonably be expected to have a net positive impact on regional per capita VMT.

The table included in the comment letter identifies reduced average trip lengths for the community overall during both the morning and evening peak hours. If even half the residents of Arcata generate one trip during each during of the two peak periods, this would translate to a reduction in the VMT of 0.07 miles. While this is a small number, it is noted that this is the average for the entire city, and presumably the current residents and employees will not all change their travel patterns, so the trip length for the project trips must be substantially below the current average to cause such a shift. It is indicative of the net positive impact these projects would have by placing housing and services near jobs and patrons.

We hope these comments are helpful in addressing the concerns stated in Mr. Liddicoat's letter. Thank you for giving us the opportunity to provide these services.

Sincerely,

Dalene J. Whitlock, PE, PTOE
Principal

DJW/djw/ARC014-1.L1

W & S Solutions, LLC
Transportation Consulting Service

Date:	June 22, 2016
To:	Dalene J. Whitlock, Principal, PE, PTOE, W-Trans
From:	Jia Hao Wu, Yanping Zhang, Denis Wu, W & S Solutions, LLC.
Reference:	Technical Memorandum on VMT Procedure and Computations Draft
Subject:	A New CEQA Guidelines Based VMT Modeling for Six Project Sites in Arcata

Project Background

In this memorandum, W & S Solutions (W&S) discusses the new CEQA Guidelines based VMT modeling services for the project sites in Arcata study area using the 2013 Eureka County traffic model (called the Model). This model was provided by Caltrans District 1 in 2014 and is used to perform the VMT computations.

VMT Methodology

This modeling service is based on the new CEQA Guidelines on Evaluating Transportation Impacts regarding the VMT estimation dated on January 20, 2016. The Governor's Office of Planning and Research (OPR) is mandated by SB 743 in 2013 to revise the CEQA Guidelines to eliminate the use of Level of Service (LOS) in determining transportation impacts under CEQA. The second draft of the new CEQA Guidelines to implement SB 743 is released for public comment on January 20, 2016. OPR's draft continues to use vehicle miles travelled (VMT) as the appropriate measure of transportation impacts. In addition, the draft Guidelines include recommendations that land use development proposed near transit facilities, roadway rehabilitation, transit, bicycle, and pedestrian projects should be considered to have decreased significant transportation impacts. These fundamental changes in evaluating transportation impacts have created a significant amount of concern both in the development industry and the environmental consulting industry.

The basic assumptions include the use of the demand forecasting model, the road networks and land use data for 2010 and 2040:

1. The 2040 network assumptions are the same as the 2010 road network assumptions as in the Model;
2. The land use data in 2040 are different from the 2010 assumptions;
3. The OD vehicle demand patterns in the Model are used to estimate the new demands based on additional trips generated from and attracted to these six projects so that the trip patterns are consistent;
4. The new CEQA VMT thresholds are indicated as follows:
    a. Residential: VMT/capita 15% below regional average in 2010
    b. Office: VMT/employee 15% below regional average in 2010
    c. Mixed Use: Internal trips are reflected in the Model.

OPR states that for "Vehicle Miles Traveled and Land Use Projects", a development project that results in vehicle miles traveled exceeding these applicable thresholds of significance may indicate a significant impact. Generally, development projects that locate within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor may be presumed to cause a less than significant transportation impact. Similarly, development projects that decrease vehicle miles traveled in the project area compared to existing conditions may be considered to have a less than significant transportation impact. A lead agency may use models to estimate a project's vehicle miles traveled, and may revise those estimates to reflect professional judgment

Attachment: P. VMT Analysis Memo (1607 : The Village Student Housing Project)

based on substantial evidence. Any assumptions used to estimate vehicle miles traveled and any revisions to model outputs should be documented and explained in the environmental document prepared for the project.

To summarize, the new CEQA guideline asks to compute VMT per capita or per employee for new development. A per capita or per employee VMT 15% below that of existing development may be a reasonable threshold. Thus W&S needs to compute all the average VMT per trip with a trip representing either a capita or employee for 2010 and year 2040 for each of the development sites and the whole region and compare to the 2040 without project average VMT and the regional averages as well. It is noted that there are vehicle trips in 2040 without project condition at these three TAZs where these six project sites are located. Here is the methodology for the VMT computations and definitions for the total VMT and Average VMT used for each project and the whole region as follows.

1. Identify the study area in terms of TAZs and total trips generated (trips out) and attracted (trips in) in each TAZ
2. Find 2010 and 2040 vehicle OD demands and vehicle distances by AM and PM peak periods in the Model
3. Compute the 2010 and 2040 without project VMT:
    a. VMT_AM= Demand_AM*Distance_AM
    b. VMT_PM= Demand_PM*Distance_PM
4. Compute the 2010 and 2040 without project average VMT:
    a. Average VMT_AM=VMT_AM/Demand_AM
    b. Average VMT_PM=VMT_PM/Demand_PM
5. Compute the 2040 vehicle OD demands with each of these projects to obtain total additional trips in and out using Table 1: New OD Demand_AM and New OD Demand_PM using 2040 OD Demand_AM, TripsIn_AM, TripsOut_AM and 2040 OD Demand_PM, TripsIn_PM, TripsOut_PM
6. Compute the 2040 with project VMT:
    a. New VMT_AM= New Demand_AM*Distance_AM
    b. New VMT_PM= New Demand_PM*Distance_PM
7. Compute the 2040 average with project VMT:
    a. New Average VMT_AM=New VMT_AM/New Demand_AM
    b. New Average VMT_PM=New VMT_PM/New Demand_PM

Six New Development Projects

The six development projects are shown in Figure 1 and trips for daily, AM peak hour and PM peak hour listed in Table 1. These projects are located in:

1. The Village (Apartments)
2. Canyon Creek (Apartments)
3. Open Door (Medical Office)
4. Sunset Terrace (Apartments)
5. Twin Parks (Apartments)
6. Creekside (Single Family, Assisted Living)

Attachment: P. VMT Analysis Memo (1607 : The Village Student Housing Project)

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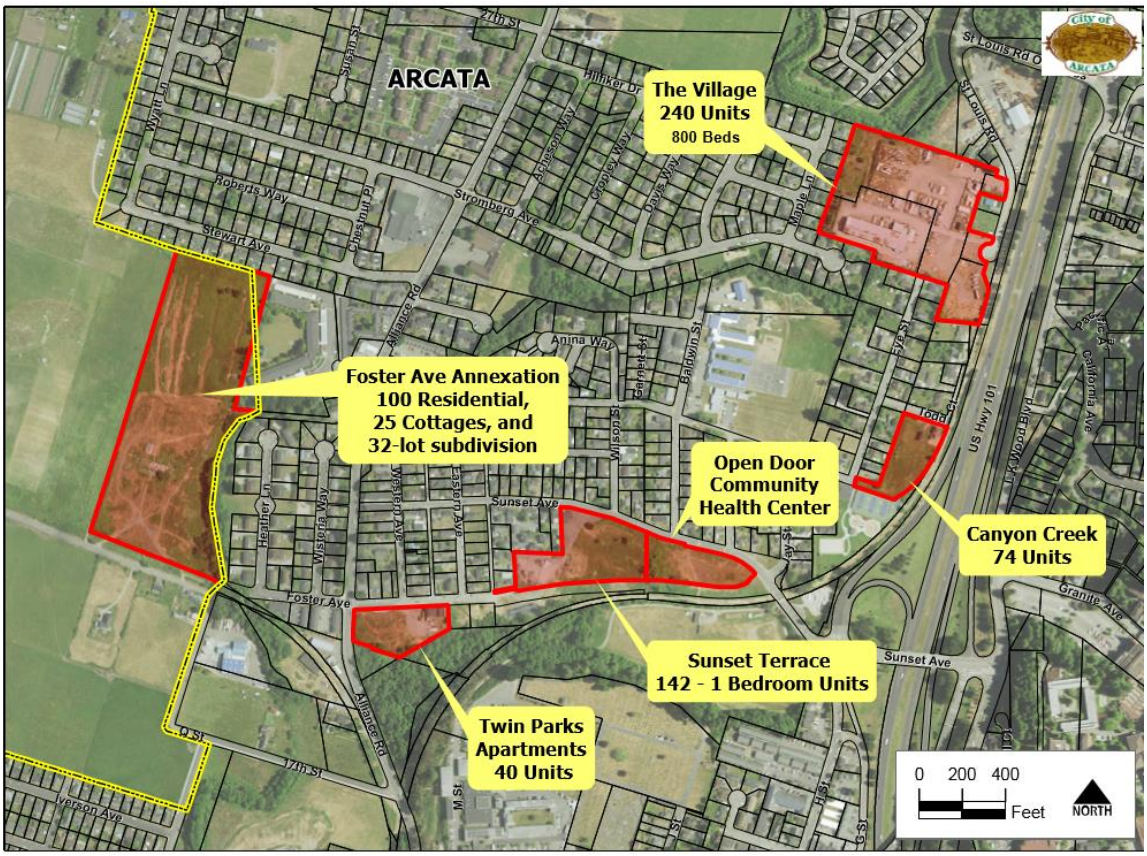

Figure 1: Study Area of 6 Projects with Land Use Data (Source: W-Trans)

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Table 1: Total Trips In and Out by Daily, AM Peak Hour and PM Peak Hour

Trip Generation Summary of Project Development

Land Use	Units	Daily		AM Peak Hour				PM Peak Hour			
		Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out
The Village											
Apartments	240 du	6.57	1,578	0.51	121	24	97	0.62	150	97	53
Canyon Creek											
Apartments	74 du	7.73	572	0.54	40	8	32	0.79	58	38	20
Open Door											
Medical Office	30 ksf	36.13	1,084	2.39	72	57	15	3.57	107	30	77
Sunset Terrace											
Apartments	142 du	6.93	984	0.52	73	15	58	0.67	96	62	34
Twin Parks											
Apartments	40 du	9.15	366	0.58	23	5	18	0.99	40	26	14
Creekside											
Single Family	89 du	9.52	847	0.75	67	17	50	1.00	89	56	33
Assisted Living	100 beds	2.66	266	0.14	14	9	5	0.22	22	10	12
Total			5,697		410	135	275		562	319	243

Note: du = dwelling unit; ksf = 1,000 square feet (Source: W-Trans)

These six project sites are all located in three TAZs (242, 247 and 235) in the modeling network as shown in Table 2.

Table 2: Six Project Locations and Their TAZ IDs

ID	Development Site	TAZ
1	The Village Apt	242
2	Canyon Creek Apt	242
3	Open Door Com Health Ctr	247
4	Sunset Terrace Apt	247
5	Twin Park Apt	247
6	Creekside	235

VMT Computation Results

Based on the VMT computations, we obtained the following results:

1. 2040 without project trips and total and average VMT for each site: AM as shown in Table 3;
2. 2040 with project trips and total and average VMT for each site: AM as shown in Table 4;
3. 2040 without project trips and total and average VMT for each site: PM as shown in Table 5;
4. 2040 with project trips and total and average VMT for each site: PM as shown in Table 6.

Attachment: P. VMT Analysis Memo (1607 : The Village Student Housing Project)

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A comparison between without and with projects for 2040 is obtained as shown in Table 7 below. While we see that the VMT Out and In increase by 30.76% (Out) and 25.43% (In) in AM and 38.17% (Out) and 40.22% (In) in PM, the averages of VMT per trip are very similar. Thus there are no significant changes in average VMT per capital. This may be due to 2040 having uncongested travel conditions and travel patterns and routes being similar with these new developments. If in 2040 the road system is very congested, then there will be longer travel routes with these higher VMT resulted from these additional trips. This would mean that average VMT per capital will increase significantly.

The CEQA guideline threshold states that a per capita VMT below 15% below 2010 existing condition is a reasonable threshold for no significant impact. Table 8 shows CEQA thresholds for both AM and PM for 2040 and that all the project sites generate average VMT less than these CEQA thresholds. Therefore these projects are of no significant impact.

Furthermore, the VMT based transportation impacts may be reduced by applying transportation demand management to reduce vehicle trips, building new roads to shorten travel distances as long as it doesn't trigger induced demand, and developing extensive mixed land use developments to a lot of intra zonal trips with no significant impacts.

Table 3: 2040 Without Project Trips and Total and Average VMT for Each Site: AM

ID	Development Site	TAZ	2040 Trips (Out)		2040 Trips (In)		2040 VMT Out	2040 VMT In	Avg VMT Out	Avg VMT In	Ave VMT
			Project	Without Project	Project	Without Project					
1	The Village Apt	242	0	159.82	0	117.5	790.91	764.42	4.95	6.51	5.71
2	Canyon Creek Apt	242	0	159.82	0	117.5	790.91	764.42	4.95	6.51	5.71
3	Open Door Com Health Ctr	247	0	91.79	0	40.86	424.93	232.33	4.63	5.69	5.00
4	Sunset Terrace Apt	247	0	91.79	0	40.86	424.93	232.33	4.63	5.69	5.00
5	Twin Park Apt	247	0	91.79	0	40.86	424.93	232.33	4.63	5.69	5.00
6	CreekSide	235	0	32.33	0	13.04	163.1	70.63	5.04	5.42	5.16
			0	627.34	0	370.62	3019.71	2296.46	4.81	6.20	5.41

Table 4: 2040 With Project Trips and Total and Average VMT for Each Site: AM

ID	Development Site	TAZ	2040 Trips (Out)		2040 Trips (In)		2040 VMT Out	2040 VMT In	Avg VMT Out	Avg VMT In	Ave VMT
			Project	With Project	Project	With Project					
1	The Village Apt	242	97	256.82	24	141.5	1273.9	917.18	4.96	6.48	5.60
2	Canyon Creek Apt	242	32	191.82	8	125.5	949.78	815.8	4.95	6.50	5.67
3	Open Door Com Health Ctr	247	15	106.79	57	97.86	493.88	557.23	4.62	5.69	5.19
4	Sunset Terrace Apt	247	58	149.79	15	55.86	694.5	317.41	4.64	5.68	4.96
5	Twin Park Apt	247	18	109.79	5	45.86	508.46	260.74	4.63	5.69	4.99
6	CreekSide	235	55	87.33	26	39.04	440.81	211.29	5.05	5.41	5.17
			275	902.34	135	505.62	4361.33	3079.65	4.83	6.09	5.35

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Table 5: 2040 Without 2040 Trips and Total and Average VMT for Each Site: PM

ID	Development Site	TAZ	2040 Trips (Out)		2040 Trips (In)		2040 VMT Out	2040 VMT In	Avg VMT Out	Avg VMT In	Ave VMT
			Project	Without Project	Project	Without Project					
1	The Village Apt	242	0	103.85	0	133.41	553.38	656.58	5.33	4.92	5.11
2	Canyon Creek Apt	242	0	103.85	0	133.41	553.38	656.58	5.33	4.92	5.11
3	Open Door Com Health Ctr	247	0	52.27	0	63.16	240.59	299.56	4.60	4.74	4.68
4	Sunset Terrace Apt	247	0	52.27	0	63.16	240.59	299.56	4.60	4.74	4.68
5	Twin Park Apt	247	0	52.27	0	63.16	240.59	299.56	4.60	4.74	4.68
6	CreekSide	235	0	16.86	0	21.27	81.88	112.27	4.86	5.28	5.10
			0	381.37	0	477.57	1910.41	2324.11	5.01	4.87	4.93

Table 6: 2040 With Project Trips and Total and Average VMT for Each Site: PM

ID	Development Site	TAZ	2040 Trips (Out)		2040 Trips (In)		2040 VMT Out	2040 VMT In	Avg VMT Out	Avg VMT In	Ave VMT
			Project	With Project	Project	With Project					
1	The Village Apt	242	53	156.85	97	230.41	832.42	1133.7	5.31	4.92	5.08
2	Canyon Creek Apt	242	20	123.85	38	171.41	658.88	843.56	5.32	4.92	5.10
3	Open Door Com Health Ctr	247	77	129.27	30	93.16	596.34	441.52	4.61	4.74	4.67
4	Sunset Terrace Apt	247	34	86.27	62	125.16	396.94	594.25	4.60	4.75	4.69
5	Twin Park Apt	247	14	66.27	26	89.16	304.98	423.07	4.60	4.75	4.69
6	CreekSide	235	45	61.86	66	87.27	300.22	451.46	4.85	5.17	5.05
			243	624.37	319	796.57	3089.78	3887.56	4.95	4.88	4.91

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Table 7: Comparison between Without and With Project Results in 2040

				AM								PM							
				Trips (Out)		Trips (In)						Trips (Out)		Trips (In)					
	ID	Development Site	TAZ	Without Project	With Project	Without Project	With Project	VMT Out	VMT In	Avg VMT Out	Avg VMT In	Without Project	With Project	Without Project	With Project	VMT Out	VMT In	Avg VMT Out	Avg VMT In
2040 Without Project	1	The Village Apt	242	0	159.82	0	117.5	790.91	764.42	4.95	6.51	0	103.85	0	133.41	553.38	656.58	5.33	4.92
	2	Canyon Creek Apt	242	0	159.82	0	117.5	790.91	764.42	4.95	6.51	0	103.85	0	133.41	553.38	656.58	5.33	4.92
	3	n Door Com Health	247	0	91.79	0	40.86	424.93	232.33	4.63	5.69	0	52.27	0	63.16	240.59	299.56	4.60	4.74
	4	Sunset Terrace Apt	247	0	91.79	0	40.86	424.93	232.33	4.63	5.69	0	52.27	0	63.16	240.59	299.56	4.60	4.74
	5	Twin Park Apt	247	0	91.79	0	40.86	424.93	232.33	4.63	5.69	0	52.27	0	63.16	240.59	299.56	4.60	4.74
	6	Creekside	235	0	32.33	0	13.04	163.1	70.63	5.04	5.42	0	16.86	0	21.27	81.88	112.27	4.86	5.28
				0	627.34	0	370.62	3019.71	2296.46	4.81	6.20	0	381.37	0	477.57	1910.41	2324.11	5.01	4.87
2040 With Project	1	The Village Apt	242	97	256.82	24	141.5	1273.9	917.18	4.96	6.48	53	156.85	97	230.41	832.42	1133.7	5.31	4.92
	2	Canyon Creek Apt	242	32	191.82	8	125.5	949.78	815.8	4.95	6.50	20	123.85	38	171.41	658.88	843.56	5.32	4.92
	3	n Door Com Health	247	15	106.79	57	97.86	493.88	557.23	4.62	5.69	77	129.27	30	93.16	596.34	441.52	4.61	4.74
	4	Sunset Terrace Apt	247	58	149.79	15	55.86	694.5	317.41	4.64	5.68	34	86.27	62	125.16	396.94	594.25	4.60	4.75
	5	Twin Park Apt	247	18	109.79	5	45.86	508.46	260.74	4.63	5.69	14	66.27	26	89.16	304.98	423.07	4.60	4.75
	6	Creekside	235	55	87.33	26	39.04	440.81	211.29	5.05	5.41	45	61.86	66	87.27	300.22	451.46	4.85	5.17
				275	902.34	135	505.62	4361.33	3079.65	4.83	6.09	243	624.37	319	796.57	3089.78	3887.56	4.95	4.88
Percent Change	1	The Village Apt	242		37.77%		16.96%	37.91%	16.66%	0.23%	-0.37%		33.79%		42.10%	33.52%	42.09%	-0.41%	-0.02%
	2	Canyon Creek Apt	242		16.68%		6.37%	16.73%	6.30%	0.05%	-0.08%		16.15%		22.17%	16.01%	22.17%	-0.16%	0.00%
	3	n Door Com Health	247		14.05%		58.25%	13.96%	58.31%	-0.10%	0.14%		59.57%		32.20%	59.66%	32.15%	0.22%	-0.07%
	4	Sunset Terrace Apt	247		38.72%		26.85%	38.81%	26.80%	0.15%	-0.07%		39.41%		49.54%	39.39%	49.59%	-0.04%	0.11%
	5	Twin Park Apt	247		16.39%		10.90%	16.43%	10.90%	0.04%	-0.01%		21.13%		29.16%	21.11%	29.19%	-0.02%	0.05%
	6	Creekside	235		62.98%		66.60%	63.00%	66.57%	0.06%	-0.08%		72.74%		75.63%	72.73%	75.13%	-0.07%	-2.03%
					30.48%		26.70%	30.76%	25.43%	0.41%	-1.73%		38.92%		40.05%	38.17%	40.22%	-1.23%	0.28%

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Table 8: CEQA Significant Criterion vs. 2010 and 2040 Ave. VMT for Each Project Site

			AM			PM		
		Area	2010 Avg VMT	2040 Avg VMT	CEQA Threshold	2010 Avg VMT	2040 Avg VMT	CEQA Threshold
	Area	Regional	7.71	8.44		7.31	8.02	
Without Project	1	The Village Apt	5.30	5.71	6.55	4.72	5.11	6.22
	2	Canyon Creek Apt	5.30	5.71	6.55	4.72	5.11	6.22
	3	Open Door Com Health Ctr	4.88	5.00	6.55	4.62	4.68	6.22
	4	Sunset Terrace Apt	4.88	5.00	6.55	4.62	4.68	6.22
	5	Twin Park Apt	4.88	5.00	6.55	4.62	4.68	6.22
	6	CreekSide	5.05	5.16	6.55	5.06	5.10	6.22
	Ave. VMT		5.13	5.41	6.55	4.70	4.93	6.22
With Project	1	The Village Apt		5.60	6.55		5.08	6.22
	2	Canyon Creek Apt		5.67	6.55		5.10	6.22
	3	Open Door Com Health Ctr		5.19	6.55		4.67	6.22
	4	Sunset Terrace Apt		4.96	6.55		4.69	6.22
	5	Twin Park Apt		4.99	6.55		4.69	6.22
	6	CreekSide		5.17	6.55		5.05	6.22
	Ave. VMT			5.35	6.55		4.91	6.22

Note. 1 CEQA Threshold = 2010 Avg VMT*0.85

2. If 2040 VMT is less than CEQA Threshold, then there is no significant impact. All the projects are of significant impact.

Attachment: P. VMT Analysis Memo (1607 : The Village Student Housing Project)

APPENDIX V

SOILS REPORT

Proposed Foster Avenue Development
For Foster Avenue LLC

Sections 20 and 29 T6N, R1E, H.M. Humboldt County
Arcata, California 95521

Prepared for:
Foster Avenue LLC
5251 Ericson Way
Arcata, California 95521

Frank R. Bickner, RG 7428,Exp. 5/31/05

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July 2002
Project No. 5196.00

SOILS REPORT

Proposed Foster Avenue Development
Foster Avenue LLC
In Sections 20 and 29 T6N, R1E, H.M. Humboldt County
Arcata, California
LACO Project No. 5196.00

INTRODUCTION

This report presents the results of our soils investigations for the proposed new development located at 2000 Foster Avenue, Humboldt County, California, (Figure 1). The proposed new development would be primarily built (primary site) on a parcel that is vacant at present (former North Coast Exports lumber mill site) and a small portion of the west adjacent pasture land (secondary site).

PROPOSED PROJECT

Foster Avenue LLC (Client) has proposed the construction of a low-income housing development at the site noted above. The new construction will encompass a vacant parcel. The proposed development site is located in Humboldt County, adjacent to Arcata, California (Figure 2).

SCOPE

LACO ASSOCIATES (LACO) was retained by Foster Avenue LLC to conduct a limited soils investigation at the proposed building site. The investigation included assessing the agriculture suitability of the site soils related to the Humboldt General Plan classification of the site soils as prime farmland. Field activities included installation of 9 backhoe test pits to approximately 5 feet below grade at the location on the site shown on Figure 2. The soil horizons were generally described using the soil survey manual. The test pits are located within the anticipated proposed development. As the Clients requested, we obtained soil samples for laboratory analysis of texture to classify the soils using the USDA soil texture classification system.

GEOLOGIC SETTING

The project site is located on an alluvial plain between Humboldt Bay and the Mad River. The alluvial plain surface is Holocene alluvial deposit that has been uplifted to its present elevation above sea level as a result of active faulting associated with the Cascadia Subduction Zone fold and thrust belt (Clarke, 1992; McLaughlin *et al*, 2000). The alluvial plain is underlain by sands, silts, clays and gravels (reference).

The proposed development site is on a relatively flat plane at an elevation of approximately 10 feet above sea level. Historically, compacted river run gravel fill appears to have been placed over the entire former mill site parcel, presumably for operations at the former industrial lumber mill site.

FIELD INVESTIGATION

Nine soil test pits were installed, sampled, and logged on May 7, 2002, and May 22, 2002, by LACO geologists with a specialty in alluvial soils (Figure 2). Six backhoe test pits were

excavated on the primary proposed project site and 3 backhoe test pits were excavated on the adjacent pastureland (secondary project site) to west of the primary site. LACO geologists logged soils in the field in general accordance with U.S. Soil Conservation Service system for describing and classifying soils. The soil descriptions from the backhoe test pits are attached to this report as Appendix I.

Samples collected on May 7, 2002, were placed in clean zip lock bags and taken to LACO's laboratory for textural analysis using the USDA soil texture classification system. The laboratory data sheets are attached to this report as Appendix II.

SURFACE CONDITIONS

This proposed development site is essentially flat lying. Remnants of concrete building foundations and concrete slabs from the former mill site are present at the site. Most of the proposed development site is presently surfaced with compacted river run gravel. Vegetation at the site generally consists of blackberries, grasses, and low shrubs.

The site appears moderately well drained. The water appears perched on the surface during heavy rainfall periods due to the decreased infiltration resulting from the compacted river run gravel.

SUBSURFACE CONDITIONS

Soils underlying the proposed "primary project site" consist of imported compacted (mechanical) river run gravel fill to an approximate depth of 1 to 2.5 feet below ground surface (bgs) (Figure 2 and logs from the test pits are attached). Below the fill, at the 1 to 2.5 foot depth, silt loam to silty clay loam were encountered to a depth of 3 to 4 feet bgs. Very fine loose sand was generally encountered below the silty loam to the bottom of the test pits. At one location (Test Pit #4), the compacted river run gravel is underlain by approximately 1.5 feet of shredded redwood bark.

Soils underlying the secondary project site generally consist of a very, dark gray to black, silty loam to silty clay loam (Ap, topsoil) to an approximate depth of 1.2 feet bgs, (Figure 2 and logs from the test pits are attached). Below the topsoil, fine sandy loam to silt clay loam was encountered to the bottom of the test pits at 2 to 2.7 feet bgs.

Groundwater was generally encountered between 2 and 4.5 feet (unstabilized depth) bgs. The stabilized depth-to-groundwater in Test Pit No. 6 was 2.2 feet bgs. When encountered, groundwater recharge into the test pits was relatively rapid.

SHN preformed subsurface investigation work at the site in 1994 (Figure 2). Their subsurface backhoe and hand auger logs indicate that they observed 1 feet to 4 feet of fill consisting of river run gravel, wood debris, and gravelly silt across the entire site. SHN's backhoe and hand auger logs are attached in this report in Appendix III.

DISCUSSION

The most recent use of the proposed primary project site was as a lumber mill site. The proposed project site has been vacant for approximately 30 years. In development of the site for lumber mill use, it appears that the upper 1 to 2 feet of the soil profile was striped off and compacted

river run gravel fill was placed across the entire site. Concrete slabs from the mill site are still present.

The primary project site is designated in the City of Arcata General Plan 2020 for medium density residential use (Residential – Medium Density – R-M). Although the subject property is within the City's sphere of influence and within the City's urban services boundary, it is not within the city limits. In order to develop the subject property in the city of Arcata, an annexation application would need to be filed with and approved by the City and the County local agency formation commission (LAFCO).

The secondary project site is currently designated in both the Humboldt County General Plan and the City's General Plan 2020 for agricultural use. The County's Agriculture Exclusive (A-E) designation is shown on the City of Arcata land use map as being outside of the City limits, and outside the City's urban services boundary. In order to develop this portion of the project site within the city of Arcata, the applicant would need to submit applications to the City for general plan amendment, pre-zone, and extension of the urban services boundary and annexation.

The City of Arcata General Plan Policy LU-6c (1) states "A-E lands shall not be developed, except for agricultural-related uses." The City's criteria for designating land for agricultural use includes a rating of the soils as they pertain to their ability to sustain agricultural activities. Based upon our soils investigation of the secondary site, and our knowledge of the City's criteria for agricultural soils, it may be difficult to obtain a designation consistent with the proposed project for this area. However, should the City decide that they would support the proposed change, they may require that the applicant prepare an environmental impact report for the project. This would give the City the ability to override any potential impacts that cannot be mitigated through a Statement of Overriding Considerations that could be prepared for impacts such as the loss of prime agricultural soils.

The soils mapping project (Draft 2002 in progress) by the National Resource Conservation Service (NRCS) has tentatively mapped the surrounding area adjacent to the proposed primary project site as Jollygiant and Dungan soils, which are generally considered prime farmland if irrigated. However, the NRCS would likely reclassify the proposed primary project sites as miscellaneous urban land were they to observe backhoe test pits as described by LACO at the primary project site (Oral communication, NRCS, May 14, 2002). Miscellaneous urban lands are not considered as prime farmland. Soils underlying the secondary project site are considered prime farmland soils by the NRCS. LACO's test pits located on the secondary site confirmed prime farmland type soils. Based on LACO's investigation, it is our opinion that the proposed primary project site is not prime farmland.

RECOMMENDATIONS
We recommend that the primary project site be reclassified as miscellaneous urban land or equivalent.

REFERENCES
Humboldt General Plan.

Arcata General Plan.
Natural Resources Conservation Service; Draft Soil Survey Mapping, 2002.

Clarke, 1992; McLaughlin *et. al.*, 2000.

Soil Survey Manual (Soil Survey Staff, 1991).

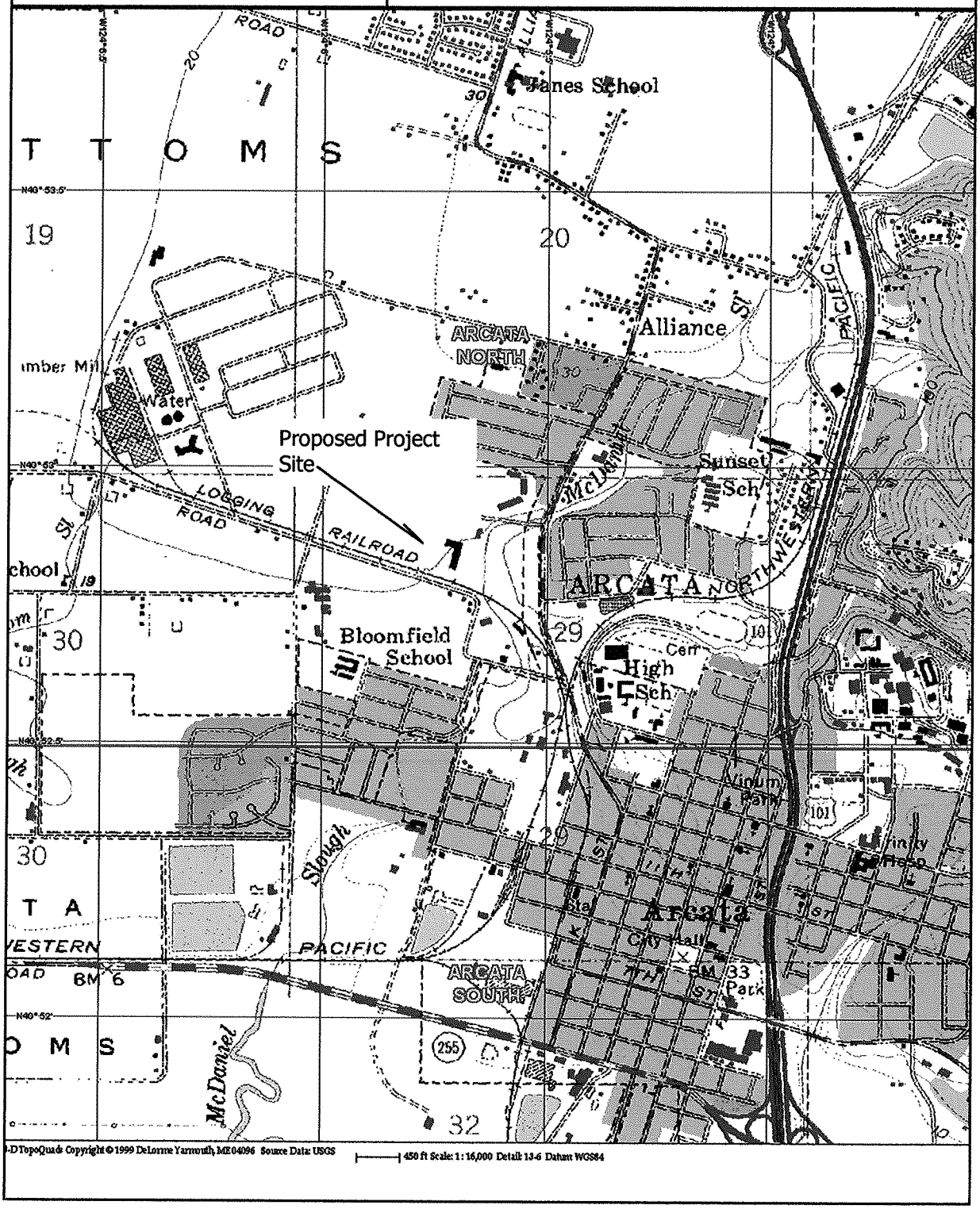
SHN; 1994, Report of Findings for 2000 Foster Avenue, Arcata, California.

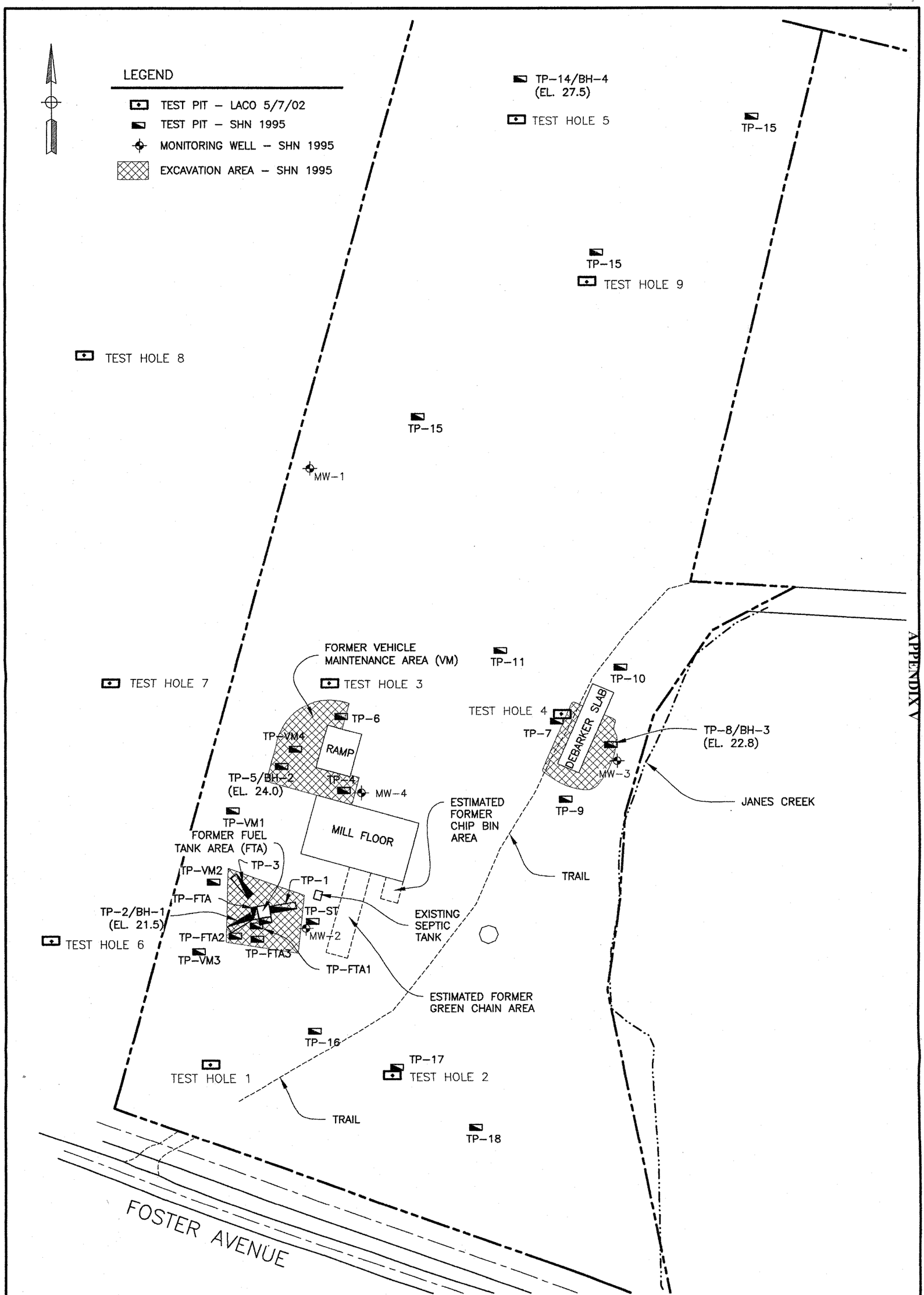
ATTACHMENTS
Figure 1: Location Map
Figure 2: Site Map

APPENDIXES
Appendix I: LACO Soil Logs
Appendix II: LACO Laboratory Results
Appendix III: SHN Backhoe and Hand Auger Soil Logs

APPENDIX V

LACO ASSOCIATES CONSULTING ENGINEERS P.O. Box 1023 • Eureka, California 95502 • 707.443.5054	PROJECT: AGRICULTURE SOILS RPT. BY: FRB	FIGURE 1
	CLIENT: FOASTER AVENUE LLC 7/17/02	
	LOCATION: 2000 FOSTER AVENUE NO SCALE	





APPENDIX V

SCALE 1"=100'	**SOIL STUDY**				**LACO ASSOCIATES**
DRAWN BAB	**SITE PLAN**				CONSULTING ENGINEERS
CHECK	**FOSTER AVENUE LLC**				21 W 4TH ST. EUREKA, CA 95501 (707)443-5054
APPVD	**FORMER SPECIALITY MILL, ARCATA**	NO.	REVISION	BY CHK DATE	
DATE 5/24/02					
JOB NO. 5196.00					
FIGURE 2					

REGISTERED PROFESSIONAL ENGINEER LEONARD M. OSBORNE NO. 38573 Exp. 03/31/05 CIVIL STATE OF CALIFORNIA

LACO ASSOCIATES
CONSULTING ENGINEERS

21 West Fourth Street, Eureka, CA 95501
TEL 707.443.5054
FAX 707.443.0553

PROJECT NAME: Foster Avenue LLC
PROJECT NO:. 5196
DATE: 5/7/2002
DRILLER:
PM:
LOGGED BY: Bickner

GLOBAL ID: Test pit #1
FIELD POINT NAME:
DRILLING METHOD:
AUGER/ROD DIAMETER (in):
LOCATION:
ELEVATION (ft):

LOCATION MAP

DEPTH (cm)	Moist COLOR (MUNSELL)	SILT AND CLAY %CLAY	%SILT	PLASTICITY N=NONE L=LOW M=MEDIUM H=HIGH	CONSISTENCY S=SOFT F=FIRM ST=STIFF H=HARD	SAND AND GRAVEL %SAND F=FINE M=MEDIUM C=COARSE	%GRAVEL F=FINE M=MEDIUM C=COARSE	SHAPE/ANGULARITY	DENSITY L=LOOSE MD=MEDIUM DENSE D=DENSE VH=VERY HARD	ASTM D-2488 GROUP SYMBOL	MOISTURE D=DRY M=MOIST W=WET S=SATURATED	% ORGANICS	ODOR	PID (ppm)	SAMPLE A=AUGER SS=SPLIT-SPOON CC=CONTINUOUS CORE PT=PUSH TUBE	OTHER REMARKS USDA Soil Testure
32.6				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Compacted river run gravel
47.3	2.5Y3/1	33	32.4	N L M H	S F ST H	F 22 C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Clay Loam
75.7	2.5Y 4/2	33	52.4	N L M H	S F ST H	F 14.6 C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Silty Clay Loam
99.9	2.5Y 4/1	23	42	N L M H	S F ST H	F 35 C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Loam
122	2.5Y 4/1	14.5	22	N L M H	S F ST H	F 63.5 C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Sandy Loam
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	

DEPTH TO WATER (cm): 134.6 (4.6 ft)
CASING TYPE/DIAMETER (in):
SCREEN INTERVAL (ft bgs):

PURGE VOLUME:
PURGE METHOD:

SAMPLING METHOD: Sidewall grab sample
ANALYTES:
CLOSURE:

APPENDIX V

LACO ASSOCIATES
CONSULTING ENGINEERS
21 West Fourth Street, Eureka, CA 95501
TEL 707.443.5054
FAX 707.443.0553

PROJECT NAME: Foster Avenue LLC
PROJECT NO:. 5196
DATE: 5/7/2002
DRILLER:
PM:
LOGGED BY: Bickner

GLOBAL ID: Test pit #2
FIELD POINT NAME:
DRILLING METHOD: Backhoe
AUGER/ROD DIAMETER (in):
LOCATION: 2000 Foster Avenue ,Arcata CA
ELEVATION (ft): ~20 ft

LOCATION MAP

DEPTH (cm)	Moist COLOR (MUNSELL)	SILT AND CLAY %CLAY	%SILT	PLASTICITY N=NONE L=LOW M=MEDIUM H=HIGH	CONSISTENCY S=SOFT F=FIRM ST=STIFF H=HARD	SAND AND GRAVEL %SAND F=FINE M=MEDIUM C=COARSE	%GRAVEL F=FINE M=MEDIUM C=COARSE	SHAPE/ANGULARITY	DENSITY L=LOOSE MD=MEDIUM DENSE D=DENSE VH=VERY HARD	ASTM D-2488 GROUP SYMBOL	MOISTURE D=DRY M=MOIST W=WET S=SATURATED	% ORGANICS	ODOR	PID (ppm)	SAMPLE A=AUGER SS=SPLIT-SPOON CC=CONTINUOUS CORE PT=PUSH TUBE	OTHER REMARKS USDA Soil Texture
30				N L / M H	S F / ST H	F / M / C			L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL / MH CH OH Pt	D M / W S				A SS / CC PT	Compacted river run gravel
63	2.5Y 3/1	35.8	14	N L / M H	S F / ST H	F / 50.2 / C			L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL / MH CH OH Pt	D M / W S				A SS / CC PT	Sandy Loam
91	2.5Y 4/2	33.2	26.7	N L / M H	S F / ST H	F / 40.1 / C			L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL / MH CH OH Pt	D M / W S				A SS / CC PT	Clay Loam
127	2.5Y 4/1	23.9	36	N L / M H	S F / ST H	F / 40.1 / C			L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL / MH CH OH Pt	D M / W S				A SS / CC PT	Loam
				N L / M H	S F / ST H	F / M / C			L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL / MH CH OH Pt	D M / W S				A SS / CC PT	
				N L / M H	S F / ST H	F / M / C			L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL / MH CH OH Pt	D M / W S				A SS / CC PT	
				N L / M H	S F / ST H	F / M / C			L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL / MH CH OH Pt	D M / W S				A SS / CC PT	
				N L / M H	S F / ST H	F / M / C			L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL / MH CH OH Pt	D M / W S				A SS / CC PT	

DEPTH TO WATER (cm): 55 (4.85 ft)
CASING TYPE/DIAMETER (in):
SCREEN INTERVAL (ft bgs):

PURGE VOLUME:
PURGE METHOD:

SAMPLING METHOD: Sidewall grab sample
ANALYTES:
CLOSURE:

APPENDIX V

LACO ASSOCIATES
CONSULTING ENGINEERS
21 West Fourth Street, Eureka, CA 95501
TEL 707.443.5054
FAX 707.443.0553

PROJECT NAME: Foster Avenue LLC
PROJECT NO:. 5196
DATE: 5/7/2002
DRILLER:
PM:
LOGGED BY: Bickner

GLOBAL ID: Test pit #3
FIELD POINT NAME:
DRILLING METHOD: Backhoe
AUGER/ROD DIAMETER (in):
LOCATION: 2000 Foster Avenue, Arcata, CA
ELEVATION (ft): ~20 ft

LOCATION MAP

DEPTH (cm)	COLOR (MUNSELL)	SILT AND CLAY: %CLAY	%SILT	PLASTICITY N=NONE L=LOW M=MEDIUM H=HIGH	CONSISTENCY S=SOFT F=FIRM ST=STIFF H=HARD	SAND AND GRAVEL: %SAND F=FINE M=MEDIUM C=COARSE	%GRAVEL F=FINE M=MEDIUM C=COARSE	SHAPE/ANGULARITY	DENSITY L=LOOSE MD=MEDIUM DENSE D=DENSE VH=VERY HARD	ASTM D-2488 GROUP SYMBOL	MOISTURE D=DRY M=MOIST W=WET S=SATURATED	% ORGANICS	ODOR	PID (ppm)	SAMPLE A=AUGER SS=SPLIT-SPOON CC=CONTINUOUS CORE PT=PUSH TUBE	OTHER REMARKS USDA Soil Texture
34.5				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Compacted river run gravel 1.2 ft depth
63	2.5Y3/1	29.8	18	N L M H	S F ST H	F 52.2 C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Sandy clay loam 2.1 ft depth
93.5	2.5Y 4/2	28.2	28	N L M H	S F ST H	F 43.8 C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Clay Loam 3.1 ft depth
128.3	2.5Y 4/1	16.1	21.3	N L M H	S F ST H	F 62.5 C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Sandy Loam 4.3 ft depth
154.4	2.5Y 5/1	12.1	21	N L M H	S F ST H	F 66.9 C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Sandy Loam 5.0 ft depth
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	

DEPTH TO WATER (ft): None observed
CASING TYPE/DIAMETER (in):
SCREEN INTERVAL (ft bgs):

PURGE VOLUME:
PURGE METHOD:

SAMPLING METHOD: Sidewall grab sample
ANALYTES:
CLOSURE:

APPENDIX V

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21 West Fourth Street, Eureka, CA 95501
TEL 707.443.5054
FAX 707.443.0553

PROJECT NAME: Foster Avenue LLC
PROJECT NO:. 5196
DATE: 5/7/2002
DRILLER:
PM:
LOGGED BY: Bickner

GLOBAL ID: Test pit #4
FIELD POINT NAME:
DRILLING METHOD: Backhoe
AUGER/ROD DIAMETER (in):
LOCATION: 2000 Foster Avenue, Arcata, CA
ELEVATION (ft): ~20

LOCATION MAP

DEPTH (cm)	COLOR (MUNSELL)	SILT AND CLAY: %CLAY	SILT AND CLAY: %SILT	PLASTICITY (N=NONE L=LOW M=MEDIUM H=HIGH)	CONSISTENCY (S=SOFT F=FIRM ST=STIFF H=HARD)	SAND AND GRAVEL: %SAND (F=FINE M=MEDIUM C=COARSE)	SAND AND GRAVEL: %GRAVEL (F=FINE M=MEDIUM C=COARSE)	SHAPE/ANGULARITY	DENSITY (L=LOOSE MD=MEDIUM DENSE D=DENSE VH=VERY HARD)	ASTM D-2488 GROUP SYMBOL	MOISTURE (D=DRY M=MOIST W=WET S=SATURATED)	% ORGANICS	ODOR	PID (ppm)	SAMPLE (A=AUGER SS=SPLIT-SPOON CC=CONTINUOUS CORE PT=PUSH TUBE)	OTHER REMARKS USDA Soil Texture
73.6				N L / M H	S F / ST H	F M C	F M C		L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL MH CH OH Pt	D M / W S				A SS / CC PT	Compacted river run gravel
106.2				N L / M H	S F / ST H	F M C	F M C		L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL MH CH OH Pt	D M / W S				A SS / CC PT	Redwood bark
154.4	2.5Y 4/1	43.8	28	N L / M H	S F / ST H	F 28.2 C	F M C		L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL MH CH OH Pt	D M / W S				A SS / CC PT	Clay
169.2	2.5Y 5/1	29.8	46	N L / M H	S F / ST H	F 24.2 C	F M C		L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL MH CH OH Pt	D M / W S				A SS / CC PT	Clay Loam
				N L / M H	S F / ST H	F M C	F M C		L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL MH CH OH Pt	D M / W S				A SS / CC PT	
				N L / M H	S F / ST H	F M C	F M C		L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL MH CH OH Pt	D M / W S				A SS / CC PT	
				N L / M H	S F / ST H	F M C	F M C		L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL MH CH OH Pt	D M / W S				A SS / CC PT	
				N L / M H	S F / ST H	F M C	F M C		L MD / D H	GW GP GM GC / SW SP SM SC / ML CL OL MH CH OH Pt	D M / W S				A SS / CC PT	

DEPTH TO WATER (cm): None observed
CASING TYPE/DIAMETER (in):
SCREEN INTERVAL (ft bgs):

PURGE VOLUME:
PURGE METHOD:

SAMPLING METHOD: Sidewall grab sample
ANALYTES:
CLOSURE:

APPENDIX V

LACO ASSOCIATES
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21 West Fourth Street, Eureka, CA 95501
TEL 707.443.5054
FAX 707.443.0553

PROJECT NAME: Foaster Avenue LLC
PROJECT NO:. 5196
DATE: 5/7/2002
DRILLER:
PM:
LOGGED BY: Bickner

GLOBAL ID: Test pit #5
FIELD POINT NAME:
DRILLING METHOD: Backhoe
AUGER/ROD DIAMETER (in):
LOCATION: 2000 Foster Avenue, Arcata, CA
ELEVATION (ft): ~ 20

LOCATION MAP

DEPTH (cm)	COLOR (MUNSELL)	SILT AND CLAY: %CLAY	%SILT	PLASTICITY N=NONE L=LOW M=MEDIUM H=HIGH	CONSISTENCY S=SOFT F=FIRM ST=STIFF H=HARD	SAND AND GRAVEL: %SAND F=FINE M=MEDIUM C=COARSE	%GRAVEL F=FINE M=MEDIUM C=COARSE	SHAPE/ANGULARITY	DENSITY L=LOOSE MD=MEDIUM DENSE D=DENSE VH=VERY HARD	ASTM D-2488 GROUP SYMBOL	MOISTURE D=DRY M=MOIST W=WET S=SATURATED	% ORGANICS	ODOR	PID (ppm)	SAMPLE A=AUGER SS=SPLIT-SPOON CC=CONTINUOUS CORE PT=PUSH TUBE	OTHER REMARKS USDA Soil Texture
71.6				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Compacted River Run Gravel (2.5 ft depth)
97.8	2.5Y 4/1			N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Clay Loam (3.3 ft depth)
110.5	2.5Y 4/1			N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Loam (3.9 ft depth)
135	2.5Y 5/1			N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Sandy Loam 4.6 ft depth)
171.42	2.5Y5/1			N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Sandy Loam (5.9 ft bottom of test pit)
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	

DEPTH TO WATER (cm): None observed
CASING TYPE/DIAMETER (in):
SCREEN INTERVAL (ft bgs):

PURGE VOLUME:
PURGE METHOD:

SAMPLING METHOD: Sidewall grab sample
ANALYTES:
CLOSURE:

APPENDIX V

LACO ASSOCIATES
CONSULTING ENGINEERS
21 West Fourth Street, Eureka, CA 95501
TEL 707.443.5054
FAX 707.443.0553

PROJECT NAME: Foster Avenue LLC
PROJECT NO:.
DATE: 5/7/2002
DRILLER:
PM:
LOGGED BY: Bickner

GLOBAL ID: Test pit #6
FIELD POINT NAME:
DRILLING METHOD: Backhoe
AUGER/ROD DIAMETER (in):
LOCATION: Secondary Site - Foster Avenue, Arcata, CA
ELEVATION (ft): ~20

LOCATION MAP

DEPTH (ft)	COLOR (MUNSELL)	SILT AND CLAY: %CLAY	%SILT	PLASTICITY N=NONE L=LOW M=MEDIUM H=HIGH	CONSISTENCY S=SOFT F=FIRM ST=STIFF H=HARD	SAND AND GRAVEL: %SAND F=FINE M=MEDIUM C=COARSE	%GRAVEL F=FINE M=MEDIUM C=COARSE	SHAPE/ANGULARITY	DENSITY L=LOOSE MD=MEDIUM DENSE D=DENSE VH=VERY HARD	ASTM D-2488 GROUP SYMBOL	MOISTURE D=DRY M=MOIST W=WET S=SATURATED	% ORGANICS	ODOR	PID (ppm)	SAMPLE A=AUGER SS=SPLIT-SPOON CC=CONTINUOUS CORE PT=PUSH TUBE	OTHER REMARKS USDA Soil Texture
45.7	10YR 3/1	27.1	39.5	N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Clay Loam (2.4 ft depth)
81.3	2.5Y 4/2	24.4	36.8	N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Loam (2.6 ft bottom of test pit)
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	

DEPTH TO WATER (cm): 69.3 (2.27 ft)
CASING TYPE/DIAMETER (in):
SCREEN INTERVAL (ft bgs):

PURGE VOLUME:
PURGE METHOD:

SAMPLING METHOD: Sidewall grab sample
ANALYTES:
CLOSURE:

APPENDIX V

LACO ASSOCIATES
CONSULTING ENGINEERS
21 West Fourth Street, Eureka, CA 95501
TEL 707.443.5054
FAX 707.443.0553

PROJECT NAME: Foster Avenue LLC
PROJECT NO:. 5196
DATE: 5/7/2002
DRILLER:
PM:
LOGGED BY: Bickner

GLOBAL ID: Test Pit #7
FIELD POINT NAME:
DRILLING METHOD: Backhoe
AUGER/ROD DIAMETER (in):
LOCATION: Secondary Site, Foster Avenue, Arcata, CA
ELEVATION (ft): ~ 20

LOCATION MAP

DEPTH (cm)	COLOR (MUNSELL)	SILT AND CLAY: %CLAY	%SILT	PLASTICITY N=NONE L=LOW M=MEDIUM H=HIGH	CONSISTENCY S=SOFT F=FIRM ST=STIFF H=HARD	SAND AND GRAVEL: %SAND F=FINE M=MEDIUM C=COARSE	%GRAVEL F=FINE M=MEDIUM C=COARSE	SHAPE/ANGULARITY	DENSITY L=LOOSE MD=MEDIUM DENSE D=DENSE VH=VERY HARD	ASTM D-2488 GROUP SYMBOL	MOISTURE D=DRY M=MOIST W=WET S=SATURATED	% ORGANICS	ODOR	PID (ppm)	SAMPLE A=AUGER SS=SPLIT-SPOON CC=CONTINUOUS CORE PT=PUSH TUBE	OTHER REMARKS USDA Soil Texture
42	10YR 3/1			N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Clay Loam (1.55 ft depth)
83	2.5Y 4/2			N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Loam (1.6 ft bottom of test pit)
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	

DEPTH TO WATER (cm): 83 (3.06 ft)
CASING TYPE/DIAMETER (in):
SCREEN INTERVAL (ft bgs):

PURGE VOLUME:
PURGE METHOD:

SAMPLING METHOD: Sidewall grab sample
ANALYTES:
CLOSURE:

APPENDIX V

LACO ASSOCIATES
CONSULTING ENGINEERS
21 West Fourth Street, Eureka, CA 95501
TEL 707.443.5054
FAX 707.443.0553

PROJECT NAME: Foster Avenue LLC
PROJECT NO:. 5196
DATE: 5/7/2002
DRILLER:
PM:
LOGGED BY: Bickner

GLOBAL ID: Test pit # 8
FIELD POINT NAME:
DRILLING METHOD:
AUGER/ROD DIAMETER (in):
LOCATION: Secondary site, Foster Avenue, Arcata, CA
ELEVATION (ft): ~20

LOCATION MAP

DEPTH (ft)	COLOR (MUNSELL)	SILT AND CLAY: %CLAY	%SILT	PLASTICITY N=NONE L=LOW M=MEDIUM H=HIGH	CONSISTENCY S=SOFT F=FIRM ST=STIFF H=HARD	SAND AND GRAVEL: %SAND F=FINE M=MEDIUM C=COARSE	%GRAVEL F=FINE M=MEDIUM C=COARSE	SHAPE/ANGULARITY	DENSITY L=LOOSE MD=MEDIUM DENSE D=DENSE VH=VERY HARD	ASTM D-2488 GROUP SYMBOL	MOISTURE D=DRY M=MOIST W=WET S=SATURATED	% ORGANICS	ODOR	PID (ppm)	SAMPLE A=AUGER SS=SPLIT-SPOON CC=CONTINUOUS CORE PT=PUSH TUBE	OTHER REMARKS
40	10YR 3/1	29.7	38.1	N L M H	S F ST H	F 32.1 C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Clay Loam (1.3 ft depth)
63	2.5Y 3/2	20.4	40.8	N L M H	S F ST H	F 38.8 C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Loam (5.25 ft bottom of test pit)
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	

DEPTH TO WATER (cm): 62(2.06 ft) Not fully recharged
CASING TYPE/DIAMETER (in):
SCREEN INTERVAL (ft bgs):

PURGE VOLUME:
PURGE METHOD:

SAMPLING METHOD: Sidewall grab sample
ANALYTES:
CLOSURE:

APPENDIX V

LACO ASSOCIATES
CONSULTING ENGINEERS

21 West Fourth Street, Eureka, CA 95501
TEL 707.443.5054
FAX 707.443.0553

PROJECT NAME: Foster Avenue LLC
PROJECT NO:. 5196
DATE: 5/7/2002
DRILLER:
PM:
LOGGED BY: Bickner

GLOBAL ID: Test pit # 9
FIELD POINT NAME:
DRILLING METHOD: Backhoe
AUGER/ROD DIAMETER (in):
LOCATION: 2000 Foster Avenue, Arcata, Ca
ELEVATION (ft): ~20

LOCATION MAP

DEPTH (ft)	COLOR (MUNSELL)	SILT AND CLAY: %CLAY	SILT AND CLAY: %SILT	SILT AND CLAY: PLASTICITY N=NONE L=LOW M=MEDIUM H=HIGH	SILT AND CLAY: CONSISTENCY S=SOFT F=FIRM ST=STIFF H=HARD	SAND AND GRAVEL: %SAND F=FINE M=MEDIUM C=COARSE	SAND AND GRAVEL: %GRAVEL F=FINE M=MEDIUM C=COARSE	SAND AND GRAVEL: SHAPE/ANGULARITY	SAND AND GRAVEL: DENSITY L=LOOSE MD=MEDIUM DENSE D=DENSE VH=VERY HARD	ASTM D-2488 GROUP SYMBOL	MOISTURE D=DRY M=MOIST W=WET S=SATURATED	% ORGANICS	ODOR	PID (ppm)	SAMPLE A=AUGER SS=SPLIT-SPOON CC=CONTINUOUS CORE PT=PUSH TUBE	OTHER REMARKS USDA Texture
65				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Compacted river run gravel (2.2 ft depth)
104	2.5Y 4/2			N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Clay Loam (3.6 ft depth)
152	2.5Y 4/1			N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Loam (5 ft depth)
189	2.5Y 5/1			N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	Sandy Loam (6.3 ft bottom of test pit)
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	

DEPTH TO WATER (ft): No groundwater observed
CASING TYPE/DIAMETER (in):
SCREEN INTERVAL (ft bgs):

PURGE VOLUME:
PURGE METHOD:

SAMPLING METHOD: Sidewall grab sample
ANALYTES:
CLOSURE:

APPENDIX V

LACO ASSOCIATES
CONSULTING ENGINEERS

21 West Fourth Street, Eureka, CA 95501
TEL 707.443.5054
FAX 707.443.0553

PROJECT NAME:
PROJECT NO:.
DATE:
DRILLER:
PM:
LOGGED BY:

GLOBAL ID:
FIELD POINT NAME:
DRILLING METHOD:
AUGER/ROD DIAMETER (in):
LOCATION:
ELEVATION (ft):

LOCATION MAP

DEPTH (ft)	COLOR (MUNSELL)	SILT AND CLAY: %CLAY	%SILT	PLASTICITY N=NONE L=LOW M=MEDIUM H=HIGH	CONSISTENCY S=SOFT F=FIRM ST=STIFF H=HARD	SAND AND GRAVEL: %SAND F=FINE M=MEDIUM C=COARSE	%GRAVEL F=FINE M=MEDIUM C=COARSE	SHAPE/ANGULARITY	DENSITY L=LOOSE MD=MEDIUM DENSE D=DENSE VH=VERY HARD	ASTM D-2488 GROUP SYMBOL	MOISTURE D=DRY M=MOIST W=WET S=SATURATED	% ORGANICS	ODOR	PID (ppm)	SAMPLE A=AUGER SS=SPLIT-SPOON CC=CONTINUOUS CORE PT=PUSH TUBE	OTHER REMARKS
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	

DEPTH TO WATER (ft):
CASING TYPE/DIAMETER (in):
SCREEN INTERVAL (ft bgs):

PURGE VOLUME:
PURGE METHOD:

SAMPLING METHOD:
ANALYTES:
CLOSURE:

APPENDIX V

LACO ASSOCIATES
CONSULTING ENGINEERS

21 West Fourth Street, Eureka, CA 95501
TEL 707.443.5054
FAX 707.443.0553

PROJECT NAME:
PROJECT NO:.
DATE:
DRILLER:
PM:
LOGGED BY:

GLOBAL ID:
FIELD POINT NAME:
DRILLING METHOD:
AUGER/ROD DIAMETER (in):
LOCATION:
ELEVATION (ft):

LOCATION MAP

DEPTH (ft)	COLOR (MUNSELL)	SILT AND CLAY: %CLAY	%SILT	PLASTICITY N=NONE L=LOW M=MEDIUM H=HIGH	CONSISTENCY S=SOFT F=FIRM ST=STIFF H=HARD	SAND AND GRAVEL: %SAND F=FINE M=MEDIUM C=COARSE	%GRAVEL F=FINE M=MEDIUM C=COARSE	SHAPE/ANGULARITY	DENSITY L=LOOSE MD=MEDIUM DENSE D=DENSE VH=VERY HARD	ASTM D-2488 GROUP SYMBOL	MOISTURE D=DRY M=MOIST W=WET S=SATURATED	% ORGANICS	ODOR	PID (ppm)	SAMPLE A=AUGER SS=SPLIT-SPOON CC=CONTINUOUS CORE PT=PUSH TUBE	OTHER REMARKS
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	
				N L M H	S F ST H	F M C	F M C		L MD D H	GW GP GM GC SW SP SM SC ML CL OL MH CH OH Pt	D M W S				A SS CC PT	

DEPTH TO WATER (ft):
CASING TYPE/DIAMETER (in):
SCREEN INTERVAL (ft bgs):

PURGE VOLUME:
PURGE METHOD:

SAMPLING METHOD:
ANALYTES:
CLOSURE:

APPENDIX V

APPENDIX V

LACE ASSOCIATES CONSULTING ENGINEERS 21 W. 4TH STREET EUREKA, CA 95501	Project MATERIAL TESTING	By DLR	Sheet No.
	Location #1	Date 5/15/02	
	Client FOSTER AVE LLC	Checked	Job No. 5196.00
		Date	

WORK SHEET FOR SOIL TEXTURE

#1	#1	#1	#1
1.1' - 1.8'	1.8' - 2.7'	2.7' - 3.4'	3.4' - 4.0'
50	50	50	100
2:50:30	2:59:00	3:05:00	3:11:30
69	69	68	68
39	49	39	43
6.3	6.3	6.5	6.5
32.7	42.7	32.5	36.5
68	68	68	68
23	23	18	21
6.5	6.5	6.5	6.5
16.5	16.5	11.5	14.5
34.6	**14.6**	**35.0**	**63.5**
33.0	**33.0**	**23.0**	**14.5**
32.4	**52.4**	**42.0**	**22.0**
CLAY LOAM	SILTY CLAY LOAM	LOAM	SANDY LOAM
ZONE 3	ZONE 4	ZONE 3	ZONE 2
65.4	85.4	65.0	36.5

SAMPLE ID

DEPTH

A. Ovendry Weight (gm)

B. Starting Time (hr: min: sec)

C. Temp @ 40 sec. (^{0}F)

D. Hydrometer Reading @ 40 sec. (gm/l)

E. Composite Correction (gm/l)

F. True Density @ 40 sec. (gm/l), (**D - E**)

G. Temp. @ 2 hrs. (^{0}F)

H. Hydrometer Reading @ 2 hrs. (gm/l)

I. Composite Correction (gm/l)

J. True Density @ 2 hrs. (gm/l), (**H - I**)

K. % Sand = 100 - [(F/A) x 100]

L. % Clay = (J/A) x 100

M. % Silt = 100 - (K+L)

N. USDA Texture

O. Soil Percolation Suitability Chart Zone

P. Combine % Silt and Clay

APPENDIX V

HALL ASSOCIATES CONSULTING ENGINEERS 21 W. 4TH STREET EUREKA, CA 95501	Project	By DLR	Sheet No.
	Location #1 2.7-3.4' & 3.4-4.0'	Date 5-15-02	
	Client Foster Ave LLC	Checked	Job No.
	~~Surve~~ REC.	Date	5196

WORK SHEET FOR SOIL TEXTURE

#1		#1	
2.7-3.4'		3.4'-4.0'	
50		100	
3:05:00		3:11:30	
68		68	
39		43	
-6.5		-6.5	
68	5:05:00	68	5:11:30
18		21	

SAMPLE NUMBER

DEPTH

A. Ovendry Weight (gm)

B. Starting Time (hr: min: sec)

C. Temp @ 40 sec. (^{0}F)

D. Hydrometer Reading @ 40 sec. (gm/l)

E. Composite Correction (gm/l)

F. True Density @ 40 sec. (gm/l), (**D - E**)

G. Temp. @ 2 hrs. (^{0}F)

H. Hydrometer Reading @ 2 hrs. (gm/l)

I. Composite Correction (gm/l)

J. True Density @ 2 hrs. (gm/l), (**H - I**)

K. % Sand = 100 - [(F/A) x 100]

L. % Clay = (J/A) x 100

M. % Silt = 100 - (K+L)

N. USDA Texture

O. Soil Percolation Suitability Chart Zone

P. Combine % Silt and Clay

APPENDIX V

HALL & ASSOCIATES CONSULTING ENGINEERS 21 W. 4TH STREET EUREKA, CA 95501	Project Material Tests	By DLR	Sheet No.
	Location #1 1.1'-1.8' & 1.8'-2.7'	Date 5-15-02	
	Client Foster AVE LLC	Checked	Job No.
	~~Curve~~ REC.	Date	5196

WORK SHEET FOR SOIL TEXTURE

#1		#1	
1.1'-1.8'		1.8-2.7	
50		50	
2:50:30		2:59:00	
69		69	
39		49	
-6.3		-6.3	
68	4:50:30	68	4:59:00
23		23	
6.5		6.5	
clay loam			
Zone 3			

SAMPLE NUMBER

DEPTH

A. Ovendry Weight (gm)

B. Starting Time (hr: min: sec)

C. Temp @ 40 sec. (^{0}F)

D. Hydrometer Reading @ 40 sec. (gm/l)

E. Composite Correction (gm/l)

F. True Density @ 40 sec. (gm/l), (**D - E**)

G. Temp. @ 2 hrs. (^{0}F)

H. Hydrometer Reading @ 2 hrs. (gm/l)

I. Composite Correction (gm/l)

J. True Density @ 2 hrs. (gm/l), (**H - I**)

K. % Sand = 100 - [(F/A) x 100]

L. % Clay = (J/A) x 100

M. % Silt = 100 - (K+L)

N. USDA Texture

O. Soil Percolation Suitability Chart Zone

P. Combine % Silt and Clay

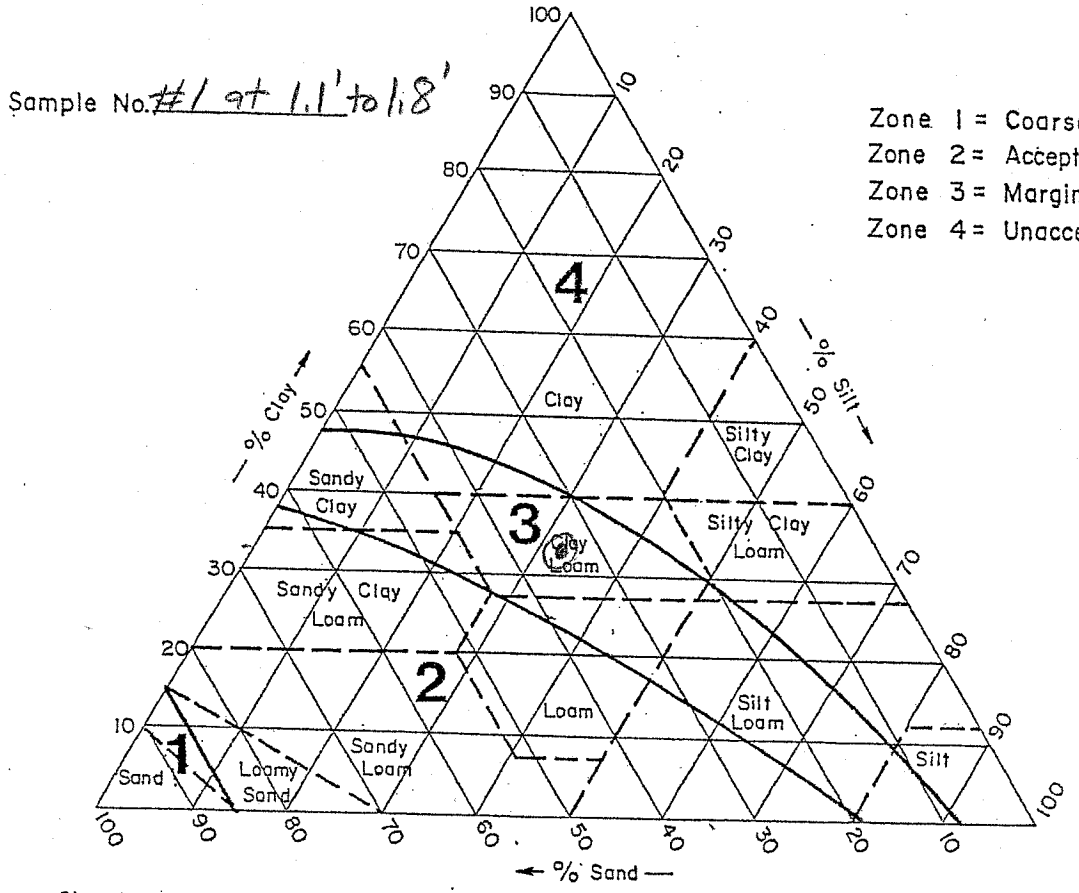
LACO ASSOCIATES
consulting engineers
21 W. 4TH STREET EUREKA, CA 95501 ·707-443-5054

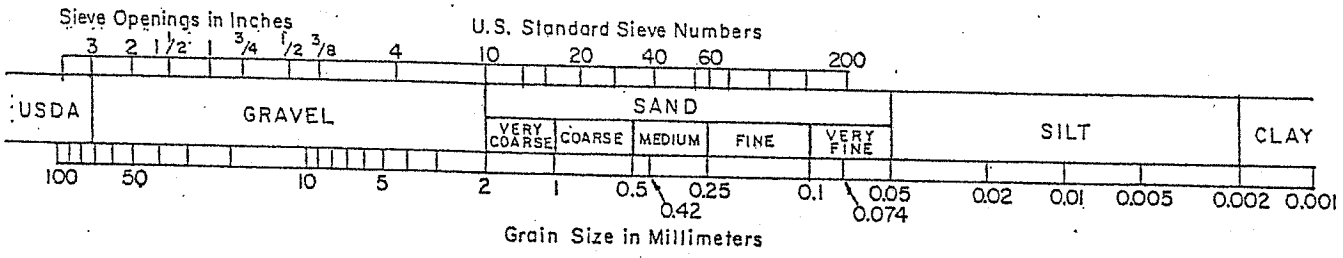
project APPENDIX V		by DLR	sheet no.
location #1 at 1.1'-1.8'		date 5-15-02	
client Foster Ave LLC		checked	job no 5196
		date	

SOIL PERCOLATION SUITABILITY CHART

Sample No. #1 at 1.1' to 1.8'

Zone 1 = Coarse
Zone 2 = Acceptable
Zone 3 = Marginal
Zone 4 = Unacceptable





INSTRUCTIONS

1. Plot texture on triangle based on percent sand, silt, and clay as determined by hydrometer analysis.
2. Adjust for coarse fragments by moving the plotted point in the sand direction an additional 2 % for each 10 % (by volume) of fragments greater than 2mm in diameter.
3. Adjust for compactness of soil by moving the plotted point in the clay direction an additional 15 % for soils having a bulk-density greater than 1.7 gm/cc.

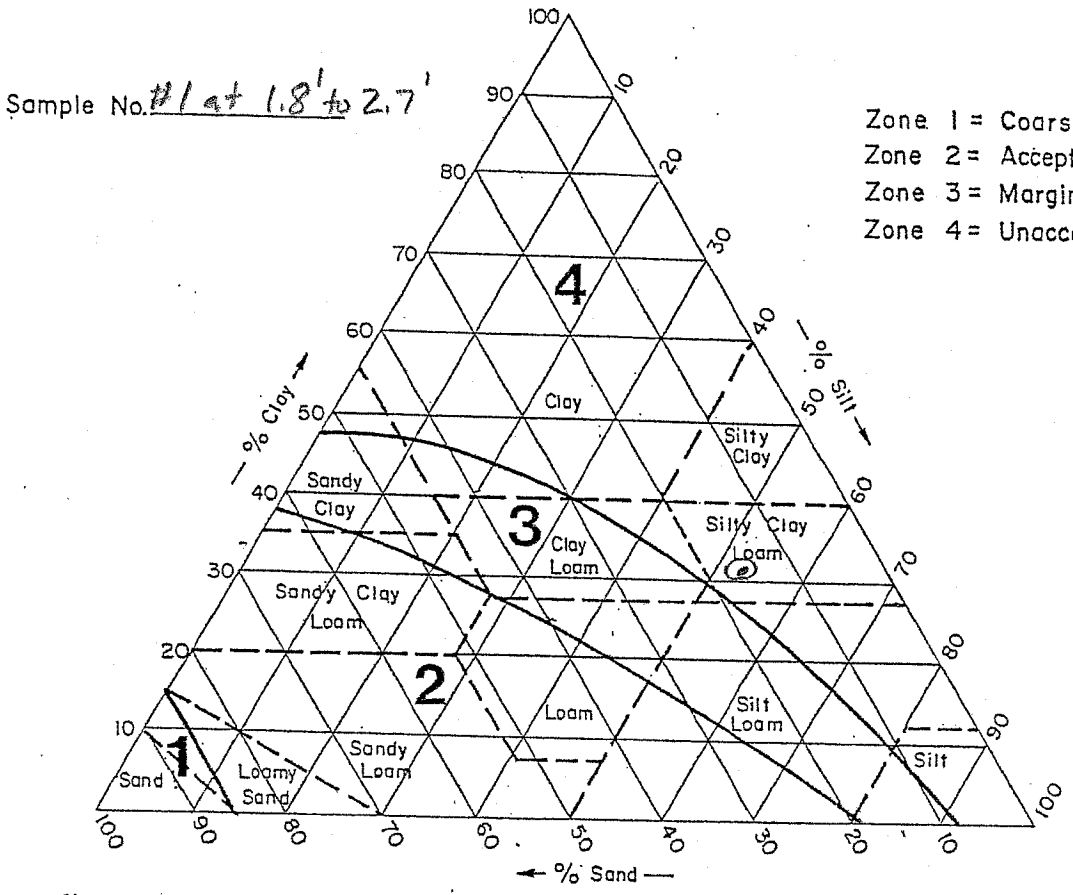
NOTE: For soils falling in sand, loamy sand or sandy loam classification bulk density analysis will generally not affect suitability and analysis not necessary.

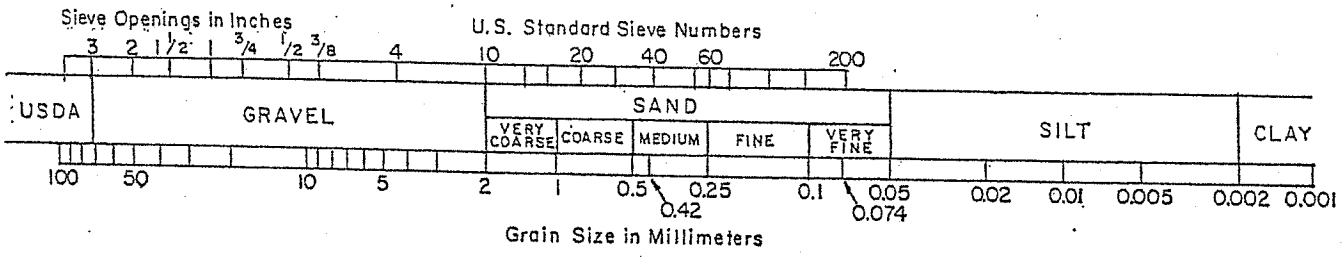
LACO ASSOCIATES consulting engineers 21 W. 4TH STREET EUREKA, CA 95501 •707-443-5054	project APPENDIX V	by DLR	sheet no.
	location #1 at 1.8'-2.7'	date 5-15-02	
	client Foster Ave LLC	checked	job no 5196
		date	

SOIL PERCOLATION SUITABILITY CHART

Sample No. #1 at 1.8' to 2.7'

Zone 1 = Coarse
Zone 2 = Acceptable
Zone 3 = Marginal
Zone 4 = Unacceptable





INSTRUCTIONS

1. Plot texture on triangle based on percent sand, silt, and clay as determined by hydrometer analysis.
2. Adjust for coarse fragments by moving the plotted point in the sand direction an additional 2 % for each 10 % (by volume) of fragments greater than 2mm in diameter.
3. Adjust for compactness of soil by moving the plotted point in the clay direction an additional 15 % for soils having a bulk-density greater than 1.7 gm/cc.

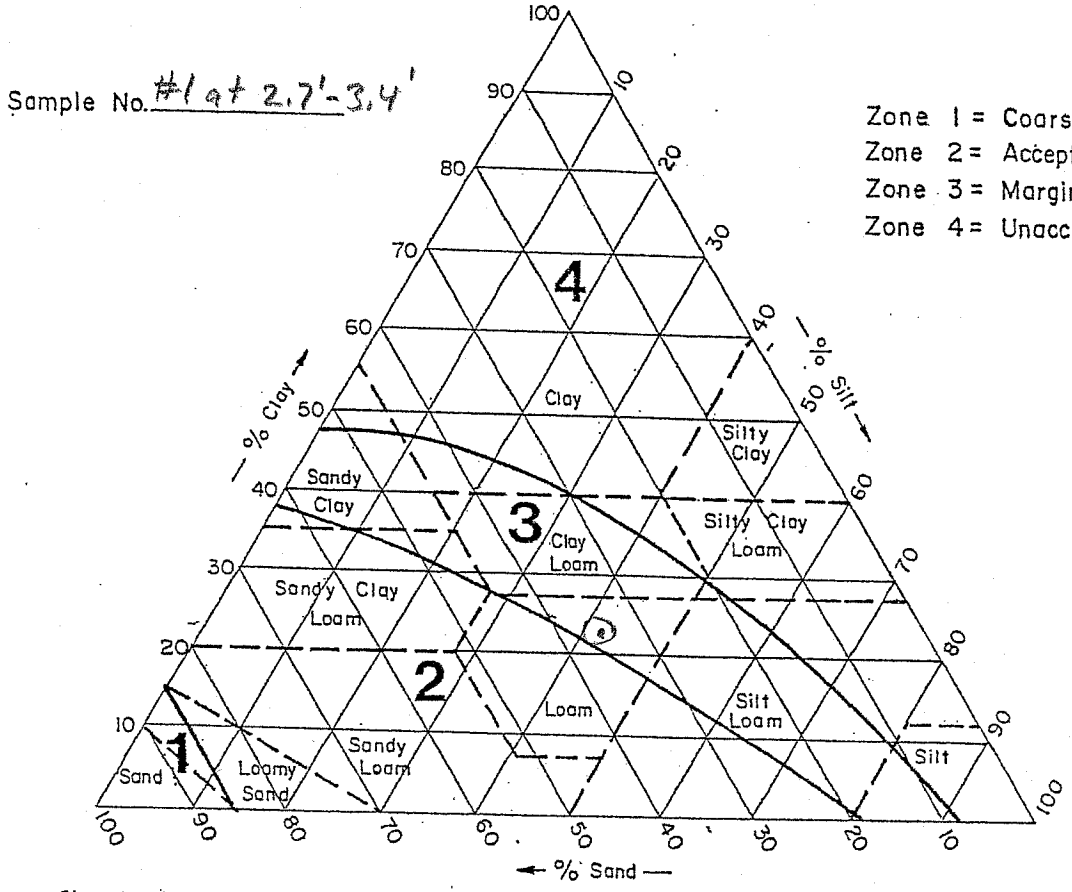
NOTE: For soils falling in sand, loamy sand or sandy loam classification bulk density analysis will generally not affect suitability and analysis not necessary.

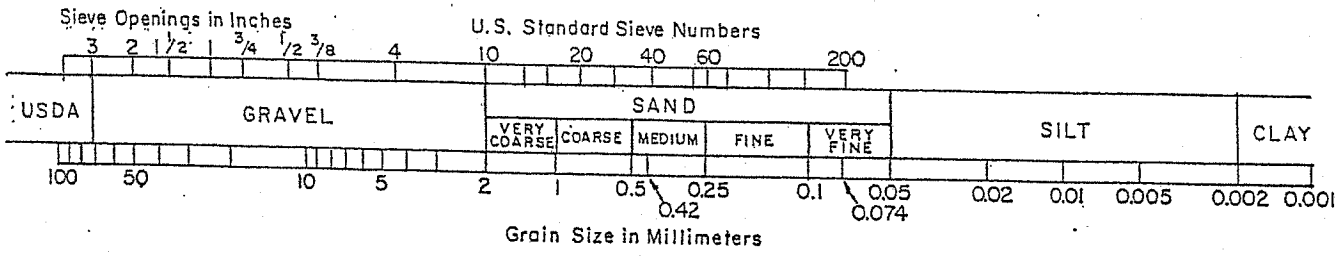
LACO ASSOCIATES consulting engineers 21 W. 4TH STREET EUREKA, CA 95501 •707-443-5054	project APPENDIX V	by DLR	sheet no.
	location #1 at 2.7'-3.4'	date 5-15-02	
	client Foster Ave LLC	checked	job no 5196
		date	

SOIL PERCOLATION SUITABILITY CHART

Sample No. #1 at 2.7'-3.4'

Zone 1 = Coarse
Zone 2 = Acceptable
Zone 3 = Marginal
Zone 4 = Unacceptable





INSTRUCTIONS

1. Plot texture on triangle based on percent sand, silt, and clay as determined by hydrometer analysis.
2. Adjust for coarse fragments by moving the plotted point in the sand direction an additional 2 % for each 10 % (by volume) of fragments greater than 2mm in diameter.
3. Adjust for compactness of soil by moving the plotted point in the clay direction an additional 15 % for soils having a bulk-density greater than 1.7 gm/cc.

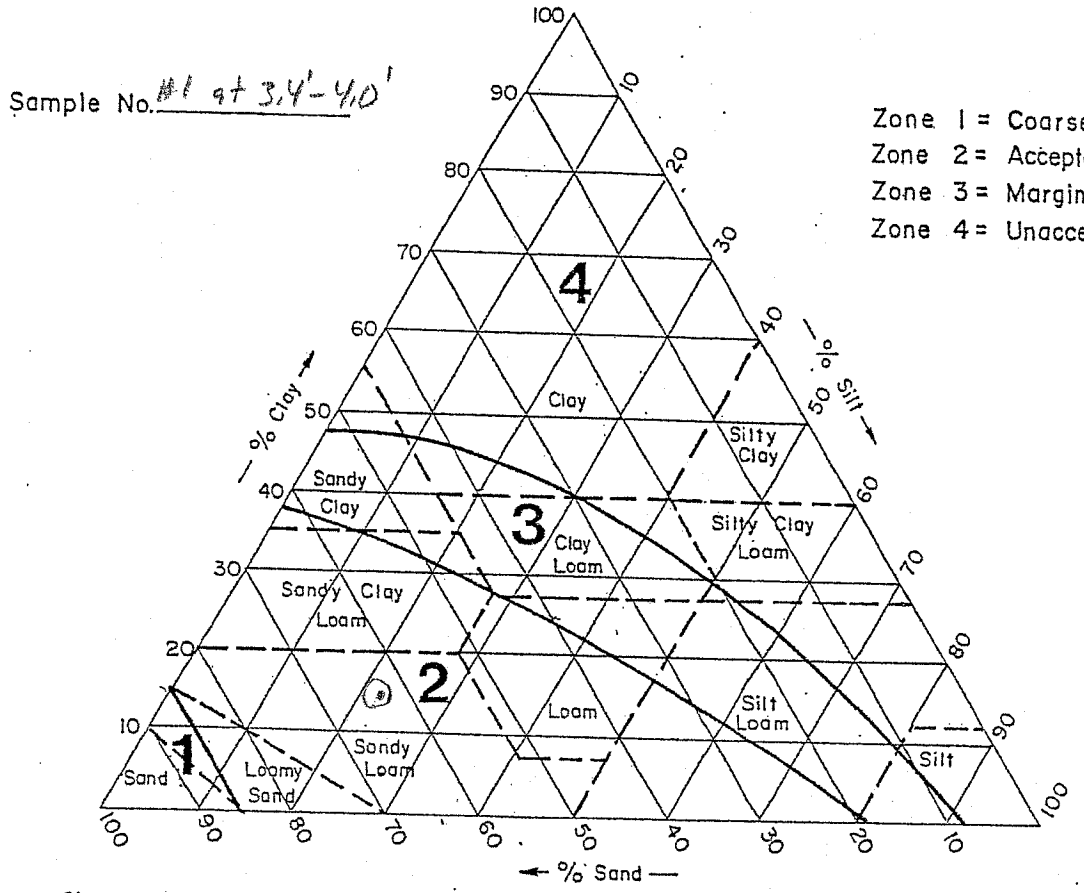
NOTE: For soils falling in sand, loamy sand or sandy loam classification bulk density analysis will generally not affect suitability and analysis not necessary.

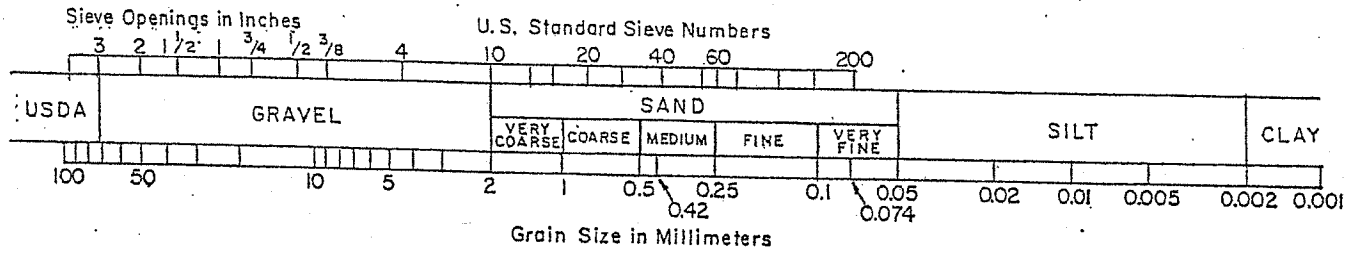
LACO ASSOCIATES consulting engineers	project APPENDIX V	by DLR	sheet no.
21 W. 4TH STREET EUREKA, CA 95501 •707-443-5054	location #1 at 3.4' - 4.0'	date 5-15-02	
	client Foster Ave LLC	checked	job no 5196
		date	

SOIL PERCOLATION SUITABILITY CHART

Sample No. #1 at 3.4' - 4.0'

Zone 1 = Coarse
Zone 2 = Acceptable
Zone 3 = Marginal
Zone 4 = Unacceptable





INSTRUCTIONS

1. Plot texture on triangle based on percent sand, silt, and clay as determined by hydrometer analysis.
2. Adjust for coarse fragments by moving the plotted point in the sand direction an additional 2 % for each 10 % (by volume) of fragments greater than 2mm in diameter.
3. Adjust for compactness of soil by moving the plotted point in the clay direction an additional 15 % for soils having a bulk-density greater than 1.7 gm/cc.

NOTE: For soils falling in sand, loamy sand or sandy loam classification bulk density analysis will generally not affect suitability and analysis not necessary.

APPENDIX V

LACO ASSOCIATES CONSULTING ENGINEERS 21 W. 4TH STREET EUREKA, CA 95501	Project MATERIAL TESTING	By DLR	Sheet No.
	Location #2	Date 5/15/02	
	Client FOSTER AVE LLC	Checked	Job No. 5196.00
		Date	

WORK SHEET FOR SOIL TEXTURE

#2	#2	#2	
1' - 2.1'	2.1' - 3.0'	3.0' - 4.25'	
50	75	75	
10:00:30	10:07:30	10:13:00	
65	65	65	
32	52	52	
7.1	7.1	7.1	
24.9	44.9	44.9	
65	65	65	
25	32	25	
7.1	7.1	7.1	
17.9	24.9	17.9	
50.2	**40.1**	**40.1**	
35.8	**33.2**	**23.9**	
14.0	**26.7**	**36.0**	
SANDY LOAM	CLAY LOAM	LOAM	
ZONE 3	ZONE 3	ZONE2	
49.8	59.9	59.9	

SAMPLE ID

DEPTH

A. Ovendry Weight (gm)

B. Starting Time (hr: min: sec)

C. Temp @ 40 sec. (^{0}F)

D. Hydrometer Reading @ 40 sec. (gm/l)

E. Composite Correction (gm/l)

F. True Density @ 40 sec. (gm/l), (**D - E**)

G. Temp. @ 2 hrs. (^{0}F)

H. Hydrometer Reading @ 2 hrs. (gm/l)

I. Composite Correction (gm/l)

J. True Density @ 2 hrs. (gm/l), (**H - I**)

K. % Sand = 100 - [(F/A) x 100]

L. % Clay = (J/A) x 100

M. % Silt = 100 - (K+L)

N. USDA Texture

O. Soil Percolation Suitability Chart Zone

P. Combine % Silt and Clay

APPENDIX V

LACO ASSOCIATES CONSULTING ENGINEERS 21 W. 4TH STREET EUREKA, CA 95501	Project	By Dm	Sheet No.
	Location	Date 5/6/02	
	Client Rooster Run	Checked	Job No.
	~~Curve~~ REC.	Date	5796

WORK SHEET FOR SOIL TEXTURE

#2

#2	#2	#2	#3
1'-2.1'	2.1'-3.0'	3.0'-4.25'	1.2-2.1
50	75	75	50
10:00:30	10:07:30	10:13:00	10:25:30
65	65	65	65
32	52	52	31
-7.1	-7.1	-7.1	-7.1
12:00:30	12:07:30	12:13:00	12:25:30
65	65	65	65
25	32	25	22
-7.1	-7.1	-7.1	

SAMPLE NUMBER

DEPTH

A. Ovendry Weight (gm)

B. Starting Time (hr: min: sec)

C. Temp @ 40 sec. (^{0}F)

D. Hydrometer Reading @ 40 sec. (gm/l)

E. Composite Correction (gm/l)

F. True Density @ 40 sec. (gm/l), (**D - E**)

G. Temp. @ 2 hrs. (^{0}F)

H. Hydrometer Reading @ 2 hrs. (gm/l)

I. Composite Correction (gm/l)

J. True Density @ 2 hrs. (gm/l), (**H - I**)

K. % Sand = 100 - [(F/A) x 100]

L. % Clay = (J/A) x 100

M. % Silt = 100 - (K+L)

N. USDA Texture

O. Soil Percolation Suitability Chart Zone

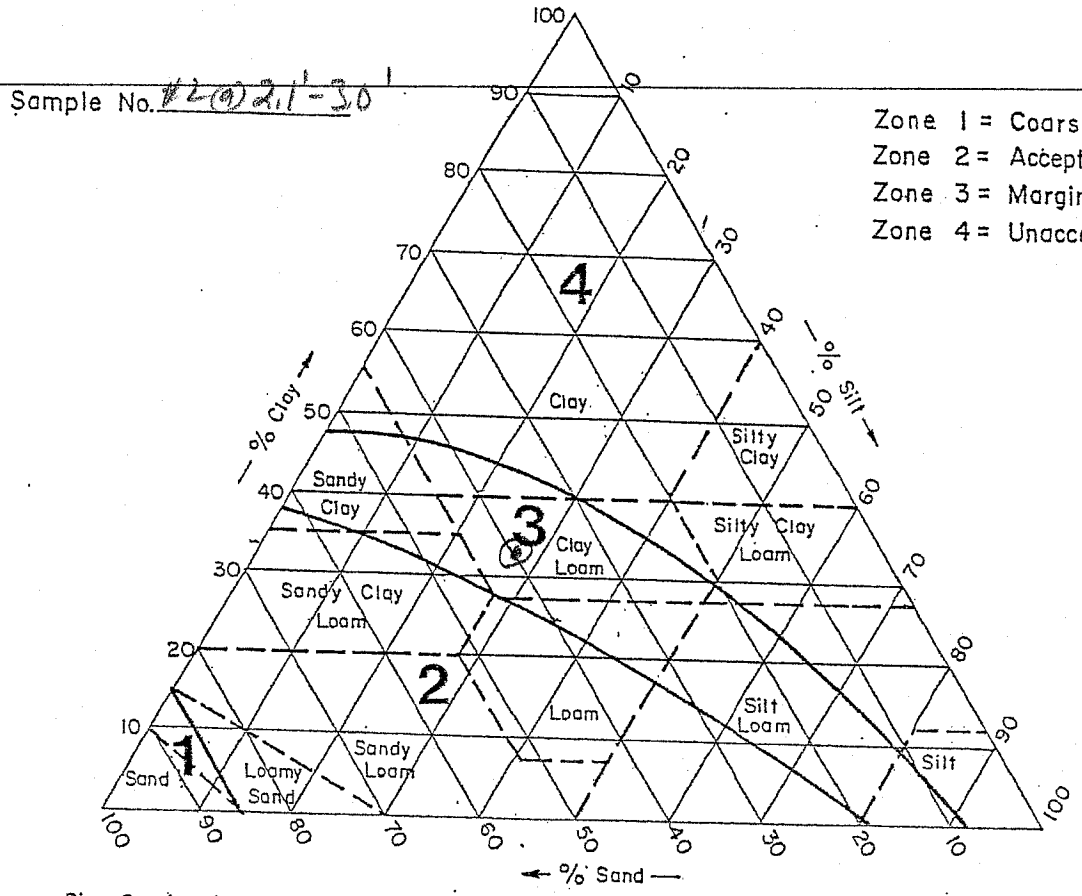
P. Combine % Silt and Clay

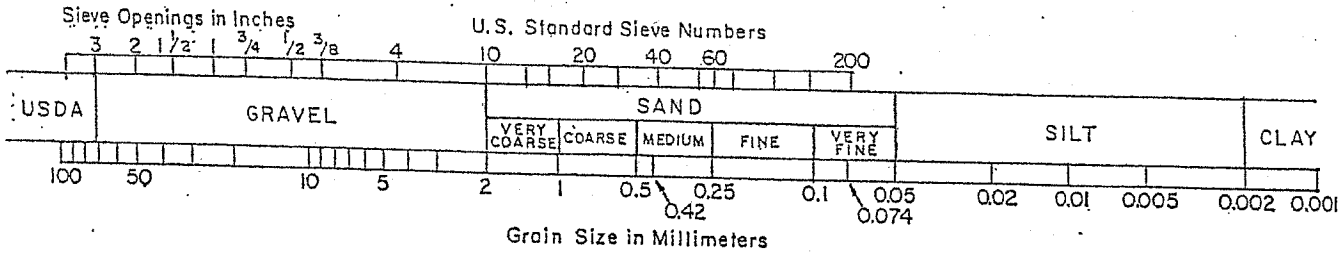
LACO ASSOCIATES consulting engineers	project Material Testing APPENDIX V	by DLR	sheet no.
21 W. 4TH STREET EUREKA, CA 95501 ·707-443-5054	location #2 at 2.1'-3.0	date 5-16-02	
	client Foster Auto	checked	job no
		date	5196

SOIL PERCOLATION SUITABILITY CHART

Sample No. #2 @ 2.1'-3.0'

Zone 1 = Coarse
Zone 2 = Acceptable
Zone 3 = Marginal
Zone 4 = Unacceptable





INSTRUCTIONS

1. Plot texture on triangle based on percent sand, silt, and clay as determined by hydrometer analysis.
2. Adjust for coarse fragments by moving the plotted point in the sand direction an additional 2 % for each 10 % (by volume) of fragments greater than 2mm in diameter.
3. Adjust for compactness of soil by moving the plotted point in the clay direction an additional 15 % for soils having a bulk-density greater than 1.7 gm/cc.

NOTE: For soils falling in sand, loamy sand or sandy loam classification bulk density analysis will generally not affect suitability and analysis not necessary.

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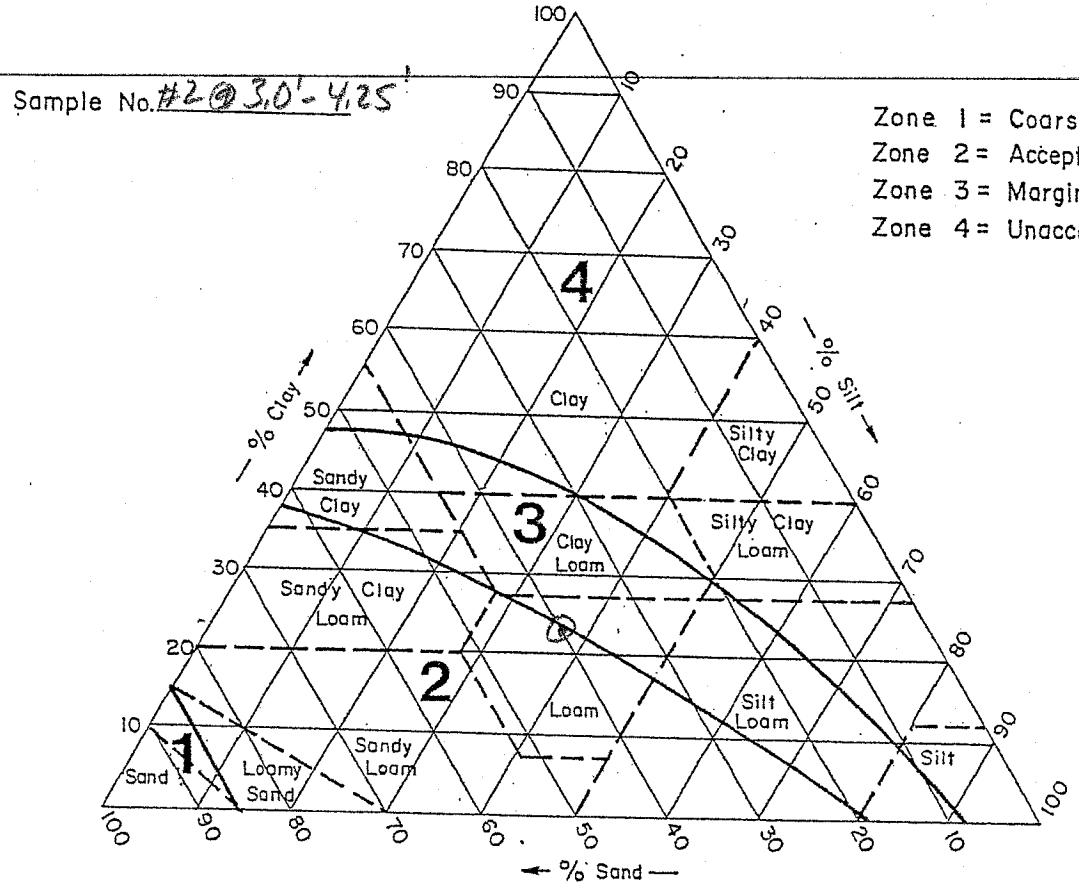
21 W. 4TH STREET EUREKA, CA 95501 •707-443-5054

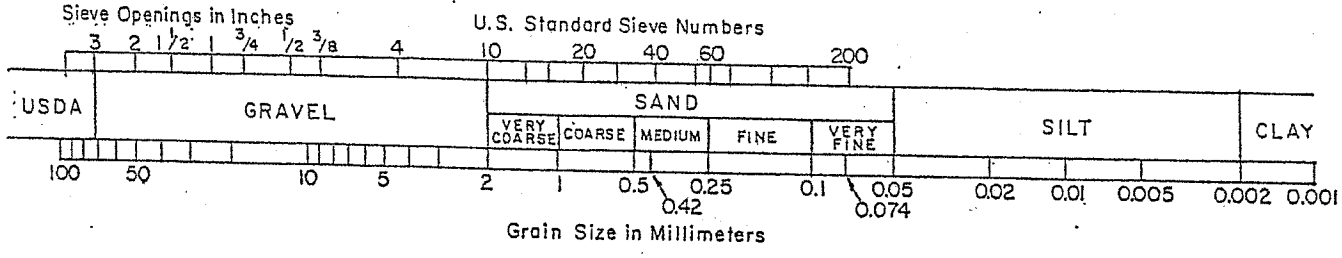
project Material Testing APPENDIX V	by DLR	sheet no.	
location #2 at 3.0'-4.25'	date 5-16-02		
client Foster Ave LLC	checked	job no	5196
	date		

SOIL PERCOLATION SUITABILITY CHART

Sample No. #2 @ 3.0'-4.25'

Zone 1 = Coarse
Zone 2 = Acceptable
Zone 3 = Marginal
Zone 4 = Unacceptable





INSTRUCTIONS

1. Plot texture on triangle based on percent sand, silt, and clay as determined by hydrometer analysis.
2. Adjust for coarse fragments by moving the plotted point in the sand direction an additional 2 % for each 10 % (by volume) of fragments greater than 2mm in diameter.
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APPENDIX V

LACO ASSOCIATES CONSULTING ENGINEERS 21 W. 4TH STREET EUREKA, CA 95501	Project MATERIAL TESTING	By DLR	Sheet No.
	Location #3	Date 5/16/02	
	Client FOSTER AVE LLC	Checked	Job No. 5196.00
		Date	

WORK SHEET FOR SOIL TEXTURE

#3	#3	#3	#3	**SAMPLE ID**
1.2' - 2.1'	2.1' - 3.1'	3.1' - 4.3'	4.3' - 5.0'	**DEPTH**
50	50	75	100	**A.** Ovendry Weight (gm)
10:25:30	10:47:00	10:55:00	11:02:00	**B.** Starting Time (hr: min: sec)
65	66	66	66	**C.** Temp @ 40 sec. (^{0}F)
31	35	35	40	**D.** Hydrometer Reading @ 40 sec. (gm/l)
7.1	6.9	6.9	6.9	**E.** Composite Correction (gm/l)
23.9	28.1	28.1	33.1	**F.** True Density @ 40 sec. (gm/l), (**D - E**)
65	66	66	66	**G.** Temp. @ 2 hrs. (^{0}F)
22	21	19	19	**H.** Hydrometer Reading @ 2 hrs. (gm/l)
7.1	6.9	6.9	6.9	**I.** Composite Correction (gm/l)
14.9	14.1	12.1	12.1	**J.** True Density @ 2 hrs. (gm/l), (**H - I**)
52.2	**43.8**	**62.5**	**66.9**	**K.** % Sand = 100 - [(F/A) x 100]
29.8	**28.2**	**16.1**	**12.1**	**L.** % Clay = (J/A) x 100
18.0	**28.0**	**21.3**	**21.0**	**M.** % Silt = 100 - (K+L)
SANDY CLAY LOAM	CLAY LOAM	SANDY LOAM	SANDY LOAM	**N.** USDA Texture
ZONE 2	ZONE 3	ZONE 2	ZONE 2	**O.** Soil Percolation Suitability Chart Zone
47.8	56.2	37.5	33.1	**P.** Combine % Silt and Clay

5196SoilTexturals.xls

APPENDIX V

CACO ASSOCIATES CONSULTING ENGINEERS	Project	By DLR	Sheet No.
	Location #3	Date 5-17-02	
	Client Foster Ave	Checked	Job No.
21 W. 4TH STREET EUREKA, CA 95501	REC.	Date	5196

WORK SHEET FOR SOIL TEXTURE

#3	#3	#3	#3 from prior day
2.1'-3.1'	3.1'-4.3'	4.3'-5.0'	1.2'-2.1
50	75	100	50
10:47:00	10:55:00	11:02:00	10:25:30
66	66	66	65
35	35	40	31
-6.9	-6.9	-6.9	-7.1
12:47:00 66	12:55:00 66	1:02:00 66	65
21	19	19	22
-6.9	-6.9	-6.9	-7.1

SAMPLE NUMBER

DEPTH

A. Ovendry Weight (gm)

B. Starting Time (hr: min: sec)

C. Temp @ 40 sec. (^{0}F)

D. Hydrometer Reading @ 40 sec. (gm/l)

E. Composite Correction (gm/l)

F. True Density @ 40 sec. (gm/l), (**D** - E)

G. Temp. @ 2 hrs. (^{0}F)

H. Hydrometer Reading @ 2 hrs. (gm/l)

I. Composite Correction (gm/l)

J. True Density @ 2 hrs. (gm/l), (**H** - **I**)

K. % Sand = 100 - [(F/A) x 100]

L. % Clay = (J/A) x 100

M. % Silt = 100 - (K+L)

N. USDA Texture

O. Soil Percolation Suitability Chart Zone

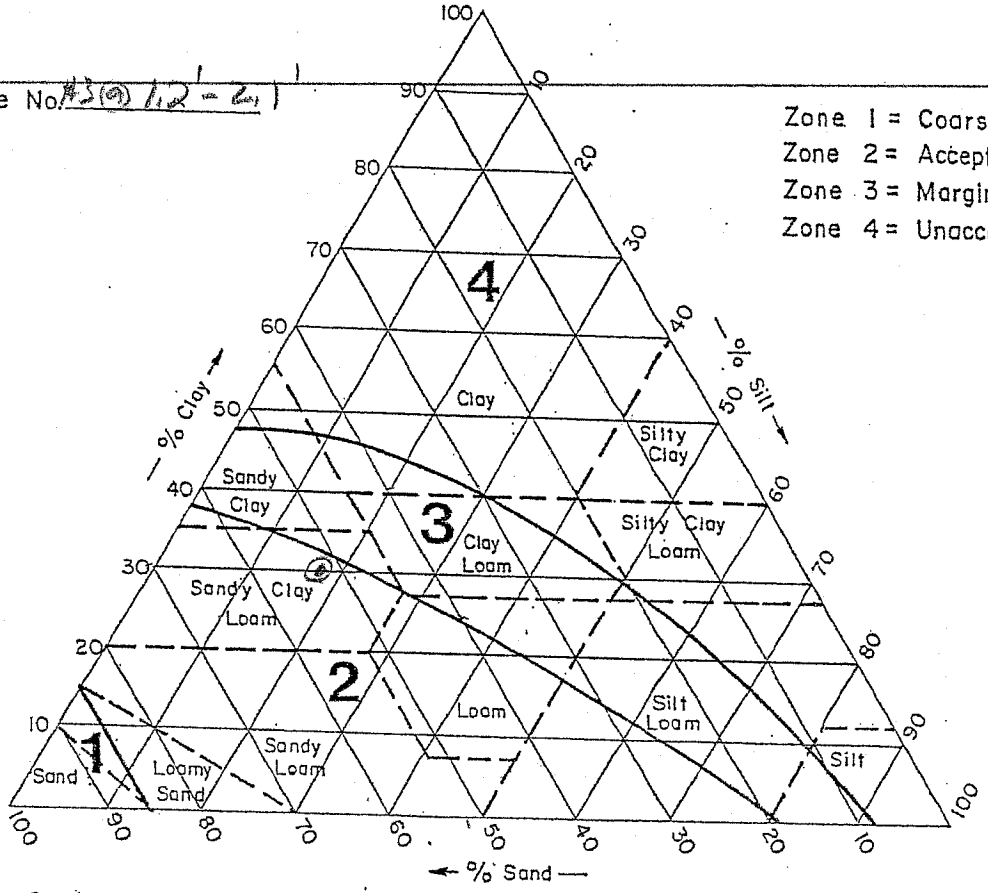
P. Combine % Silt and Clay

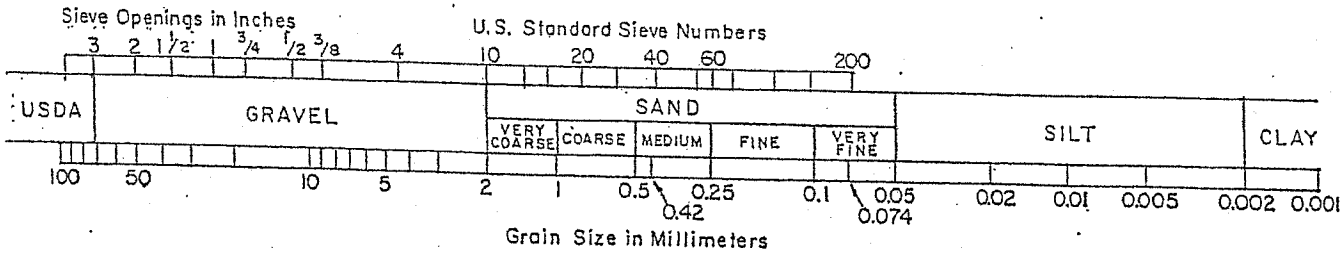
LACO ASSOCIATES consulting engineers	project Material Testing	by DLR	sheet no.
21 W. 4TH STREET EUREKA, CA 95501 ›707-443-5054	location #3 at 1.2'-2.1'	date 5-16-02	
	client Foster Ave LLC	checked	job no 5196
		date	

APPENDIX V

SOIL PERCOLATION SUITABILITY CHART

Sample No. #3 @ 1.2'-2.1'





INSTRUCTIONS

1. Plot texture on triangle based on percent sand, silt, and clay as determined by hydrometer analysis.
2. Adjust for coarse fragments by moving the plotted point in the sand direction an additional 2 % for each 10 % (by volume) of fragments greater than 2mm in diameter.
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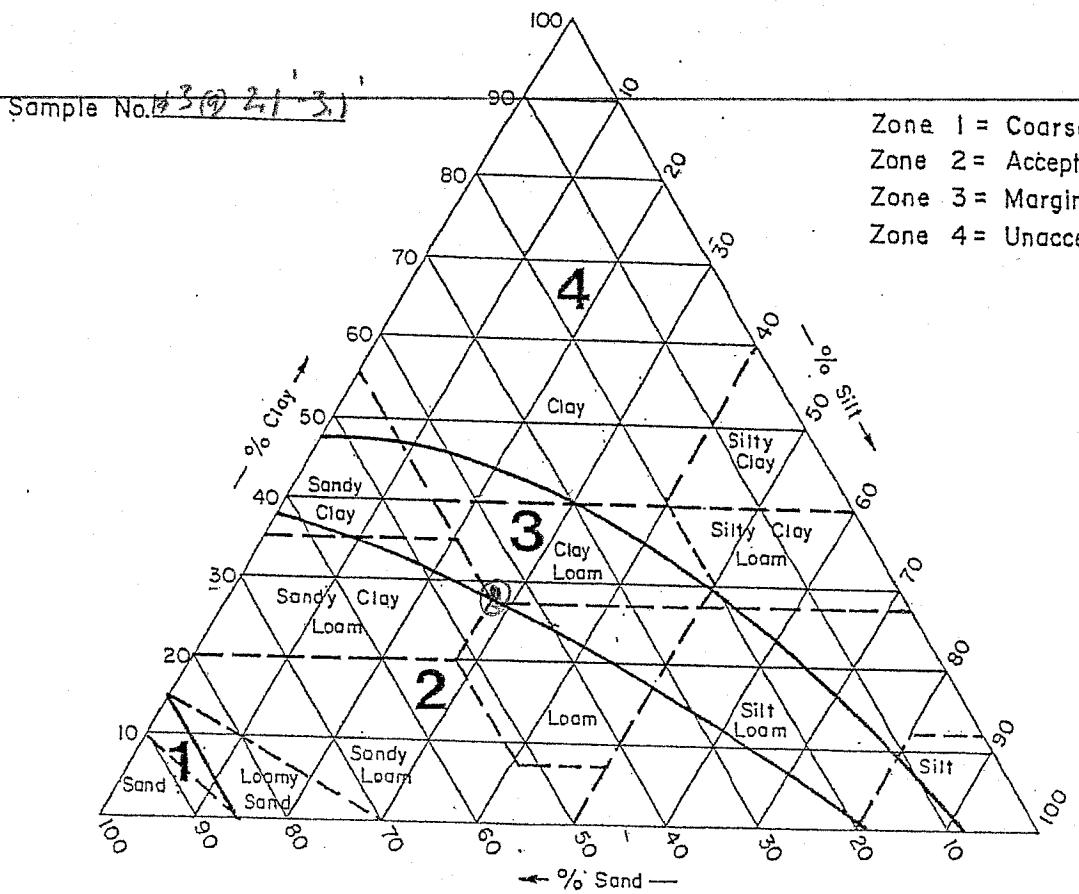
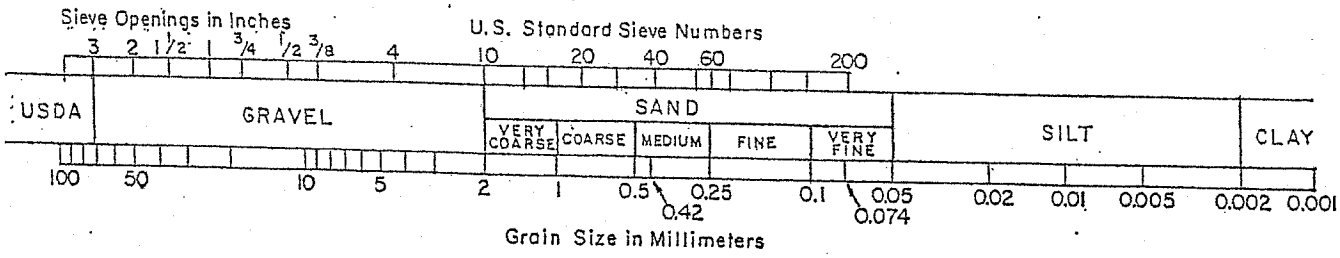
project	Material Testing APPENDIX V	by DLR	sheet no.
location	#3 @ 2.1'-3.1'	date 5-17-02	
client	Foster Ave LLC	checked	job no 5196
		date	

SOIL PERCOLATION SUITABILITY CHART

Sample No. #3 @ 2.1'-3.1'





INSTRUCTIONS

1. Plot texture on triangle based on percent sand, silt, and clay as determined by hydrometer analysis.
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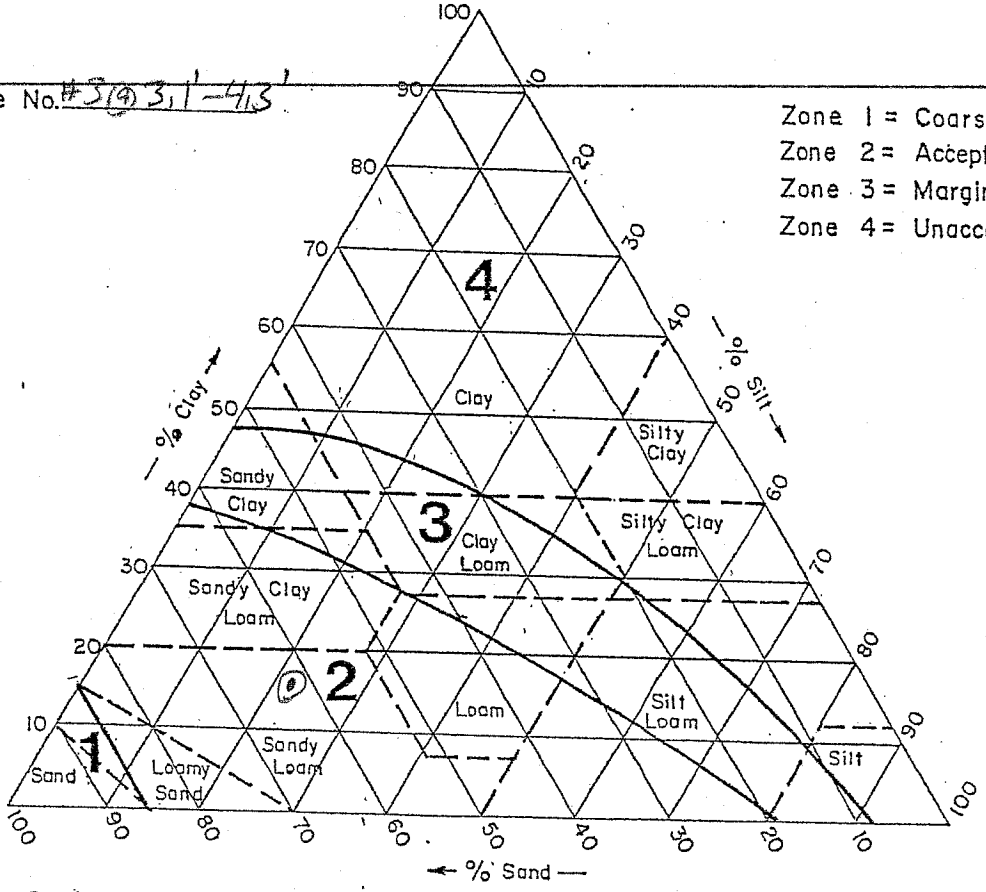
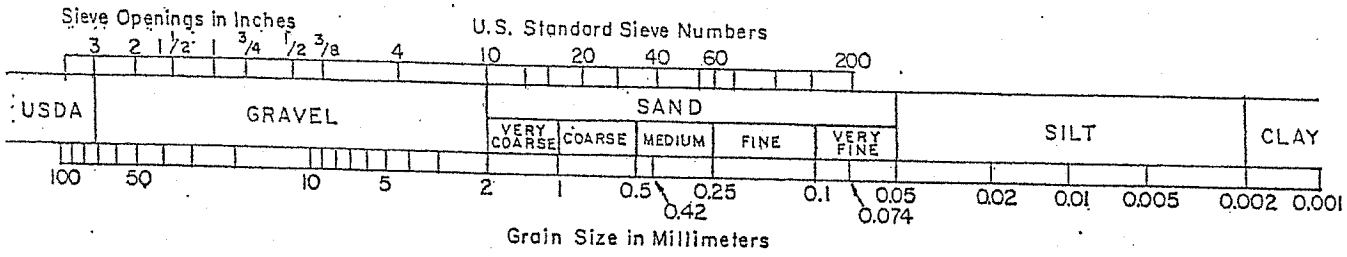
project Material Testing	by DLR	sheet no.
location #3 @ 3.1' - 4.3'	date 5-19-02	
client Foster Ave LLC	checked	job no
	date	5196

SOIL PERCOLATION SUITABILITY CHART

Sample No. #3 @ 3.1' - 4.3'

Zone 1 = Coarse
Zone 2 = Acceptable
Zone 3 = Marginal
Zone 4 = Unacceptable





INSTRUCTIONS

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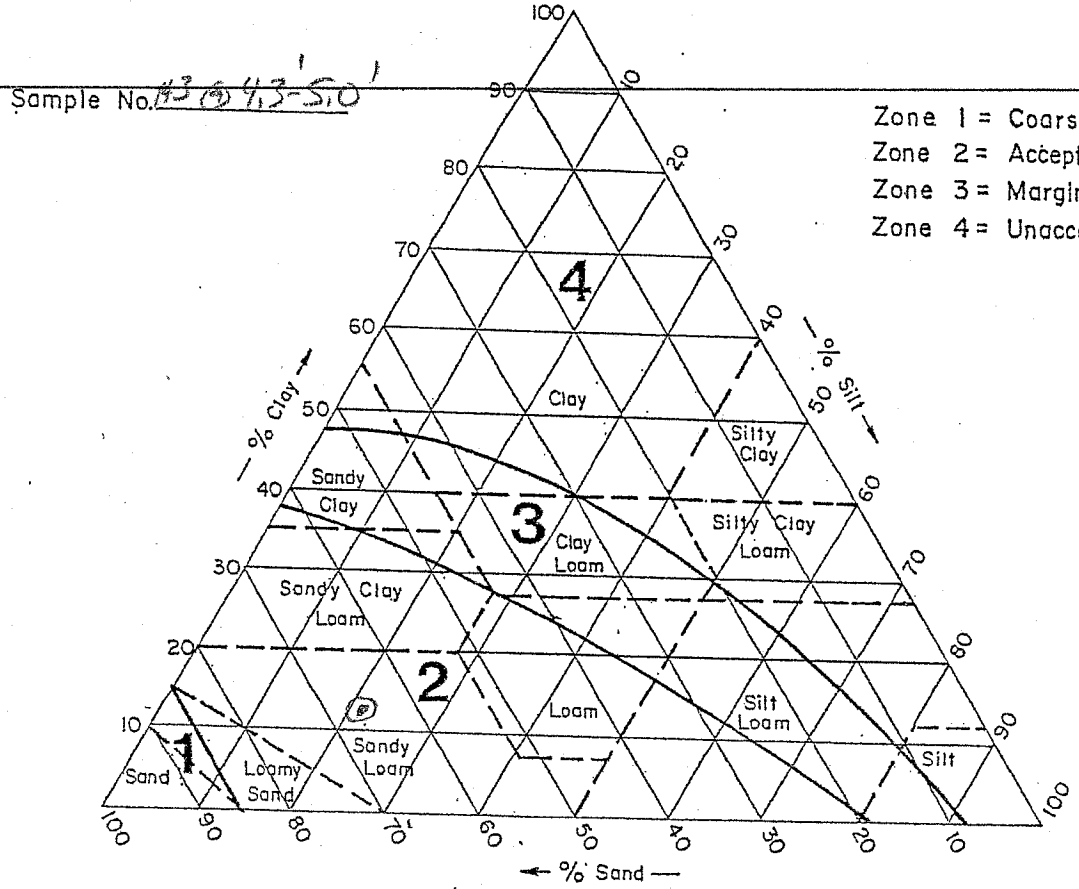
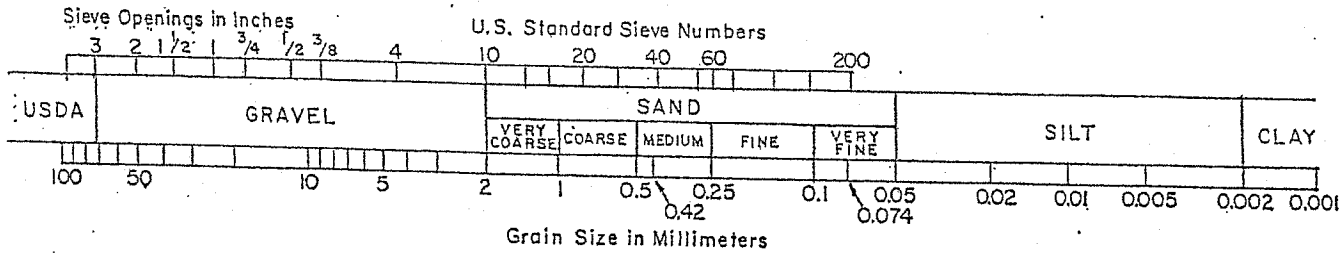
project Material Testing	APPENDIX V	by DLR	sheet no.
location #3 at 4.3'-5.0'		date 5-17-02	
client Foster Ave LLC		checked	job no 5196
		date	

SOIL PERCOLATION SUITABILITY CHART

Sample No. #3 @ 4.3'-5.0'





INSTRUCTIONS

1. Plot texture on triangle based on percent sand, silt, and clay as determined by hydrometer analysis.
2. Adjust for coarse fragments by moving the plotted point in the sand direction an additional 2 % for each 10 % (by volume) of fragments greater than 2mm in diameter.
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APPENDIX V

LACO ASSOCIATES CONSULTING ENGINEERS 21 W. 4TH STREET EUREKA, CA 95501	Project MATERIAL TESTING	By DLR	Sheet No.
	Location #4	Date	
	Client FOSTER AVE LLC	Checked	Job No. 5196.00
		Date	

WORK SHEET FOR SOIL TEXTURE

#4	#4		
3.7' - 5.1'	5.1' - 5.8'		
50	50		
10:32:30	11:09:00		
65	65		
43	45		
7.1	7.1		
35.9	37.9		
65	65		
29	22		
7.1	7.1		
21.9	14.9		
28.2	**24.2**		
43.8	**29.8**		
28.0	**46.0**		
CLAY	CLAY LOAM		
ZONE 4	ZONE 3		
71.8	75.8		

SAMPLE ID

DEPTH

A. Ovendry Weight (gm)

B. Starting Time (hr: min: sec)

C. Temp @ 40 sec. (^{0}F)

D. Hydrometer Reading @ 40 sec. (gm/l)

E. Composite Correction (gm/l)

F. True Density @ 40 sec. (gm/l), (**D - E**)

G. Temp. @ 2 hrs. (^{0}F)

H. Hydrometer Reading @ 2 hrs. (gm/l)

I. Composite Correction (gm/l)

J. True Density @ 2 hrs. (gm/l), (**H - I**)

K. % Sand = 100 - [(F/A) x 100]

L. % Clay = (J/A) x 100

M. % Silt = 100 - (K+L)

N. USDA Texture

O. Soil Percolation Suitability Chart Zone

P. Combine % Silt and Clay

APPENDIX V

LACO ASSOCIATES CONSULTING ENGINEERS 21 W. 4TH STREET EUREKA, CA 95501	Project	By AR	Sheet No.
	Location	Date 5-16-02	
	Client Foster Ave	Checked	Job No.
	~~Survey~~ REC.	Date	5196

WORK SHEET FOR SOIL TEXTURE

5/16	5/17		
#4	#4		
3.7-5.1'	5.1-5.8'		
50	50		
10:32:30	11:09:00		
65	65		
45	45		
-7.1	-7.1		
12:32:30 65	1:09:00 66		
29	22		
-7.1			

SAMPLE NUMBER

DEPTH

A. Ovendry Weight (gm)

B. Starting Time (hr: min: sec)

C. Temp @ 40 sec. (^{0}F)

D. Hydrometer Reading @ 40 sec. (gm/l)

E. Composite Correction (gm/l)

F. True Density @ 40 sec. (gm/l), (**D - E**)

G. Temp. @ 2 hrs. (^{0}F)

H. Hydrometer Reading @ 2 hrs. (gm/l)

I. Composite Correction (gm/l)

J. True Density @ 2 hrs. (gm/l), (**H - I**)

K. % Sand = 100 - [(F/A) x 100]

L. % Clay = (J/A) x 100

M. % Silt = 100 - (K+L)

N. USDA Texture

O. Soil Percolation Suitability Chart Zone

P. Combine % Silt and Clay

LACO ASSOCIATES
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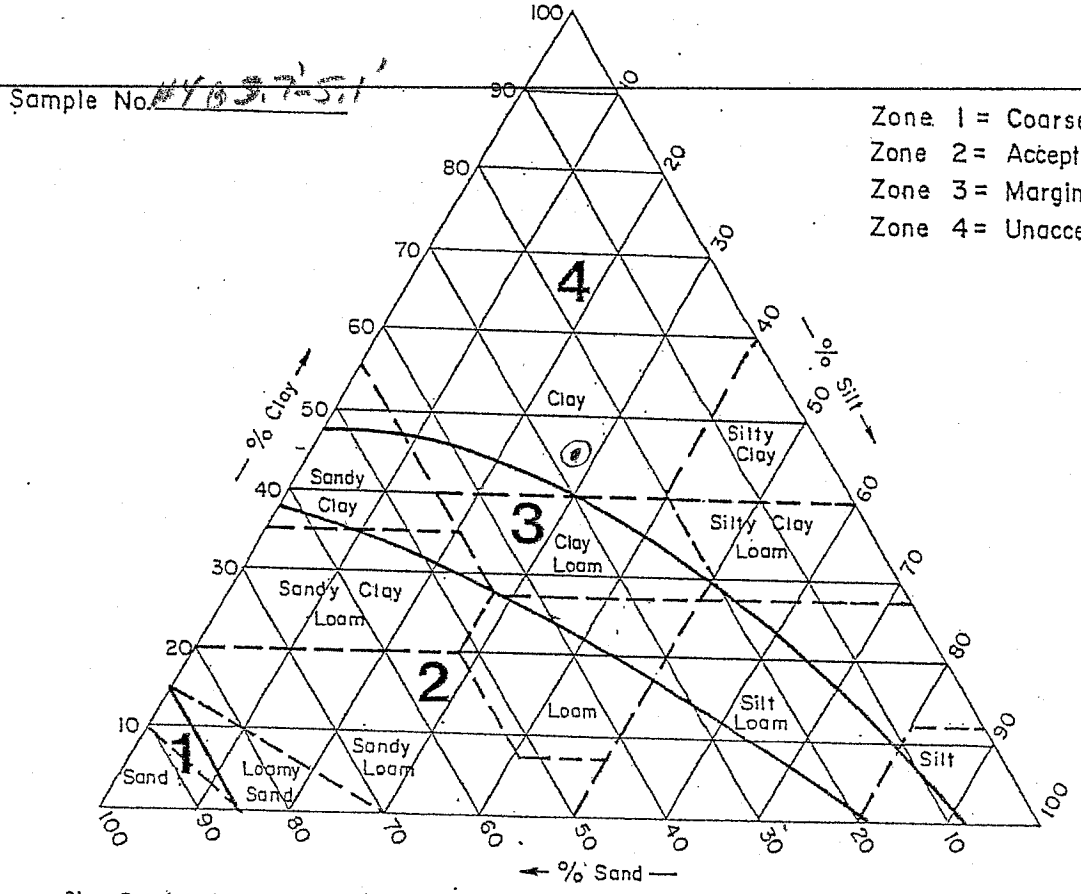
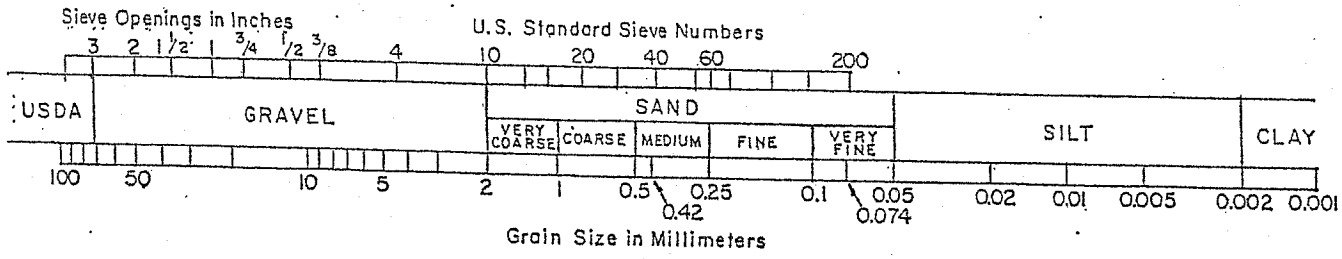
21 W. 4TH STREET EUREKA, CA 95501 ·707-443-5054

project Material Testing APPENDIX V	by DLR	sheet no.	
location #4 at 3.7'-5.1'	date 5/16-02		
client Foster Ave LLC	checked	job no	5196
	date		

SOIL PERCOLATION SUITABILITY CHART

Sample No. #4 @ 3.7'-5.1'





INSTRUCTIONS

1. Plot texture on triangle based on percent sand, silt, and clay as determined by hydrometer analysis.
2. Adjust for coarse fragments by moving the plotted point in the sand direction an additional 2 % for each 10% (by volume) of fragments greater than 2mm in diameter.
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LACO ASSOCIATES
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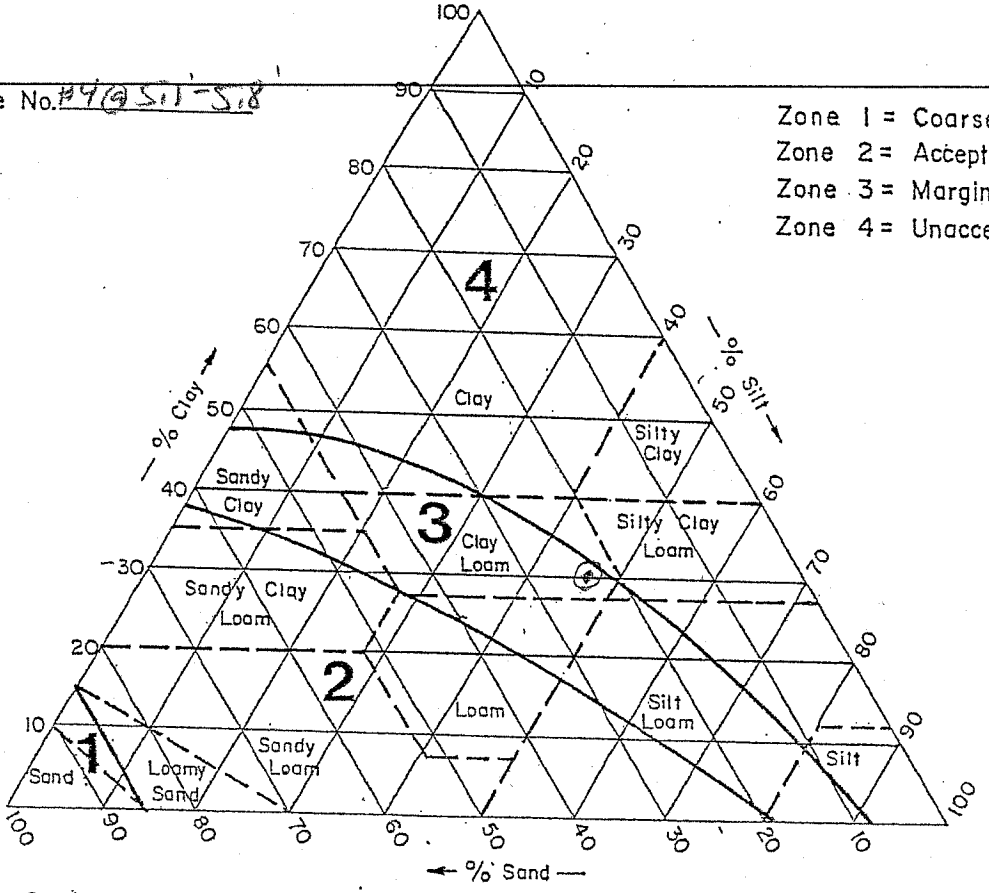
21 W. 4TH STREET EUREKA, CA 95501 ·707-443-5054

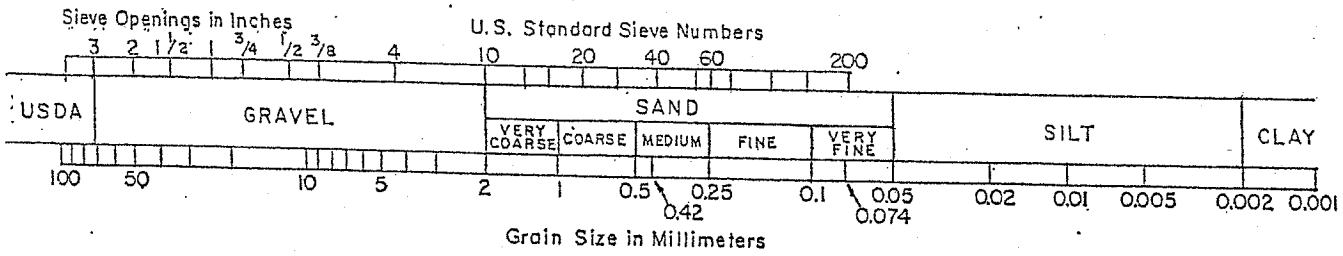
project Material Testing APPENDIX V	by DLR	sheet no.	
location #4 at 5.1' - 5.8'	date 5-17-02		
client Foster Ave LLC	checked	job no	
	date	5196	

SOIL PERCOLATION SUITABILITY CHART

Sample No. #4 @ 5.1' - 5.8'

Zone 1 = Coarse
Zone 2 = Acceptable
Zone 3 = Marginal
Zone 4 = Unacceptable





INSTRUCTIONS

1. Plot texture on triangle based on percent sand, silt, and clay as determined by hydrometer analysis.
2. Adjust for coarse fragments by moving the plotted point in the sand direction an additional 2 % for each 10 % (by volume) of fragments greater than 2mm in diameter.
3. Adjust for compactness of soil by moving the plotted point in the clay direction an additional 15 % for soils having a bulk-density greater than 1.7 gm/cc.

NOTE: For soils falling in sand, loamy sand or sandy loam classification bulk density analysis will generally not affect suitability and analysis not necessary.

APPENDIX V

LACO ASSOCIATES CONSULTING ENGINEERS 21 W. 4TH STREET EUREKA, CA 95501	Project MATERIAL TESTING	By WJM	Sheet No.
	Location #6	Date 5/20/02	
	Client FOSTER AVE LLC	Checked	Job No. 5196.00
		Date	

WORK SHEET FOR SOIL TEXTURE

#6	#6		
0' - 2.4'	2.4' - 2.6'		
75	75		
11:17:00	11:27:09		
65	65		
57	53		
7.1	7.1		
49.9	45.9		
67	67		
27	25		
6.7	6.7		
20.3	18.3		
33.5	**38.8**		
27.1	**24.4**		
39.5	**36.8**		
CLAY LOAM	LOAM		
ZONE 3	ZONE 3		
66.5	61.2		

SAMPLE ID

DEPTH

A. Ovendry Weight (gm)

B. Starting Time (hr: min: sec)

C. Temp @ 40 sec. (^{0}F)

D. Hydrometer Reading @ 40 sec. (gm/l)

E. Composite Correction (gm/l)

F. True Density @ 40 sec. (gm/l), (**D - E**)

G. Temp. @ 2 hrs. (^{0}F)

H. Hydrometer Reading @ 2 hrs. (gm/l)

I. Composite Correction (gm/l)

J. True Density @ 2 hrs. (gm/l), (**H - I**)

K. % Sand = 100 - [(F/A) x 100]

L. % Clay = (J/A) x 100

M. % Silt = 100 - (K+L)

N. USDA Texture

O. Soil Percolation Suitability Chart Zone

P. Combine % Silt and Clay

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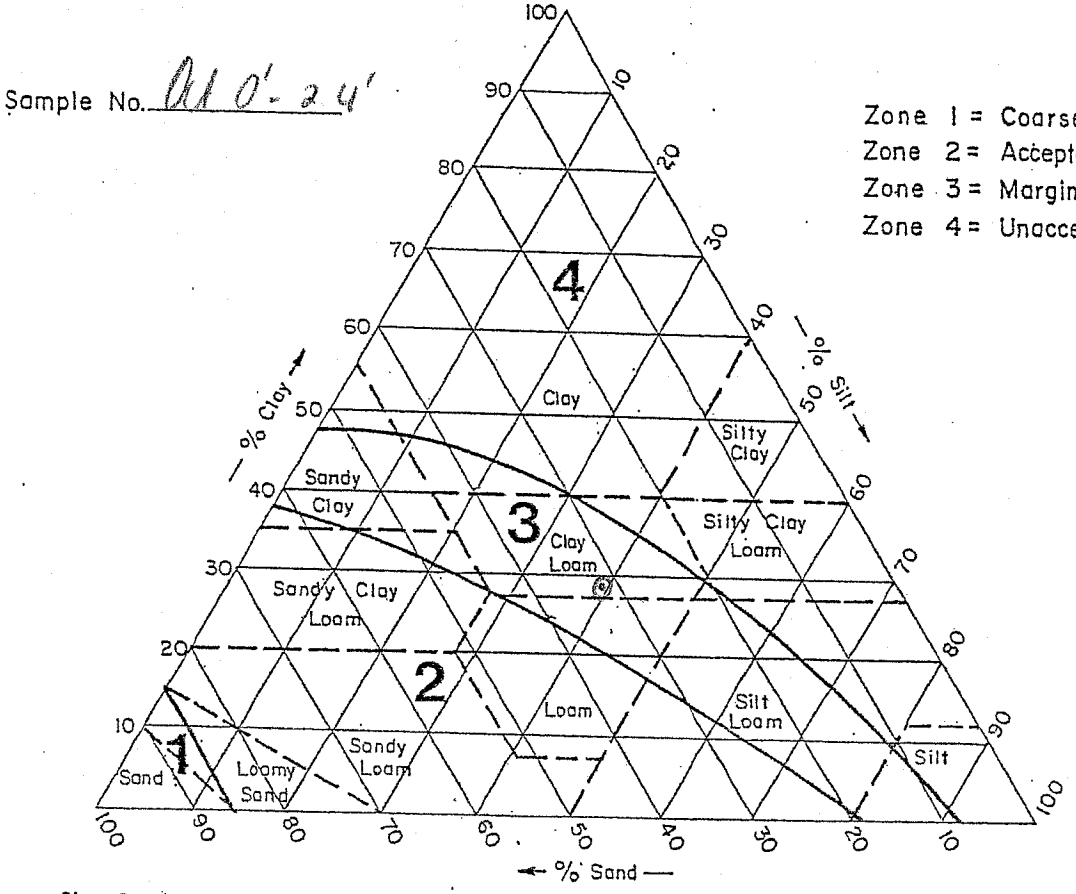
consulting engineers
21 W. 4TH STREET EUREKA, CA 95501 •707-443-5054

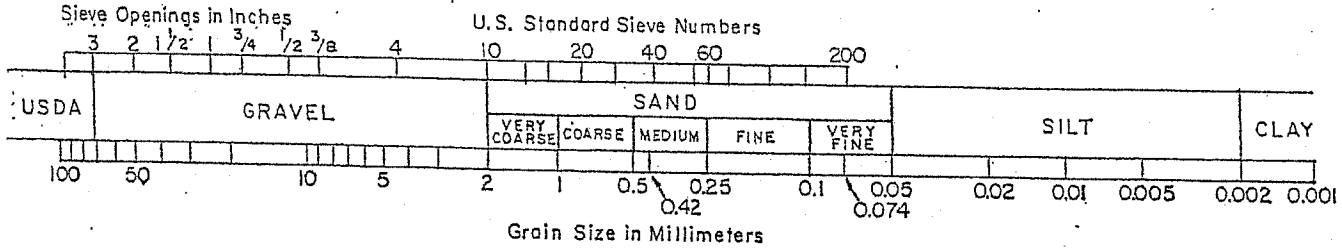
project APPENDIX V		by WJM	sheet no.
location #6 @ 0'-2.4'		date 5-20-02	
client Taston AUS LLC		checked	job no 5196
		date	

SOIL PERCOLATION SUITABILITY CHART

Sample No. #1 0'-2.4'

Zone 1 = Coarse
Zone 2 = Acceptable
Zone 3 = Marginal
Zone 4 = Unacceptable





INSTRUCTIONS

1. Plot texture on triangle based on percent sand, silt, and clay as determined by hydrometer analysis.
2. Adjust for coarse fragments by moving the plotted point in the sand direction an additional 2 % for each 10 % (by volume) of fragments greater than 2mm in diameter.
3. Adjust for compactness of soil by moving the plotted point in the clay direction an additional 15 % for soils having a bulk-density greater than 1.7 gm/cc.

NOTE: For soils falling in sand, loamy sand or sandy loam classification bulk density analysis will generally not affect suitability and analysis not necessary.

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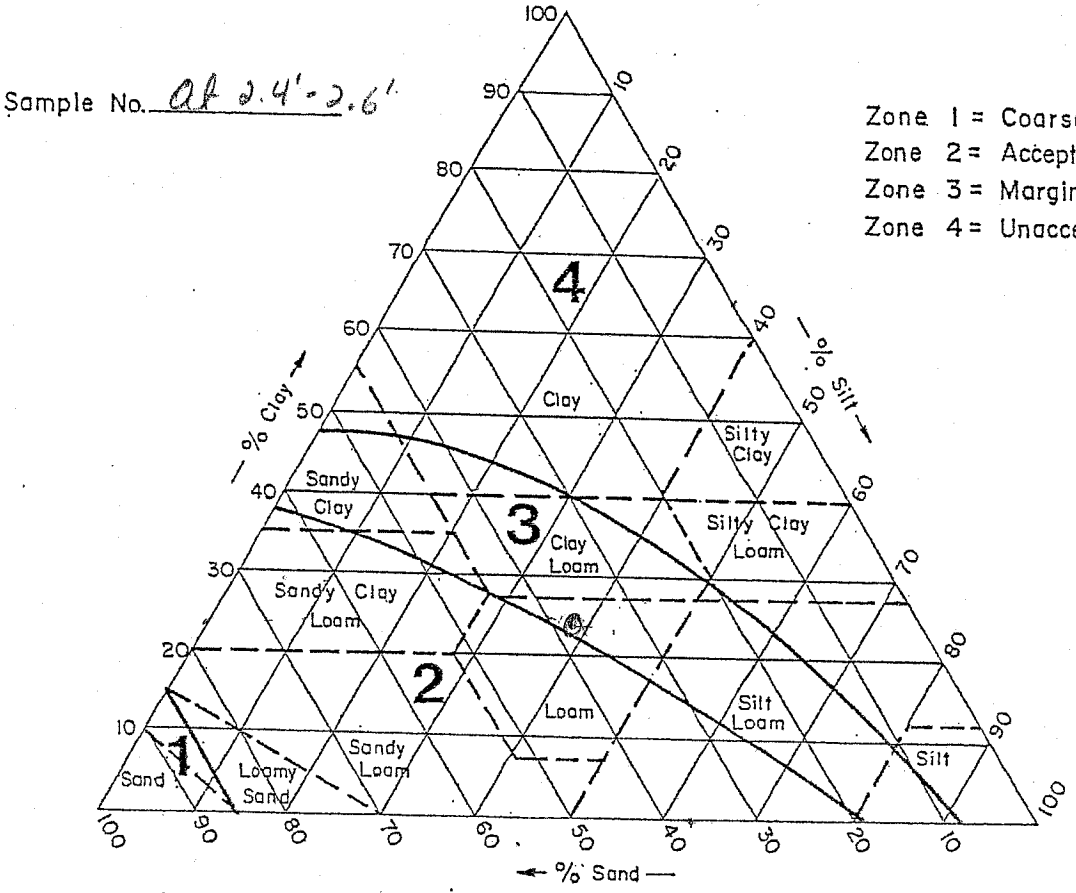
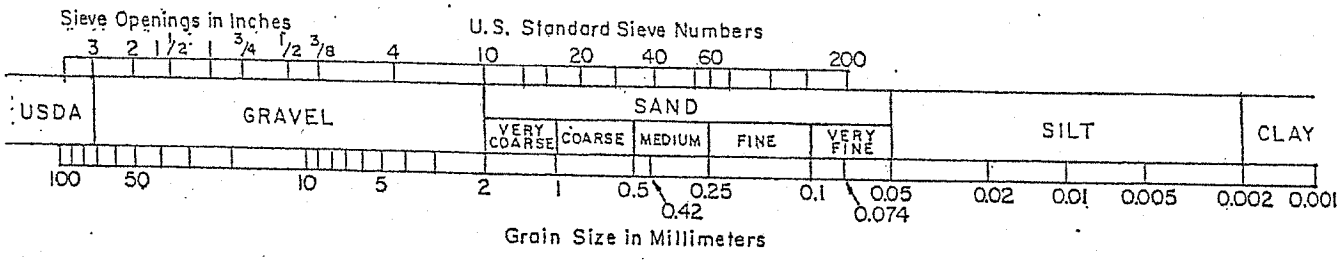
project APPENDIX V		by GJM	sheet no.
location #6 @ 2.4'-2.6'		date 5-20-02	
client Forton AUC LLC		checked	job no 5796.00
		date	

SOIL PERCOLATION SUITABILITY CHART

Sample No. #6 @ 2.4'-2.6'

Zone 1 = Coarse
Zone 2 = Acceptable
Zone 3 = Marginal
Zone 4 = Unacceptable





INSTRUCTIONS

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APPENDIX V

LACO ASSOCIATES CONSULTING ENGINEERS	Project MATERIAL TESTING	By WJM	Sheet No.
	Location #8	Date 5/20/02	
	Client FOSTER AVE LLC	Checked	Job No. 5196.00
21 W. 4TH STREET EUREKA, CA 95501		Date	

WORK SHEET FOR SOIL TEXTURE

#8	#8		
0' - 1.5'	1.5' - 2.1'		
75	75		
11:42:16	11:49:50		
65	65		
58	53		
7.1	7.1		
50.9	45.9		
67	67		
29	22		
6.7	6.7		
22.3	15.3		
32.1	**38.8**		
29.7	**20.4**		
38.1	**40.8**		
CLAY LOAM	LOAM		
ZONE 3	ZONE 2		
67.9	61.2		

SAMPLE ID

DEPTH

A. Ovendry Weight (gm)

B. Starting Time (hr: min: sec)

C. Temp @ 40 sec. (^{0}F)

D. Hydrometer Reading @ 40 sec. (gm/l)

E. Composite Correction (gm/l)

F. True Density @ 40 sec. (gm/l), **(D - E)**

G. Temp. @ 2 hrs. (^{0}F)

H. Hydrometer Reading @ 2 hrs. (gm/l)

I. Composite Correction (gm/l)

J. True Density @ 2 hrs. (gm/l), **(H - I)**

K. % Sand = 100 - [(F/A) x 100]

L. % Clay = (J/A) x 100

M. % Silt = 100 - (K+L)

N. USDA Texture

O. Soil Percolation Suitability Chart Zone

P. Combine % Silt and Clay

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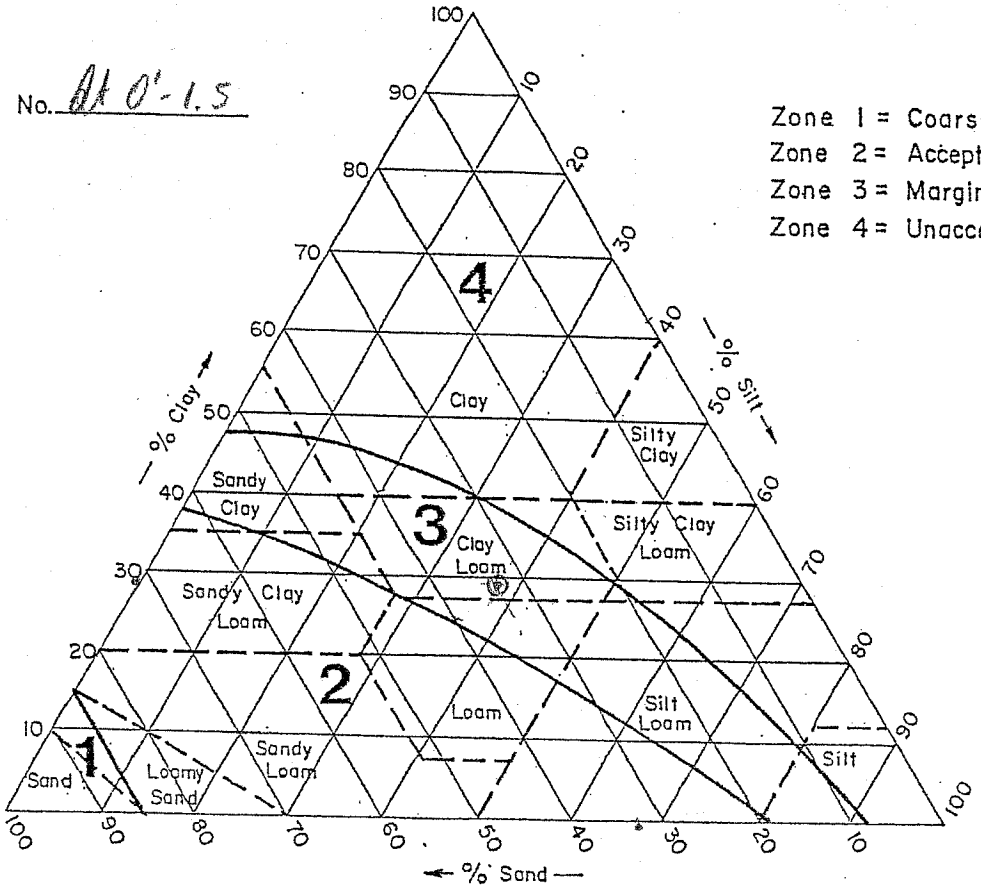
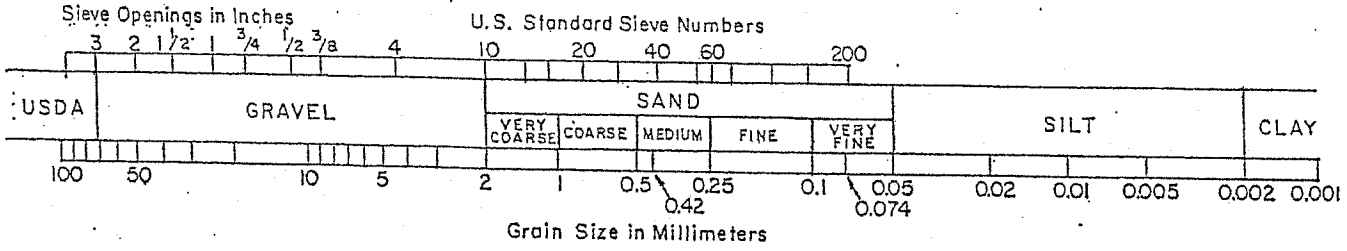
project APPENDIX V		by	sheet no.
location H8 @ 0'-1.5'		date 4/5/02	
client Foster Auto LLC		checked 5-20-02	job no 5196.00
		date	

SOIL PERCOLATION SUITABILITY CHART

Sample No. H8 0'-1.5





INSTRUCTIONS

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2. Adjust for coarse fragments by moving the plotted point in the sand direction an additional 2 % for each 10 % (by volume) of fragments greater than 2mm in diameter.
3. Adjust for compactness of soil by moving the plotted point in the clay direction an additional 15 % for soils having a bulk-density greater than 1.7 gm/cc.

NOTE: For soils falling in sand, loamy sand or sandy loam classification bulk density analysis will generally not affect suitability and analysis not necessary.

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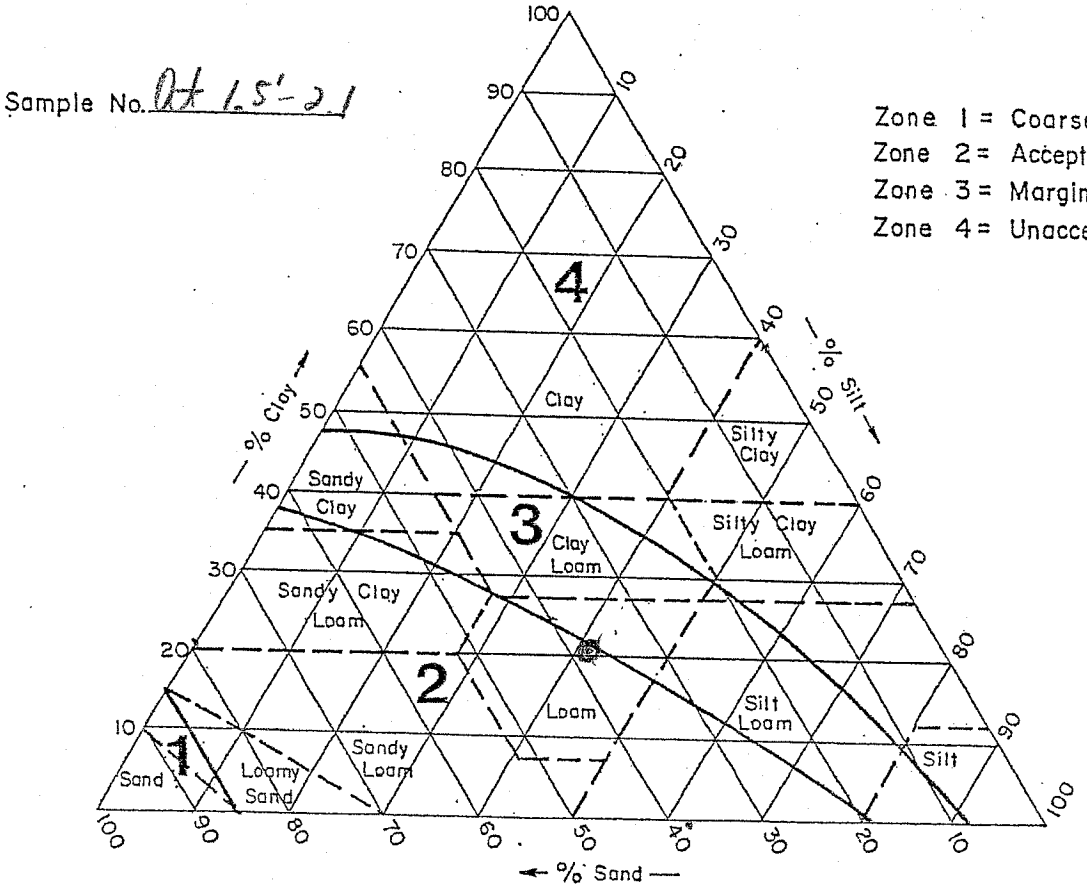
consulting engineers
21 W. 4TH STREET EUREKA, CA 95501 ·707-443-5054

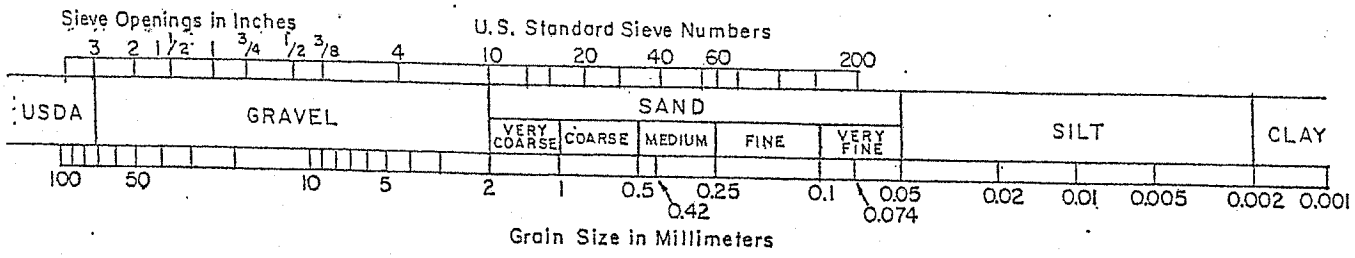
project APPENDIX V	by WSM	sheet no.	
location # 8 @ 1.5'-2.1'	date 5-20-02		
client Folten AVE LLC	checked	job no	5196.00
	date		

SOIL PERCOLATION SUITABILITY CHART

Sample No. #8 @ 1.5'-2.1'

Zone 1 = Coarse
Zone 2 = Acceptable
Zone 3 = Marginal
Zone 4 = Unacceptable





INSTRUCTIONS

1. Plot texture on triangle based on percent sand, silt, and clay as determined by hydrometer analysis.
2. Adjust for coarse fragments by moving the plotted point in the sand direction an additional 2 % for each 10 % (by volume) of fragments greater than 2mm in diameter.
3. Adjust for compactness of soil by moving the plotted point in the clay direction an additional 15 % for soils having a bulk-density greater than 1.7 gm/cc.

NOTE: For soils falling in sand, loamy sand or sandy loam classification bulk density analysis will generally not affect suitability and analysis not necessary.

APPENDIX V

HOLE NUMBER TP-ST

PROJECT North Coast Exports
JOB NUMBER 930121.100
LOCATION Arcata, CA
DATE DRILLED 2/17/94
GROUND SURFACE ELEVATION
SAMPLER TYPE Hand sampled
EXCAVATION METHOD Backhoe
LOGGED BY BRD
TOTAL DEPTH OF HOLE 5.0ft.

REMARKS	DEPTH (ft.)	SAMPLES	% RECOVERY	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	REMARKS
	0					FILL, gravel, silty, loose, moist, dark brown, well rounded gravel to 4" maximum dimension.	
	1					FILL, drain rock, sandy, silty, loose, well rounded gravel to 2" maximum dimension.	Drain rock to bottom of excavation at north end of test pit, to 2.0' at south end.
	2				ML	SILT, sandy, slightly clayey, medium stiff, very moist, dark gray. Free water in drain rock at 2.5' at north end of test pit.	▽ 2/17/94 at north end
	3						
	4						
	5					Bottom of excavation at 5.0 feet.	
	6						
	7						
	8						
	9						
	10						
	11						
	12						

APPENDIX V

HOLE NUMBER FTA-3

PROJECT North Coast Exports
LOCATION Arcata, CA
GROUND SURFACE ELEVATION
EXCAVATION METHOD Backhoe
LOGGED BY BRD

JOB NUMBER 930121.100
DATE DRILLED 2/17/94
SAMPLER TYPE N/A
TOTAL DEPTH OF HOLE 4.0ft.

REMARKS	DEPTH (ft.) / SAMPLES	% RECOVERY	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	REMARKS
	0				FILL, gravel, sandy, slightly clayey, medium dense, very moist, brown.	
	1				FILL, sand, well graded, very clayey, gravelly, slightly silty, rounded and angular gravel to 2" maximum dimension.	
	2			ML	SILT, very clayey, slightly sandy, stiff, moist, dark brown, very fine sand.	
	3			CL	CLAY, slightly sandy, stiff, moist, brown, very fine sand.	
	4				Bottom of excavation at 4.0 feet. No free groundwater encountered.	
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					

APPENDIX V

HOLE NUMBER FTA-1

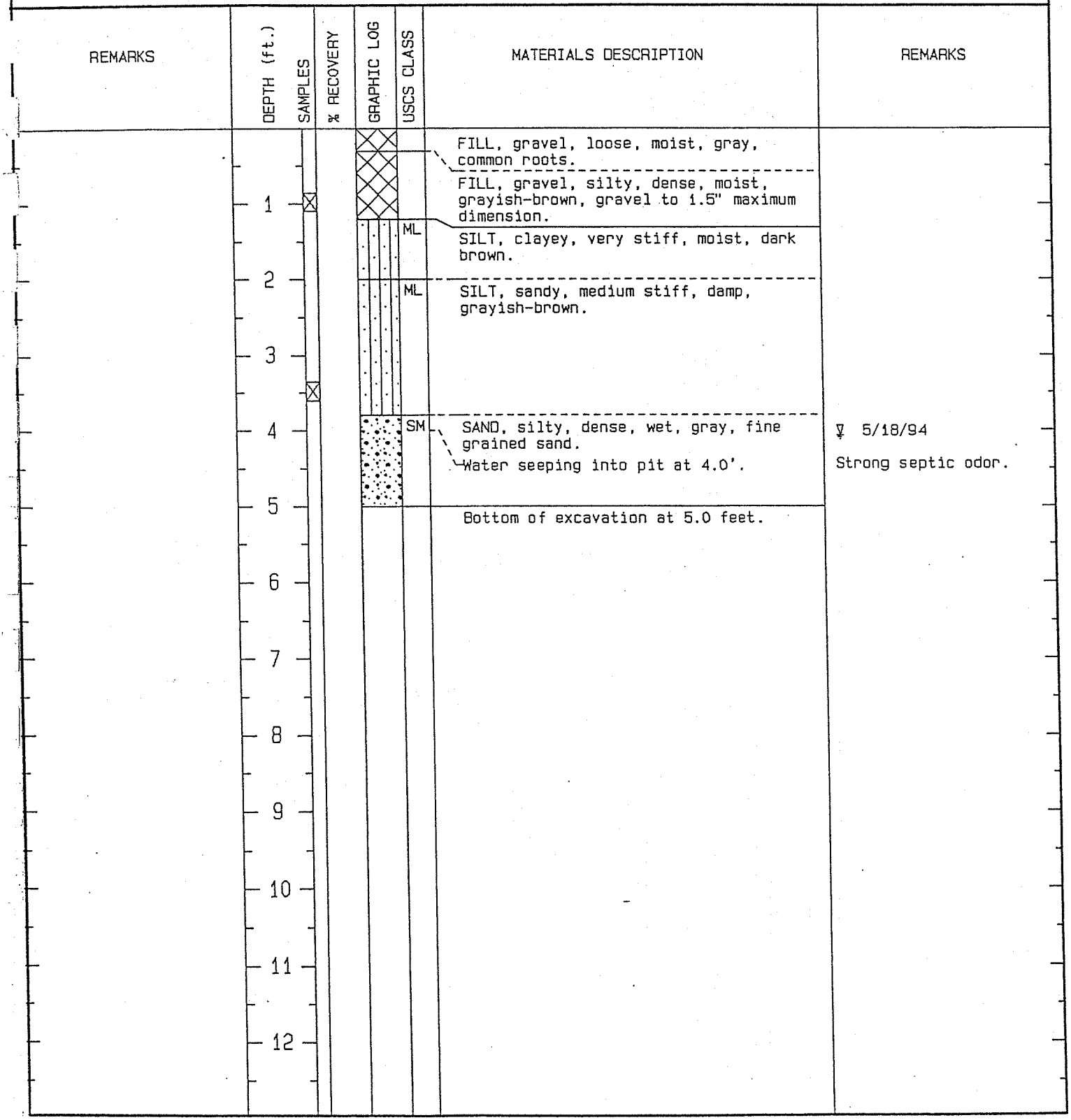
PROJECT North Coast Exports
JOB NUMBER 930121.100
LOCATION Arcata, CA
DATE DRILLED 2/17/94
GROUND SURFACE ELEVATION
SAMPLER TYPE Hand sampled
EXCAVATION METHOD Backhoe
LOGGED BY BRD
TOTAL DEPTH OF HOLE 6.0ft.

REMARKS	DEPTH (ft.)	SAMPLES	% RECOVERY	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	REMARKS
	0					FILL, gravel, sandy, slightly clayey, medium dense, very moist, brown.	
	1					FILL, sand, well graded, very clayey, silty, gravelly, organic, rounded and angular gravel and cobbles to 4" maximum dimension, wood debris to ≈1/4" in size.	
	2						
	3				ML	SILT, very clayey, slightly sandy, medium stiff, dark brown, fine grained sand.	
	4						
	5				SC	SAND, very fine, clayey, medium stiff, very moist, brown.	Petroleum odor from 5' to 6'.
	6				SC	SAND, coarse to fine, very clayey, medium stiff, very moist, brown.	▽ 2/17/94
						Bottom of excavation at 6.0 feet.	
	7						
	8						
	9						
	10						
	11						
	12						

APPENDIX V

HOLE NUMBER TP-17

PROJECT North Coast Exports
JOB NUMBER 930121.100
LOCATION Arcata, CA
DATE DRILLED 5/18/94
GROUND SURFACE ELEVATION
SAMPLER TYPE Hand sampled
EXCAVATION METHOD Backhoe
LOGGED BY DRW
TOTAL DEPTH OF HOLE 5.0ft.



APPENDIX V

HOLE NUMBER TP-15

PROJECT North Coast Exports
JOB NUMBER 930121.100
LOCATION Arcata, CA
DATE DRILLED 5/18/94
GROUND SURFACE ELEVATION
SAMPLER TYPE Hand sampled
EXCAVATION METHOD Backhoe
LOGGED BY DRW
TOTAL DEPTH OF HOLE 4.9ft.

REMARKS	DEPTH (ft.)	SAMPLES	% RECOVERY	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	REMARKS
	1					Fill, silt, gravelly, clayey, soft, moist, grayish-brown, common roots.	Asphalt pavement on west end of pit ≈5" thick.
						FILL, gravel, silty, loose, moist, grayish-brown.	
	2					FILL, wood debris, gravel, silty.	
	3				CL	CLAY, very silty, very stiff, moist, dark brown mottled red.	▽ 5/18/94 Water seeping from bottom of fill at west end of pit.
					ML	SILT, clayey, stiff, moist, dark brown.	
	4				ML	SILT, very clayey, stiff, moist, dark brown mottled reddish-brown.	Mottling increases with depth.
	5					Bottom of excavation at 4.9 feet.	
	6						
	7						
	8						
	9						
	10						
	11						
	12						

APPENDIX V

HOLE NUMBER TP-13

PROJECT North Coast Exports
LOCATION Arcata, CA
GROUND SURFACE ELEVATION
EXCAVATION METHOD Backhoe
LOGGED BY DRW

JOB NUMBER 930121.100
DATE DRILLED 5/18/94
SAMPLER TYPE Hand sampled
TOTAL DEPTH OF HOLE 5.5ft.

REMARKS	DEPTH (ft.)	SAMPLES	% RECOVERY	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	REMARKS
	1					FILL, silty, moist, dark brown, minor gravel, common roots.	
						FILL, gravel, silty, clayey, medium dense, moist, grayish-brown, gravel to 3" maximum dimension.	
	2					FILL, composted wood, charcoal, sandy, clayey, steel cable.	
					CL	CLAY, silty, stiff, moist, dark brown.	
	3						
	4						
	5						
						Bottom of excavation at 5.5 feet. No free groundwater encountered.	
	6						
	7						
	8						
	9						
	10						
	11						
	12						

APPENDIX V

HOLE NUMBER TP-11

PROJECT North Coast Exports
JOB NUMBER 930121.100
LOCATION Arcata, CA
DATE DRILLED 5/18/94
GROUND SURFACE ELEVATION
SAMPLER TYPE Hand sampled
EXCAVATION METHOD Backhoe
LOGGED BY DRW
TOTAL DEPTH OF HOLE 4.6ft.

REMARKS	DEPTH (ft.)	SAMPLES	% RECOVERY	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	REMARKS
	0					FILL, silt, gravelly, soft, moist, dark brown, common roots.	
	1					FILL, gravel, sandy, silty, wet, grayish-brown.	
	2					FILL, wood debris, wet.	Strong organic odor.
	3				CL	CLAY, silty, very stiff, moist.	
	4				ML	SILT, sandy, clayey, stiff, moist.	
	5					Bottom of excavation at 4.6 feet. No free groundwater encountered.	
	6						
	7						
	8						
	9						
	10						
	11						
	12						

APPENDIX V

HOLE NUMBER TP-9

PROJECT North Coast Exports
LOCATION Arcata, CA
GROUND SURFACE ELEVATION
EXCAVATION METHOD Backhoe
LOGGED BY DRW

JOB NUMBER 930121.100
DATE DRILLED 5/18/94
SAMPLER TYPE Hand sampled
TOTAL DEPTH OF HOLE 5.0ft.

REMARKS	DEPTH (ft.)	SAMPLES	% RECOVERY	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	REMARKS
	0					FILL, silt, soft, moist, dark brown, common roots.	
						FILL, gravel, silty, sandy, moist, grayish-brown.	
	1				ML	SILT, clayey, very stiff, moist, dark brown mottled reddish-brown.	
	2						
	3						
					SM	SAND, very silty, clayey, dense, moist, grayish-brown.	
	4						
	5					Bottom of excavation at 5.0 feet. No free groundwater encountered.	
	6						
	7						
	8						
	9						
	10						
	11						
	12						

APPENDIX V

HOLE NUMBER TP-7

PROJECT North Coast Exports
LOCATION Arcata, CA
GROUND SURFACE ELEVATION
EXCAVATION METHOD Backhoe
LOGGED BY DRW

JOB NUMBER 930121.100
DATE DRILLED 5/18/94
SAMPLER TYPE Hand sampled
TOTAL DEPTH OF HOLE 5.5ft.

REMARKS	DEPTH (ft.)	SAMPLES	% RECOVERY	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	REMARKS
	1					FILL, silt, clayey, soft, moist, common roots.	
						FILL, gravel, silty, loose, moist, dark brown, with reddish-brown wood debris at east end of test pit.	
	2				ML	SILT, sandy, clayey, very stiff, moist, dark brown mottled yellowish-brown.	
	3						
	4				ML	SILT, sandy, stiff, moist, medium to dark brown.	
	5						
	6					Bottom of excavation at 5.5 feet. No free groundwater encountered.	
	7						
	8						
	9						
	10						
	11						
	12						

APPENDIX V

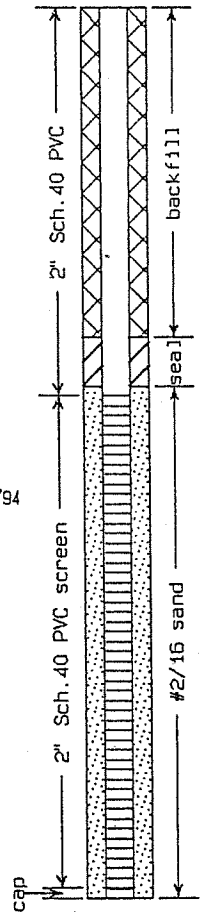
HOLE NUMBER TP-5 (BH-2)

PROJECT North Coast Exports
JOB NUMBER 930121.100
LOCATION Arcata, CA
DATE DRILLED 5/17/94
GROUND SURFACE ELEVATION 24.0ft.MSL
SAMPLER TYPE N/A
EXCAVATION METHOD Backhoe and Hand Auger
LOGGED BY JLA
TOTAL DEPTH OF HOLE 12.0ft.

REMARKS	DEPTH (ft.)	SAMPLES	BLOWS/6 in	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION
Elevations referenced to mean sea level (MSL) datum.	0					FILL, gravel, silty, dense, moist, dark brown, abundant wood debris (sawdust, bark).
	4				ML	SILT, sandy, medium stiff, moist, gray, fine to medium grained sand.
	7				ML	SILT, clayey, sandy, stiff, moist, gray to yellowish-brown variegated.
Bottom of borehole and test pit at 12.0 feet.	12					Bottom of excavation at 12.0 feet. Temporary piezometer was removed on 5/18/94. Resultant hole in bench was re-augered to remove filter pack materials, then backfilled with bentonite pellets.

Top of Casing Elev: 20.72 ft.

PIEZOMETER DIAGRAM



APPENDIX V

HOLE NUMBER TP-3

PROJECT North Coast Exports
LOCATION Arcata, CA
GROUND SURFACE ELEVATION
EXCAVATION METHOD Backhoe
LOGGED BY DRW

JOB NUMBER 930121.100
DATE DRILLED 5/17/94
SAMPLER TYPE Hand sampled
TOTAL DEPTH OF HOLE 6.0ft.

REMARKS	DEPTH (ft.)	SAMPLES	% RECOVERY	GRAPHIC LOG	USCS CLASS	MATERIALS DESCRIPTION	REMARKS
	0					FILL, gravel, sandy, loose, moist, gray, gravel to 4" maximum dimension, with wood debris and bark.	Fill to 1' at east end of test pit, to 1.5' at west end.
	1						
	2				CL	CLAY, silty, slightly sandy, medium stiff, moist, dark brown.	
	3						
	4				SM	SAND, very silty, clayey, dense, damp, dark brown. Water seeping into test pit.	▽ 5/17/94
	5						
	6					Bottom of excavation at 6.0 feet.	
	7						
	8						
	9						
	10						
	11						
	12						

Updated Hydraulic Analysis of Janes Creek

Foster Avenue Development ***June 21, 2005***

Prepared By: Domenichelli & Associates

Background

The Foster Avenue Development is to be located within the City of Arcata. The project area is bounded to the North by Single Family Homes, to the East by apartment buildings and Janes Creek, to the South by Foster Avenue, and to the West by open agricultural land. The project consists of a 43-acre master planned community.

As part of the Foster Avenue Development Project, improvements to the Lumberyard Road and Foster Avenue crossings are being made. The primary purpose of these improvements is to improve fish passage along Janes Creek. Foster Avenue will also be raise above the 100-year floodplain to accommodate emergency vehicular access.

The existing crossing at Foster Avenue is a 6-foot diameter corrugated metal pipe (CMP) culvert. The existing crossing at Lumberyard Road consists of a 7 foot wide by 4.2-foot high box culvert. The planned improvements will replace the existing culverts with CMP arch culverts. The County is concerned that the changes made at the Foster Avenue and Lumberyard Road crossings may affect flooding conditions at 17th Street (located downstream from the two crossings) and may create changes in floodplain elevations at and near the crossings.

The purpose of this analysis is to size the culverts and modify the Foster Avenue Roadway profile such that the affects on the floodplain are minimal, emergency vehicular access is provided and channel flows are essentially unchanged with the proposed improvements. Additionally the crossing at Foster Avenue must be raised to remove the road from the 100-year floodplain allowing access during a flood event. An alternative to install clear span bridges was also analyzed.

Methodology

In order to evaluate the hydraulic affects on 17th Street and the overall effects on the floodplain due to the proposed changes at Foster Avenue and Lumberyard Road, a HEC-RAS hydraulic model was developed for a section of Janes Creek through the project area. Typical creek cross sections surveyed between 17th Street and Foster Avenue were used along with cross sections taken from the project site survey between Foster Avenue and Lumberyard Road to develop the model. Survey information on each of the three crossings of interest was also used in the model. All survey information was provided by Kelly-O'Hern Associates.

Existing Conditions Model

To evaluate the affects of the road crossings an existing conditions model and a proposed condition model were developed. The existing model was originally calibrated to closely match the flood profiles developed by FEMA. This was achieved using the FEMA Flood Insurance Study flood flows and adjusting channel Manning's n-values until a similar water surface profile resulted. The overall composite calibration n-value was 0.04.

After further review of the channel and floodplain vegetative growth, the existing conditions model was re-run to best reflect existing conditions rather than attempting to match FEMA floodplain elevations. The existing creek banks have a considerable amount of brush and other vegetative growth. A view of Janes Creek near Foster Road is shown in Figure 1 below. A Manning's n-value of 0.03 was selected for the low flow channel and a value of 0.06 was selected for the overbanks to reflect the existing conditions.

Figure 1. View of Janes Creek downstream of Foster Ave crossing

A downstream water surface elevation from the FEMA flood profile was used as the downstream boundary condition below 17th Street for the 100-year flood profile. A 100-year flow rate of 1,030 cfs (from the FEMA FIS study) was used in the modeling efforts. In addition to the 100-year evaluation, hydraulic modeling for the 2-year, 10-year, 25-year and 50-year were also requested. The 10-year flow rate of 610 cfs and the 50-year flow rate of 920 cfs were taken from the FEMA FIS study. Additional flows for the 2-year (275 cfs) and 25-year (875 cfs) were extrapolated from a plot of the data. Boundary conditions for the 2-year, 10-year, 25-year and 50-year profiles were estimated using normal depth. Table 1 below summarizes the flow rates for each flood frequency analyzed.

Table 1. Flow rate summary

Flood Frequency	Peak Flow Rate (cfs)
2-year	275
10-year	610
25-year	875
50-year	920
100-year	1030

Existing Conditions Results

The project area lies within the City of Arcata, California in Humboldt County, FEMA Community Panel Number 060061 0002 E and 060060 0615 D. According to the current FEMA 100-year FIRM map and Flood Insurance Study (FIS) (dated November 5, 1997), both the Foster Avenue and Lumberyard Road crossings overtop during the 100-year flood event. The FEMA 100-year FIRM Map and flood profile for the project area are shown in Figure 2 and Figure 3.

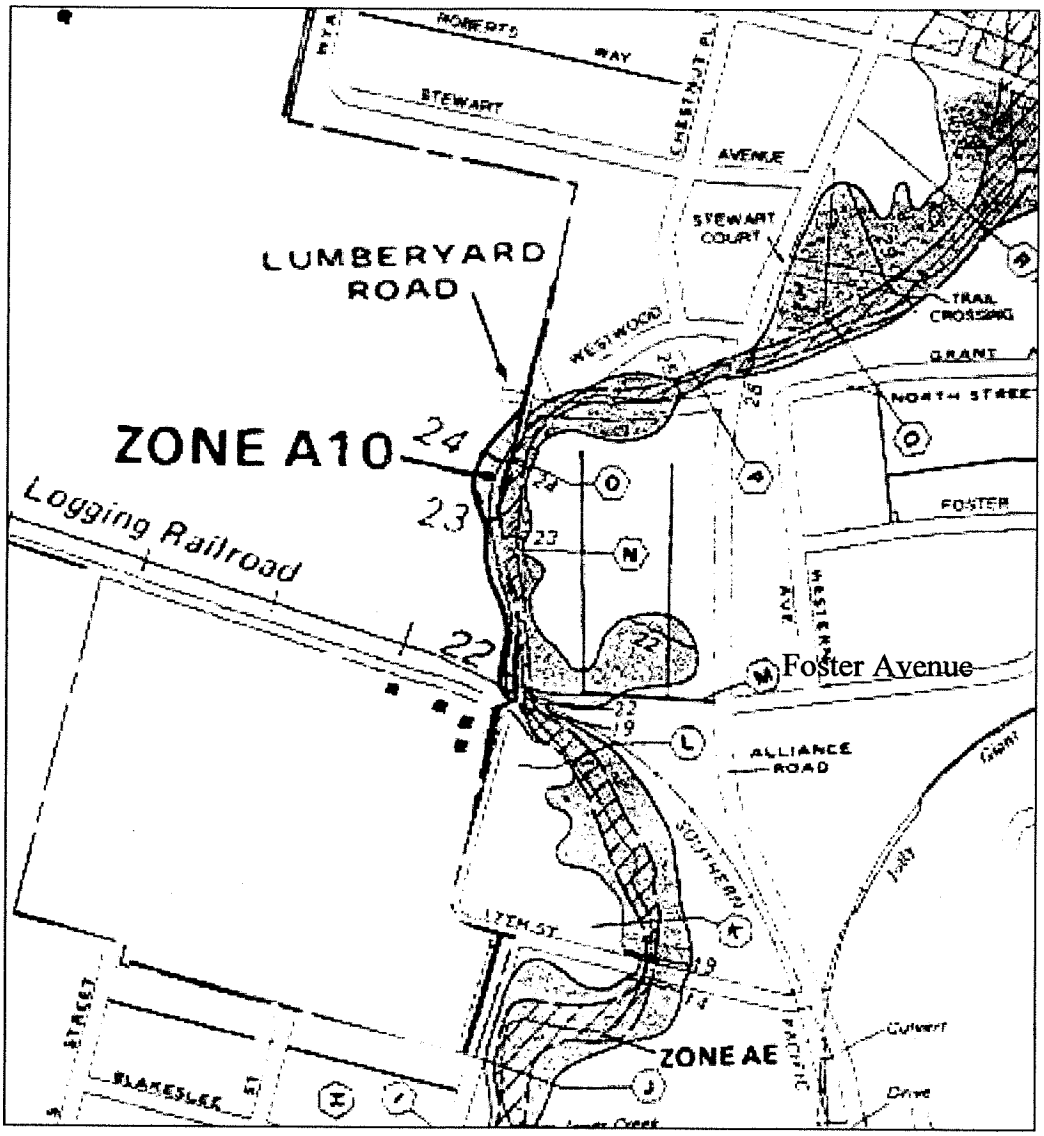


Figure 2. Section of FEMA County and City FIRM Map combined showing existing flooding conditions in the project area.

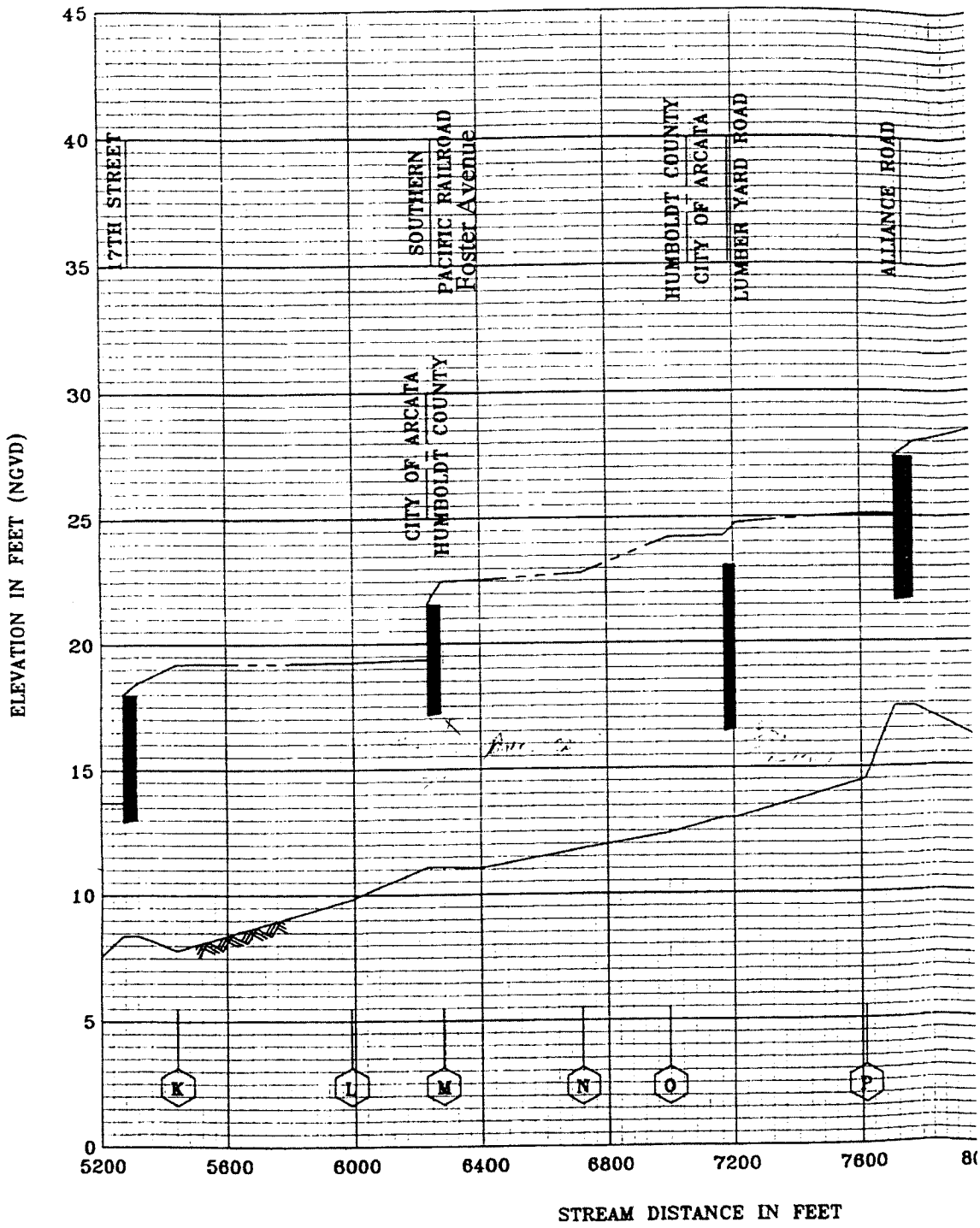


Figure 3. FEMA 100-year Flood Profile

An existing conditions profile from the HEC-RAS model is shown in Figure 4. While the HEC-RAS and the FEMA profile do not match exactly, they are similar (within approximately 0.3 feet). The model created from the surveyed data and observed Manning's roughness factors will provide a close approximation for the before and after comparison.

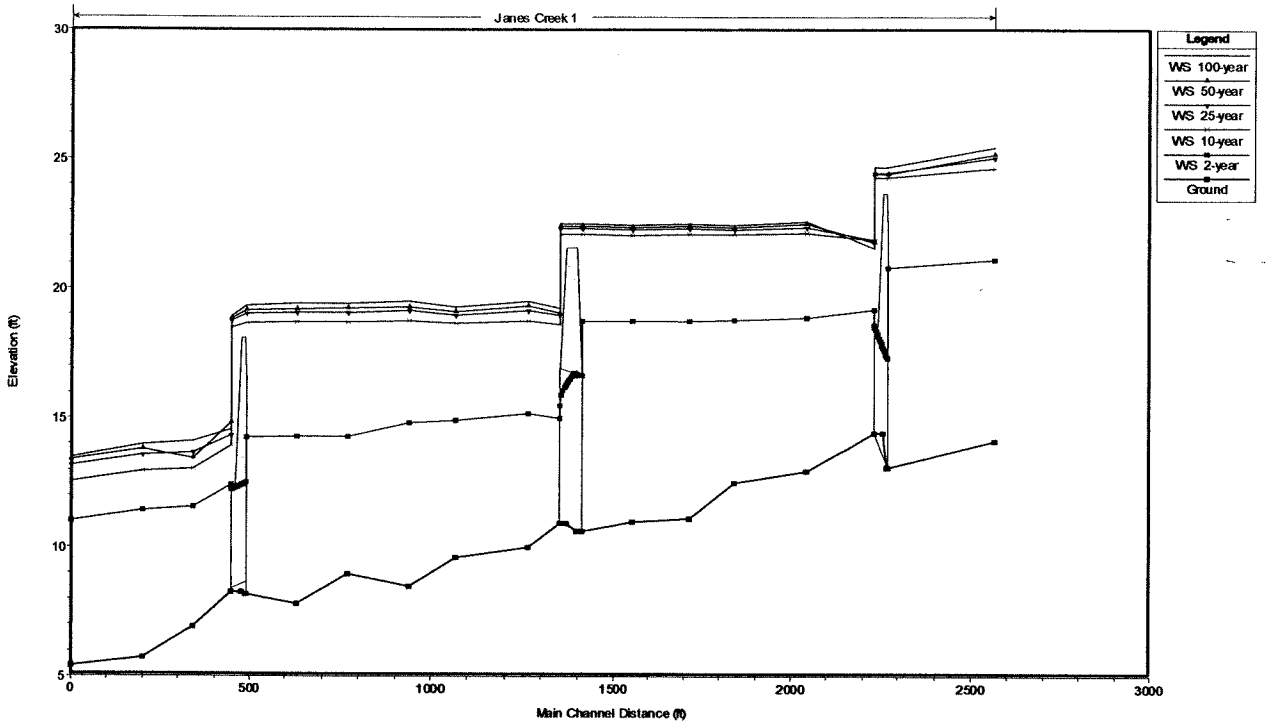


Figure 4. Existing conditions flood profile from HEC-RAS model

Table 2 below summarizes the existing condition water surface elevations and velocities for the 100-year and the 50-year flood profiles. The remaining run results for the 2-year, 10-year and 25-year can be found in the Appendix A of this report.

Table 2. Resulting Water Surface Elevations for the existing system model.

River Sta	Profile	Q Total (cfs)	W.S. Elev (ft)	Velocity (fps)
2562.75	100-year	1030	25.43	2.81
2562.75	50-year	920	25.16	2.64
2252.9 Lumberyard Road				
2043.05	100-year	1030	22.57	5.19
2043.05	50-year	920	22.46	4.74
1553.05	100-year	1030	22.44	2.74
1553.05	50-year	920	22.35	2.48
1384.35 Foster Avenue				
1265.65	100-year	1030	19.52	6.88
1265.65	50-year	920	19.36	6.34
630.65	100-year	1030	19.4	2.68
630.65	50-year	920	19.25	2.48
470.325 17th Street				
340	100-year	1030	14.1	9.95
340	50-year	920	13.46	11.53

0	100-year	1030	13.5	6.97
0	50-year	920	13.4	6.45

Proposed Hydraulic Conditions

For the proposed condition, the existing culvert crossings at Foster Avenue and Lumberyard Road were replaced with arch-type CMP culverts and additional concrete box culverts when necessary. The culverts were sized to minimize the affects on the floodplain elevations in the vicinity of the crossings. While the existing survey shows a negative slope at the culvert crossings (most likely caused by sediment deposition), in the proposed condition model the culverts are given a flat slope to reflect probable conditions after installation. Additionally, an option of a clear span bridge was also modeled.

In order to reflect a range of future conditions in the creek a sensitivity analysis was performed with a range Manning's n-values. The channel Manning's n-value was left at 0.03 to reflect future conditions within the low flow channel that will not vary significantly from the existing conditions. The overbank Manning's n-value were varied from 0.04 (to reflect a more cleared condition) to 0.08 (to reflect a more overgrown condition). Each of these models were then compared to the existing conditions model.

Proposed Conditions Model Results

The optimum configuration of culverts necessary at the Foster Road crossing was determined to be an arch with a span of 8 feet and a rise of 6 feet (at the bottom of the creek) with double box culverts 14 feet in width and 4 feet in height with an invert elevation of 18.8 feet. These culvert sizes will cause a slight decrease in water surface elevation upstream of Foster Road at the 100-year flow. The culverts are located at different elevations to provide a greater capacity during the larger events while minimizing the effects on the overall floodplain elevations. The road was raised to an elevation of 24 feet to take the road out of the 100-year floodplain. A cross section of the crossing at Foster Road and the proposed configuration of culverts is shown in Figure 6 below.

The optimum size culvert necessary at Lumberyard Road was determined to be an arch with a span of 10 feet and a rise of 5 feet. Again, this will cause a slight decrease in water surface elevation upstream of Lumberyard Road. The decrease in water surface elevation at the 100-year flow occurs in the direct vicinity of each crossing and is approximately 0.02 feet lower at Foster Avenue and 0.15 foot at Lumberyard Road. The resulting water surface profiles are shown below.

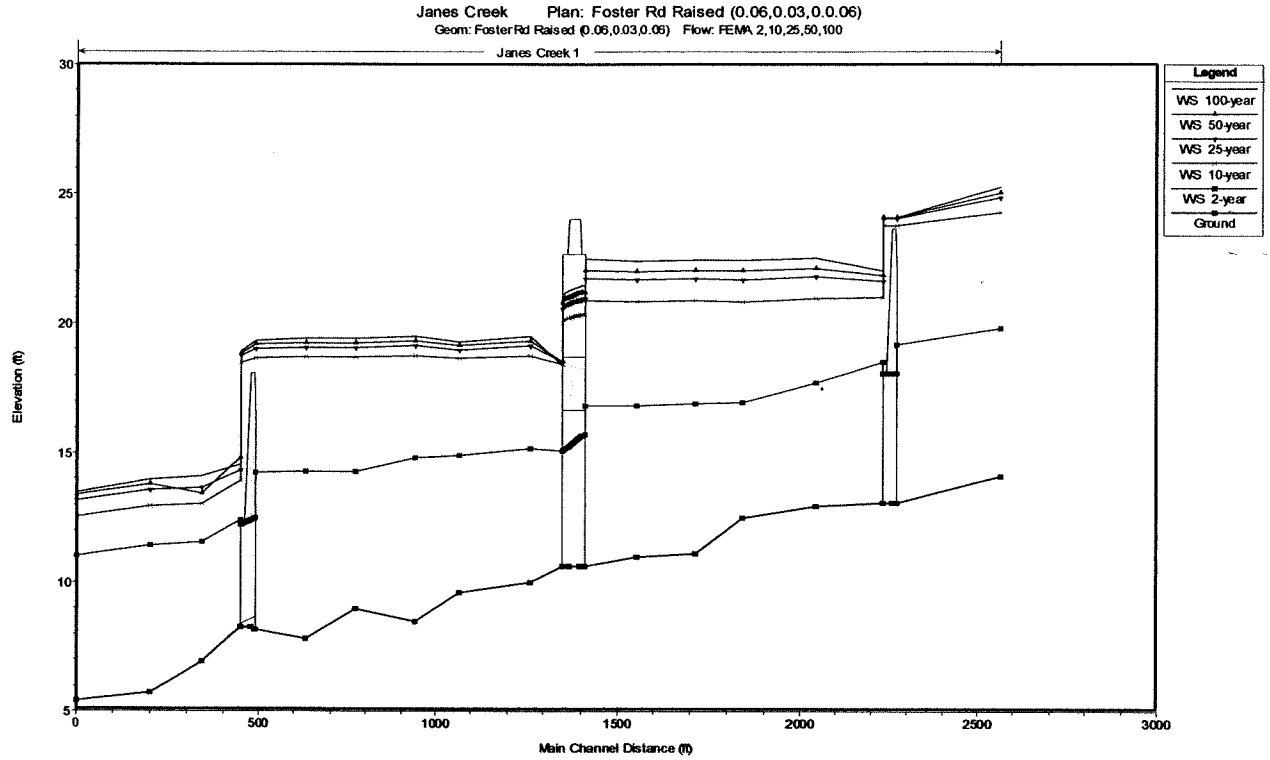


Figure 5. Resulting (proposed condition) Water Surface Profile

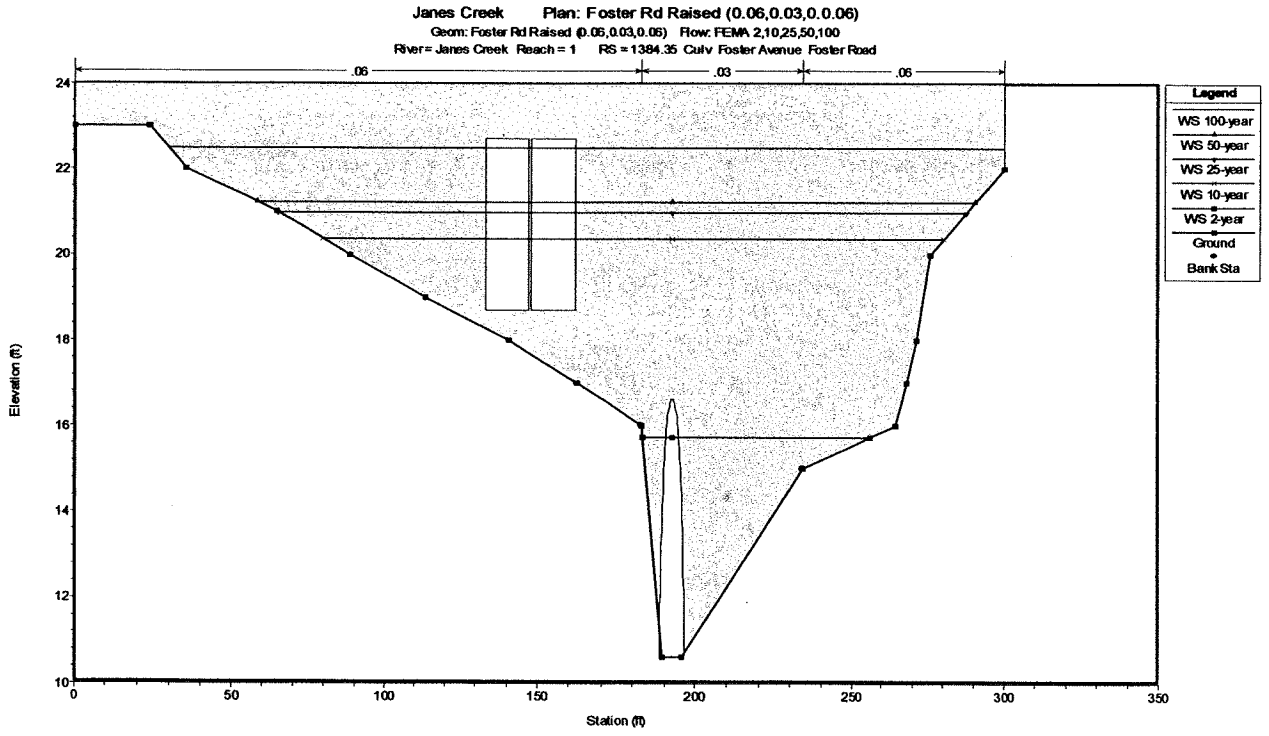


Figure 6. Proposed culverts at Foster Ave.

Proposed vs. Existing Conditions

The following table shows the difference in water surface elevations from the proposed condition to the existing condition for the 100-year, 50-year and 10-year flood profiles using Manning's n-values of (0.06, 0.03, 0.06). The remaining run results for the 2-year and 25-year and results for the other Manning's n-values modeled can be found in the Appendix A of this report. The differences between the water surface elevations under the varying n-value conditions is within a tenth of an foot. The largest difference occurs when the Manning's n-value was lowered to 0.04 in the overbanks to reflect a cleared condition. To minimize the affects of the changes the overbanks should be maintained as close to existing conditions as possible.

Table 3. Resulting water surface elevations for the proposed culverts

River Sta	Profile	Q Total (cfs)	DIFF WSE (ft)
Manning's N-values		**(0.06,0.03,0.06)**	
2562.75	100-year	1030	-0.15
2562.75	50-year	920	-0.1
2562.75	10-year	610	-0.35
2252.9	Lumberyard Road		
2043.05	100-year	1030	-0.02
2043.05	50-year	920	-0.3
2043.05	10-year	610	-1.15
1553.05	100-year	1030	-0.01
1553.05	50-year	920	-0.33
1553.05	10-year	610	-1.22
1384.35	Foster Avenue		
1265.65	100-year	1030	0
1265.65	50-year	920	-0.02
1265.65	10-year	610	0
630.65	100-year	1030	0
630.65	50-year	920	-0.02
630.65	10-year	610	0
470.325	17th Street		
340	100-year	1030	0
340	50-year	920	0
340	10-year	610	0
0	100-year	1030	0
0	50-year	920	0
0	10-year	610	0

Table 4 below shows the changes in velocity for the proposed culverts using various Manning's n-values for the 100-year, 50-year and 10-year profiles. The remaining run results for the 2-year

and 25-year and results for the other Manning's n-values modeled can be found in the Appendix A of this report. As can be seen the differences in velocity are minimal at the higher flows.

Table 4. Resulting velocities for the proposed culverts using a range of Manning's n-values

River Sta	Profile	Q Total (cfs)	DIFF VEL (ft/sec)
Manning's N-values		**(0.06,0.03,0.06)**	
2562.75	100-year	1030	0.08
2562.75	50-year	920	0.05
2562.75	10-year	610	0.15
2252.9	Lumberyard Road		
2043.05	100-year	1030	0.01
2043.05	50-year	920	0.31
2043.05	10-year	610	1.04
1553.05	100-year	1030	0
1553.05	50-year	920	0.14
1553.05	10-year	610	0.43
1384.35	Foster Avenue		
1265.65	100-year	1030	0
1265.65	50-year	920	0.02
1265.65	10-year	610	0
630.65	100-year	1030	0
630.65	50-year	920	0
630.65	10-year	610	0
470.325	17th Street		
340	100-year	1030	0
340	50-year	920	0
340	10-year	610	0
0	100-year	1030	0
0	50-year	920	0
0	10-year	610	0

The proposed changes at each of the crossings (Foster Road and Lumberyard Road) had no affect on the water surface elevation at 17th Street. The water surface elevation at 17th Street is controlled only by downstream structures. In order for upstream features to change the profile at 17th Street, a change in flow rate would have to occur. Based on the results of the before and after improvements analysis the flood levels match closely and therefore there will not be a measurable change in associated flow rates.

For the lower flows (2-year and below) water surface elevations are lower with the new culverts due to the wider cross section at the bottom of the arches. In either case the flow is contained within the channel. The results for the 2-year profile can be found in Appendix A.

Clear Span Bridge Results

The option of replacing the existing culverts with clear span bridges resulted in raising the water surface profile by approximately 0.5 feet for the 100-year flood profile upstream of the Lumberyard crossing and lowering the water surface elevation by approximately 1 foot through the project reach upstream of Foster Avenue. These are significantly greater differences than the arch culvert option and may result in measurable changes in the flow rate at 17th Street. Tables 5 and 6 below show the differences in water surface elevation and velocity for the 100-year, 50-year and 10-year profiles using a Manning's n-values of (0.06, 0.03, 0.06). The remaining run results for the 2-year and 25-year and results for the other Manning's n-values modeled can be found in the Appendix A of this report. The resulting profile using the existing system Manning's n-values (0.06, 0.03, 0.06) is shown below.

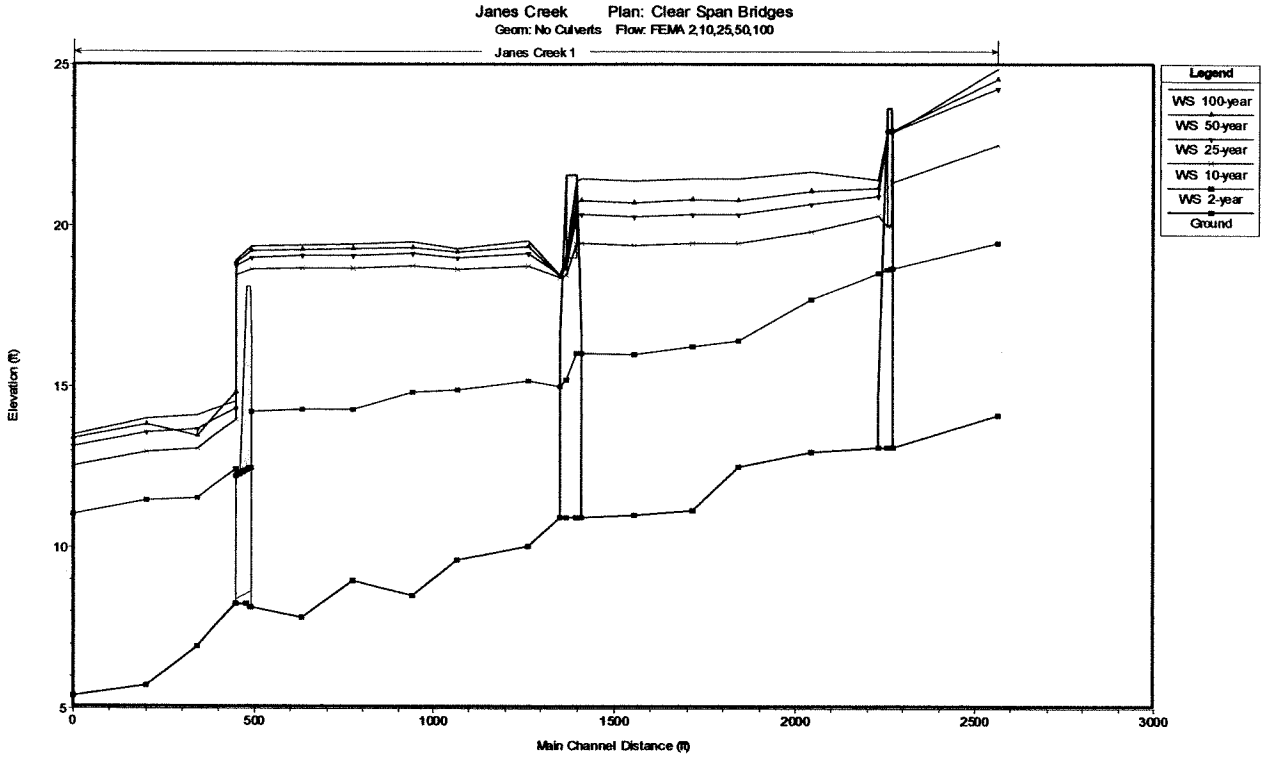


Figure 7. Clear Span Bridge Option

Table 5. Resulting water surface elevations for the clear span bridge option using a range of Manning's n-values

River Sta	Profile	Q Total (cfs)	DIFF WSE (ft)
Manning's N-values		**(0.06,0.03,0.06)**	
2562.75	100-year	1030	-0.56
2562.75	50-year	920	-0.61
2562.75	10-year	610	-2.16
2252.9	Lumberyard Road		
2043.05	100-year	1030	-0.9
2043.05	50-year	920	-1.38
2043.05	10-year	610	-2.32
1553.05	100-year	1030	-1.05
1553.05	50-year	920	-1.62
1553.05	10-year	610	-2.67
1384.35	Foster Avenue		
1265.65	100-year	1030	0
1265.65	50-year	920	0
1265.65	10-year	610	0
630.65	100-year	1030	0
630.65	50-year	920	0.01
630.65	10-year	610	0
470.325	17th Street		
340	100-year	1030	0
340	50-year	920	0
340	10-year	610	0
0	100-year	1030	0
0	50-year	920	0
0	10-year	610	0

Table 6. Resulting velocities for the clear span bridge option using a range of Manning's n-values

River Sta	Profile	Q Total (cfs)	DIFF VEL (ft/sec)
Manning's N-values		**(0.06,0.03,0.06)**	
2562.75	100-year	1030	0.32
2562.75	50-year	920	0.34
2562.75	10-year	610	1.21
2252.9	Lumberyard Road		
2043.05	100-year	1030	1.13
2043.05	50-year	920	1.76
2043.05	10-year	610	2.7

1553.05	100-year	1030	0.55
1553.05	50-year	920	0.85
1553.05	10-year	610	1.19
1384.35	Foster Avenue		
1265.65	100-year	1030	0
1265.65	50-year	920	-0.01
1265.65	10-year	610	0
630.65	100-year	1030	0
630.65	50-year	920	-0.01
630.65	10-year	610	0
470.325	17th Street		
340	100-year	1030	0
340	50-year	920	0
340	10-year	610	0
0	100-year	1030	0
0	50-year	920	0
0	10-year	610	0

Conclusion

The proposed changes at the Lumberyard Road and Foster Avenue culvert crossings would result in minimal changes to the existing floodplain elevations. Changes in water surface elevation would occur only in the direct vicinity and upstream of the crossings. The proposed changes made at either the Lumberyard Road or the Foster Avenue crossing would have no affect on the 17th Street crossing.

Appendix A – Results for all Flood Profiles

Table A-1. Resulting Water Surface Elevations for the existing system model.

River Sta	Profile	Q Total (cfs)	W.S. Elev (ft)	Velocity (fps)
2562.75	100-year	1030	25.43	2.81
2562.75	50-year	920	25.16	2.64
2562.75	25-year	825	25.00	2.44
2562.75	10-year	610	24.65	1.93
2562.75	2-year	275	21.03	2.11
2252.9 Lumberyard Road				
2043.05	100-year	1030	22.57	5.19
2043.05	50-year	920	22.46	4.74
2043.05	25-year	825	22.37	4.33
2043.05	10-year	610	22.13	3.38
2043.05	2-year	275	18.89	3.67
1553.05	100-year	1030	22.44	2.74
1553.05	50-year	920	22.35	2.48
1553.05	25-year	825	22.28	2.25
1553.05	10-year	610	22.07	1.73
1553.05	2-year	275	18.75	1.54
1384.35 Foster Avenue				
1265.65	100-year	1030	19.52	6.88
1265.65	50-year	920	19.36	6.34
1265.65	25-year	825	19.16	5.91
1265.65	10-year	610	18.76	4.71
1265.65	2-year	275	15.16	4.7
630.65	100-year	1030	19.4	2.68
630.65	50-year	920	19.25	2.48
630.65	25-year	825	19.06	2.32
630.65	10-year	610	18.68	1.87
630.65	2-year	275	14.29	3.52
470.325 17th Street				
340	100-year	1030	14.1	9.95
340	50-year	920	13.46	11.53
340	25-year	825	13.67	9.49

340	10-year	610	13.06	9
340	2-year	275	11.55	7.13
0	100-year	1030	13.5	6.97
0	50-year	920	13.4	6.45
0	25-year	825	13.16	6.3
0	10-year	610	12.54	5.9
0	2-year	275	11.04	4.86

Table A-2. Resulting water surface elevations for the proposed culverts using a range of Manning's n-values

River Sta	Profile	Q Total (cfs)	EXISTING WSE (ft)	Proposed WSE (ft)	DIFF WSE (ft)	Proposed WSE (ft)	DIFF WSE (ft)	Proposed WSE (ft)	DIFF WSE (ft)
		Manning's N-values		**(0.06,0.03,0.06)**		**(0.08,0.03,0.08)**		**(0.04,0.03,0.04)**	
2562.75	100-year	1030	25.43	25.28	-0.15	25.3	-0.13	25.2	-0.23
2562.75	50-year	920	25.16	25.06	-0.1	25.08	-0.08	25.01	-0.15
2562.75	25-year	825	25	24.85	-0.15	24.87	-0.13	24.82	-0.18
2562.75	10-year	610	24.65	24.3	-0.35	24.32	-0.33	24.28	-0.37
2562.75	2-year	275	21.03	19.82	-1.21	19.82	-1.21	19.82	-1.21
2252.9	Lumberyard Road								
2043.05	100-year	1030	22.57	22.55	-0.02	22.6	0.03	22.49	-0.08
2043.05	50-year	920	22.46	22.16	-0.3	22.19	-0.27	22.14	-0.32
2043.05	25-year	825	22.37	21.83	-0.54	21.85	-0.52	21.79	-0.58
2043.05	10-year	610	22.13	20.98	-1.15	21	-1.13	20.97	-1.16
2043.05	2-year	275	18.89	17.73	-1.16	17.74	-1.15	17.71	-1.18
1553.05	100-year	1030	22.44	22.43	-0.01	22.48	0.04	22.36	-0.08
1553.05	50-year	920	22.35	22.02	-0.33	22.06	-0.29	22	-0.35
1553.05	25-year	825	22.28	21.69	-0.59	21.72	-0.56	21.66	-0.62
1553.05	10-year	610	22.07	20.85	-1.22	20.87	-1.2	20.83	-1.24
1553.05	2-year	275	18.75	16.81	-1.94	16.86	-1.89	16.74	-2.01
1384.35	Foster Avenue								
1265.65	100-year	1030	19.52	19.52	0	19.56	0.04	19.47	-0.05
1265.65	50-year	920	19.36	19.34	-0.02	19.38	0.02	19.32	-0.04
1265.65	25-year	825	19.16	19.16	0	19.19	0.03	19.12	-0.04
1265.65	10-year	610	18.76	18.76	0	18.78	0.02	18.73	-0.03
1265.65	2-year	275	15.16	15.16	0	15.22	0.06	15.07	-0.09
630.65	100-year	1030	19.4	19.4	0	19.39	-0.01	19.41	0.01
630.65	50-year	920	19.25	19.23	-0.02	19.22	-0.03	19.26	0.01
630.65	25-year	825	19.06	19.06	0	19.05	-0.01	19.06	0

630.65	10-year	610	18.68	18.68	0	18.68	0	18.69	0.01
630.65	2-year	275	14.29	14.29	0	14.27	-0.02	14.31	0.02
470.325	17th Street								
340	100-year	1030	14.1	14.1	0	14.1	0	14.1	0
340	50-year	920	13.46	13.46	0	13.46	0	13.46	0
340	25-year	825	13.67	13.67	0	13.67	0	13.67	0
340	10-year	610	13.06	13.06	0	13.06	0	13.06	0
340	2-year	275	11.55	11.55	0	11.55	0	11.55	0
0	100-year	1030	13.5	13.5	0	13.5	0	13.5	0
0	50-year	920	13.4	13.4	0	13.4	0	13.4	0
0	25-year	825	13.16	13.16	0	13.16	0	13.16	0
0	10-year	610	12.54	12.54	0	12.54	0	12.54	0
0	2-year	275	11.04	11.04	0	11.04	0	11.04	0

Table A-3. Resulting velocities for the proposed culverts using a range of Manning's n-values

River Sta	Profile	Q Total (cfs)	EXISTING VEL (fps)	Proposed VEL (fps)	DIFF VEL (fps)	Proposed VEL (fps)	DIFF VEL (fps)	Proposed VEL (fps)	DIFF VEL (fps)
		Manning's N-values		**(0.06,0.03,0.06)**		**(0.08,0.03,0.08)**		**(0.04,0.03,0.04)**	
2562.75	100-year	1030	2.81	2.89	0.08	2.87	0.06	2.93	0.12
2562.75	50-year	920	2.64	2.69	0.05	2.68	0.04	2.72	0.08
2562.75	25-year	825	2.44	2.51	0.07	2.51	0.07	2.53	0.09
2562.75	10-year	610	1.93	2.08	0.15	2.07	0.14	2.09	0.16
2562.75	2-year	275	2.11	3.14	1.03	3.14	1.03	3.14	1.03
2252.9	Lumberyard Road								
2043.05	100-year	1030	5.19	5.2	0.01	5.16	-0.03	5.27	0.08
2043.05	50-year	920	4.74	5.05	0.31	5.02	0.28	5.08	0.34
2043.05	25-year	825	4.33	4.88	0.55	4.85	0.52	4.92	0.59
2043.05	10-year	610	3.38	4.42	1.04	4.4	1.02	4.43	1.05
2043.05	2-year	275	3.67	5.73	2.06	5.7	2.03	5.76	2.09
1553.05	100-year	1030	2.74	2.74	0	2.72	-0.02	2.77	0.03
1553.05	50-year	920	2.48	2.62	0.14	2.6	0.12	2.63	0.15
1553.05	25-year	825	2.25	2.49	0.24	2.48	0.23	2.51	0.26
1553.05	10-year	610	1.73	2.16	0.43	2.15	0.42	2.16	0.43
1553.05	2-year	275	1.54	2.65	1.11	2.61	1.07	2.71	1.17
1384.35	Foster Avenue								
1265.65	100-year	1030	6.88	6.88	0	7.54	0.66	5.86	-1.02

1265.65	50-year	920	6.34	6.36	0.02	6.95	0.61	5.41	-0.93
1265.65	25-year	825	5.91	5.91	0	6.45	0.54	5.07	-0.84
1265.65	10-year	610	4.71	4.71	0	5.12	0.41	4.06	-0.65
1265.65	2-year	275	4.7	4.7	0	4.8	0.1	4.53	-0.17
630.65	100-year	1030	2.68	2.68	0	3.26	0.58	1.98	-0.7
630.65	50-year	920	2.48	2.48	0	3.01	0.53	1.83	-0.65
630.65	25-year	825	2.32	2.32	0	2.81	0.49	1.72	-0.6
630.65	10-year	610	1.87	1.87	0	2.25	0.38	1.4	-0.47
630.65	2-year	275	3.52	3.52	0	3.79	0.27	3.09	-0.43
470.325	17th Street								
340	100-year	1030	9.95	9.95	0	9.95	0	9.95	0
340	50-year	920	11.53	11.53	0	11.53	0	11.53	0
340	25-year	825	9.49	9.49	0	9.49	0	9.49	0
340	10-year	610	9	9	0	9	0	9	0
340	2-year	275	7.13	7.13	0	7.13	0	7.13	0
0	100-year	1030	6.97	6.97	0	6.97	0	6.97	0
0	50-year	920	6.45	6.45	0	6.45	0	6.45	0
0	25-year	825	6.3	6.3	0	6.3	0	6.3	0
0	10-year	610	5.9	5.9	0	5.9	0	5.9	0
0	2-year	275	4.86	4.86	0	4.86	0	4.86	0

Table A-4. Resulting water surface elevations for the clear span bridge option using a range of Manning's n-values

River Sta	Profile	Q Total (cfs)	EXISTING WSE (ft)	Proposed WSE (ft)	DIFF WSE (ft)	Proposed WSE (ft)	DIFF WSE (ft)	Proposed WSE (ft)	DIFF WSE (ft)
		Manning's N-values		**(0.06,0.03,0.06)**		**(0.08,0.03,0.08)**		**(0.04,0.03,0.04)**	
2562.75	100-year	1030	25.43	24.87	-0.56	24.84	-0.59	24.84	-0.59
2562.75	50-year	920	25.16	24.55	-0.61	24.53	-0.63	24.53	-0.63
2562.75	25-year	825	25	24.24	-0.76	24.22	-0.78	24.22	-0.78
2562.75	10-year	610	24.65	22.49	-2.16	22.48	-2.17	22.47	-2.18
2562.75	2-year	275	21.03	19.46	-1.57	19.46	-1.57	19.46	-1.57
2252.9	Lumberyard Road								
2043.05	100-year	1030	22.57	21.67	-0.9	21.3	-1.27	21.47	-1.1
2043.05	50-year	920	22.46	21.08	-1.38	20.92	-1.54	20.94	-1.52
2043.05	25-year	825	22.37	20.67	-1.7	20.56	-1.81	20.54	-1.83
2043.05	10-year	610	22.13	19.81	-2.32	19.78	-2.35	19.73	-2.4
2043.05	2-year	275	18.89	17.73	-1.16	17.72	-1.17	17.74	-1.15
1553.05	100-year	1030	22.44	21.39	-1.05	20.91	-1.53	21.14	-1.3

1553.05	50-year	920	22.35	20.73	-1.62	20.5	-1.85	20.54	-1.81
1553.05	25-year	825	22.28	20.28	-2	20.13	-2.15	20.09	-2.19
1553.05	10-year	610	22.07	19.4	-2.67	19.35	-2.72	19.27	-2.8
1553.05	2-year	275	18.75	16.01	-2.74	16.07	-2.68	15.95	-2.8
1384.35	Foster Avenue								
1265.65	100-year	1030	19.52	19.52	0	19.56	0.04	19.47	-0.05
1265.65	50-year	920	19.36	19.36	0	19.39	0.03	19.32	-0.04
1265.65	25-year	825	19.16	19.16	0	19.19	0.03	19.12	-0.04
1265.65	10-year	610	18.76	18.76	0	18.78	0.02	18.73	-0.03
1265.65	2-year	275	15.16	15.16	0	15.22	0.06	15.07	-0.09
630.65	100-year	1030	19.4	19.4	0	19.39	-0.01	19.41	0.01
630.65	50-year	920	19.25	19.26	0.01	19.25	0	19.26	0.01
630.65	25-year	825	19.06	19.06	0	19.05	-0.01	19.06	0
630.65	10-year	610	18.68	18.68	0	18.68	0	18.69	0.01
630.65	2-year	275	14.29	14.29	0	14.27	-0.02	14.31	0.02
470.325	17th Street								
340	100-year	1030	14.1	14.1	0	14.1	0	14.1	0
340	50-year	920	13.46	13.46	0	13.46	0	13.46	0
340	25-year	825	13.67	13.67	0	13.67	0	13.67	0
340	10-year	610	13.06	13.06	0	13.06	0	13.06	0
340	2-year	275	11.55	11.55	0	11.55	0	11.55	0
0	100-year	1030	13.5	13.5	0	13.5	0	13.5	0
0	50-year	920	13.4	13.4	0	13.4	0	13.4	0
0	25-year	825	13.16	13.16	0	13.16	0	13.16	0
0	10-year	610	12.54	12.54	0	12.54	0	12.54	0
0	2-year	275	11.04	11.04	0	11.04	0	11.04	0

Table A-5. Resulting velocities for the clear span bridge option using a range of Manning's n-values

River Sta	Profile	Q Total (cfs)	EXISTING VEL (fps)	Proposed VEL (fps)	DIFF VEL (fps)	Proposed VEL (fps)	DIFF VEL (fps)	Proposed VEL (fps)	DIFF VEL (fps)
	Manning's N-values			**(0.06,0.03,0.06)**		**(0.08,0.03,0.08)**		**(0.04,0.03,0.04)**	
2562.75	100-year	1030	2.81	3.13	0.32	3.15	0.34	3.15	0.34
2562.75	50-year	920	2.64	2.98	0.34	2.99	0.35	2.99	0.35
2562.75	25-year	825	2.44	2.85	0.41	2.86	0.42	2.87	0.43
2562.75	10-year	610	1.93	3.14	1.21	3.15	1.22	3.16	1.23
2562.75	2-year	275	2.11	3.6	1.49	3.6	1.49	3.6	1.49
2252.9	Lumberyard Road								

2043.05	100-year	1030	5.19	6.32	1.13	6.9	1.71	6.61	1.42
2043.05	50-year	920	4.74	6.5	1.76	6.77	2.03	6.73	1.99
2043.05	25-year	825	4.33	6.48	2.15	6.67	2.34	6.7	2.37
2043.05	10-year	610	3.38	6.08	2.7	6.14	2.76	6.23	2.85
2043.05	2-year	275	3.67	5.72	2.05	5.74	2.07	5.7	2.03
1553.05	100-year	1030	2.74	3.29	0.55	3.6	0.86	3.44	0.7
1553.05	50-year	920	2.48	3.33	0.85	3.48	1	3.46	0.98
1553.05	25-year	825	2.25	3.27	1.02	3.38	1.13	3.4	1.15
1553.05	10-year	610	1.73	2.92	1.19	2.96	1.23	3.01	1.28
1553.05	2-year	275	1.54	3.5	1.96	3.43	1.89	3.58	2.04
1384.35	Foster Avenue								
1265.65	100-year	1030	6.88	6.88	0	7.54	0.66	5.86	-1.02
1265.65	50-year	920	6.34	6.33	-0.01	6.93	0.59	5.41	-0.93
1265.65	25-year	825	5.91	5.91	0	6.45	0.54	5.07	-0.84
1265.65	10-year	610	4.71	4.71	0	5.12	0.41	4.06	-0.65
1265.65	2-year	275	4.7	4.7	0	4.8	0.1	4.53	-0.17
630.65	100-year	1030	2.68	2.68	0	3.26	0.58	1.98	-0.7
630.65	50-year	920	2.48	2.47	-0.01	3	0.52	1.83	-0.65
630.65	25-year	825	2.32	2.32	0	2.81	0.49	1.72	-0.6
630.65	10-year	610	1.87	1.87	0	2.25	0.38	1.4	-0.47
630.65	2-year	275	3.52	3.52	0	3.79	0.27	3.09	-0.43
470.325	17th Street								
340	100-year	1030	9.95	9.95	0	9.95	0	9.95	0
340	50-year	920	11.53	11.53	0	11.53	0	11.53	0
340	25-year	825	9.49	9.49	0	9.49	0	9.49	0
340	10-year	610	9	9	0	9	0	9	0
340	2-year	275	7.13	7.12	-0.01	7.12	-0.01	7.12	-0.01
0	100-year	1030	6.97	6.97	0	6.97	0	6.97	0
0	50-year	920	6.45	6.45	0	6.45	0	6.45	0
0	25-year	825	6.3	6.3	0	6.3	0	6.3	0
0	10-year	610	5.9	5.9	0	5.9	0	5.9	0
0	2-year	275	4.86	4.86	0	4.86	0	4.86	0

APPENDIX X

Stormwater Management Assessment

Creekside Homes
Arcata, California

Prepared for:

Danco Communities

November 2018
016071

Reference: 016071

Stormwater Management Assessment

Creekside Homes

Arcata, California

Prepared for:
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November 2018

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INTRODUCTION

The 15.94-acre property at 2000 Foster Avenue, designated Assessor's Parcel Number (APN) 505-161-011, is slated for annexation into the City of Arcata in conjunction with development as a minor subdivision for three large residential lots (Appendix 1). Since the site is to be annexed into the City of Arcata, the new Municipal Separate Storm Sewer Systems (MS4) stormwater requirements will be applied to this project in accordance with the City's post-construction standards. Under the State MS4 Permit, this project qualifies as a Regulated Project (>5,000 ft^2 impermeable surface addition), as well as a hydromodification project (>1 ac. new impervious surface). The project will also be subject to the State Water Board's Construction General Permit (CGP). The MS4 requirements for this project will satisfy the CGP post-construction regulations. This document is an assessment of the potential for the proposed project to meet these stormwater standards.

BACKGROUND

With the adoption of the Phase II Small MS4 General Permit (Order No. 2013-0001 DWQ), effective since July 1, 2013, any development creating or replacing 5,000 ft^2 or more impermeable surface is subject to strict stormwater controls. Site visits for this project were performed by SHN/Streamline Planning Consultants stormwater specialists on July 15, July 16, August 24, October 9, and December 7, 2015, February 15, 2016, and March 27, 2018. During this time, hydrology, soils, vegetative cover, wetland, and stormwater conditions were assessed. Since the site lies on compacted fill from the previous mill condition, soils will need amending to retain and treat water onsite before discharge. Additional Best Management Practices (BMPs, called site design measures in MS4 terminology) are proposed to supplement onsite stormwater treatment, and to meet MS4 Permit requirements. These requirements include capturing the 85th percentile storm event volume of 0.65 inches, through self-retention and low impact development (LID) site design measures, along with the hydromodification requirement of maintaining the pre-project site flow rate using 2.93 inches for the 2-year, 24-hour storm event.

STORMWATER SETTING AND SITE CONDITIONS

The project lies on a former mill site, with typical highly compacted, rocky fill soils showing poor infiltration capability. Approximately one acre lies on relatively undisturbed riparian habitat, while the remaining 14.95-acre parcel is covered with industrial fill typical to that observed on the majority of mill sites in the area. The south half of the eastern property line is bordered by Janes Creek, while the entire western border lies adjacent to an agricultural field. The site is elevated above the western field by several feet of fill. During wet-season site visits, it was noted that the southern agricultural fields to the west were inundated for extended periods. The northern half of these western fields were briefly examined, with an area lacking hydric soils or wetland hydrology confirmed along the northern-most hundred feet of these fields. This upland area will provide an emergency access road from the project site to Stewart Avenue.

As seen during periodic site visits, infiltration varies across the site, producing conditions from upland, where infiltration is good (as observed within the riparian corridor on native alluvial soils), to poorly-infiltrating wetland areas scattered across the site. These depressions classify as two- or three- parameter wetlands with negligible permeability. The majority of the site exhibited poor to moderately infiltrating soils, with the volume of rock and compaction so severe in many areas that one shovel was broken during field investigation, and tool refusal was met at several locations. These conditions will make soil amending an important component of this project's stormwater management.

NATURE OF PROJECT

Because this project is an urban development spread relatively uniformly across the site, a combination of BMPs will be interspersed throughout the project to meet current stormwater regulations. This assessment is based on the Proposed Site Plan (K. Boodjeh Architects, 2017) and the assumption that all stormwater will eventually flow toward the southeast, to ensure that stormwater regulations will be met. During final site design, BMPs can be adjusted, as needed, to fit the finished design and meet applicable regulations. Self-retaining Areas, Soil Amending, and Tree Planting are the three most flexible BMPs that can be adjusted depending on developer preference, cost analysis, and available space during final design. This analysis confirms that the proposed plan contains more than adequate space and BMPs to meet all MS4 requirements.

While debate has centered around the best way to handle MS4 requirements on multi-unit residential developments, impervious surface area distributed across the site mandates spreading BMPs throughout the site to meet the regulated project requirements. Six BMPs have been selected for application on individual lots, with Stream Setbacks and Buffers being employed as a seventh BMP on a portion of the southeastern project perimeter.

BMP RECOMMENDATIONS

A variety of BMPs are slated to diversify management and increase the effectiveness of stormwater detention and treatment for this project. Additionally, these BMPs will be spread throughout the site to reduce concentrated flows, rather than taking the historical end-of-pipe approach. Special emphasis has been placed on the use of stormwater treatment BMPs to pre-treat stormwater before it enters the wetland mitigation area, prior to entering Janes Creek. These BMPs, including soil quality improvement, vegetated swales, porous asphalt, and rain gardens, provide water quality treatment through improved stormwater infiltration, water detention, and microbiological uptake and treatment. The following BMPs will be utilized for this project, in combination as appropriate for each location:

1) Soil Quality Improvement and Maintenance – Soil quality improvement is one of the most practical post-construction BMPs, because it greatly increases stormwater infiltration, soil moisture retention capacity, and plant health, which increases evapotranspiration. Additionally, amending and aerating soil creates a more favorable environment for microbial populations and activity, which immensely increases microbial pollutant treatment capabilities, as well as tree and plant growth for providing additional pollutant treatment. Stormwater runoff reduction for this BMP equals the surface area amended. After application of 50 pounds of gypsum per 1,000 ft^2 and 80 pounds of dolomite lime per 1,000 ft^2, a typical eight-inch surface profile is tilled, followed by a four-inch lift of compost added and tilled in. This practice provides a 12-inch layer of permeable soil that fosters pollutant-treating microorganisms and water infiltration. All swales, soil quality, and self-retaining areas should be amended, with the exception of the Stream Buffer Area.

2) Tree Planting and Preservation – Trees provide significant increases in evaporative surfaces for precipitation, in addition to their ability to extract moisture from the soil through evapotranspiration. Furthermore, trees and other plants provide an environment in their rhizosphere that fosters pollutant removal and transformation. Evergreen trees qualify for a 200-square foot runoff reduction, while deciduous trees count for 100-square feet of reduction. Trees must be at least one-inch in diameter at breast height, with a four-foot height for evergreens and a six-foot height for deciduous trees. Since a large number of trees provides multiple stormwater quality benefits to urban development, 103 deciduous and 155 evergreen trees are proposed for installation throughout the site. Columnar evergreens should be considered for tight spaces.

3) Vegetated Swales – Vegetated swales are superior to piped or paved conveyances in that they slow water velocity, increase evaporation, foster infiltration, provide wildlife habitat, and increase stormwater treatment. Swales qualify for a 1:1 reduction similar to Soil Quality Improvement. Swales will be used in landscape strips along roads and along the western border of the wetland mitigation area. The ideal dimensions are a minimum five feet width, with a minimum 2-foot wide bottom, and 3:1 slopes. While vegetated swales are planned for this project, they were left out of the calculations to ensure an additional factor of safety for runoff management and Permit compliance. An approximate 5,700 ft^2 pretreatment swale is planned along the western length of the wetland mitigation area to provide a factor of safety for overflow coming from the project's site design measures. This swale's volume has been included in the hydromodification calculation.

4) PPPP (Alternative Engineered Hardscaping Surfaces) – This BMP counts for a 1:1 reduction similar to Soil Quality Improvement, which is critical on large projects. Porous Asphalt will be used on secondary roads, which include driveways for the Assisted Living Facility and Cottage Neighborhood, in the alley for the single-family units, and in several parking lots. An approximate 92,783 ft^2 of permeable paving is proposed for this project.

5) Stream Setbacks and Buffers – This BMP counts for a 1:1 reduction similar to Soil Quality Improvement. A significant Stream Buffer (100 feet from Janes Creek) will be employed east of the Memory Care facility, Assisted Living facility, and the Cottage Neighborhood. This BMP was not included in the MS4 calculations. However, the wetland mitigation area that will be constructed within the buffer will be used to meet the hydromodification requirement.

6) Rain Gardens (Self-retaining Areas) – To be used in the two largest landscaped areas of the Cottage Neighborhood, this development technique can take the runoff from an area up to 3.5 times the size of the self-retaining feature. Similar to the Soil Quality Improvement BMP, the soils on the self-retaining areas will be amended appropriately to ensure infiltration and stormwater treatment. This BMP will be employed to the maximum extent feasible to take advantage of the natural water treatment capabilities of the soil ecosystem.

REGULATED PROJECT COMPLIANCE DEMONSTRATION

The State MS4 Permit requires that all projects creating or replacing 5,000 ft^2 or more of impervious surface must meet the 85th percentile storm event runoff reduction value for the total post-project impervious surface area. For Humboldt County, the average value of 0.65 inches has been assigned, with only the Shelter Cove area having a different value. Meeting this requirement satisfies the Construction General Permit post-construction regulations.

To demonstrate compliance with current stormwater regulations, BMPs were selected from the Humboldt LID Stormwater Manual V2.0 and inserted into Regulated Projects Worksheet 2, based on current impervious surface area estimates (Appendix 2). To provide a factor of safety, an excess of BMPs were entered to reach an Impervious Surface Runoff Value Reduction of 123%. BMPs can be adjusted upon final site design to achieve the most effective, compliant site design.

To properly treat the stormwater created by this development, two self-retaining areas were employed at the Cottage Neighborhood with surface totals of 22,426 ft^2, which produce an equivalent runoff reduction credit of 78,491 ft^2. From this reduction credit value, BMPs are employed to deduct additional credits to achieve an approximate runoff volume that would match natural or pre-project conditions for the 85th percentile storm event (0.65 inches). Trees, Soil Quality, and Porous Asphalt were then employed, as outlined in Table 1. This table and Appendix 2 demonstrate Regulated Project compliance.

Table 1. Runoff Reduction Credits for Installed BMPs
Total Impervious Area 273,557 ft^2 = 14,758 ft^3 of runoff from impermeable surface

BMP	Size	Runoff Reduction Credit
Self-retaining Area	22,426 ft^2	-78,491 ft^2
New Trees	103 Deciduous, 155 Evergreen	-41,300 ft^2
Existing Trees	100 ft^2, 30 ft^2, 30 ft^2	-4,631 ft^2
Soil Quality	119,202 ft^2	-119,202 ft^2
Vegetated Swale	To be customized for final plan	NA ft^2
Porous Asphalt	92,783 ft^2	-92,783 ft^2
Total Runoff Reduction Credit		-336,408 ft^2
% Reduction in Impervious Surface Runoff Value		123%
Note: Runoff reduction credits ≠ total impervious area because some runoff is natural (Appendix 2).		

HYDROMODIFICATION COMPLIANCE DEMONSTRATION

To meet MS4 hydromodification requirements, projects creating one acre or more of impervious surface must maintain post-project runoff at or below pre-project flow rates for the 2-year, 24-hour storm event (2.93 inches). In other words, the post-project flow is compared with the pre-project flow, rather than determining total runoff from impermeable surfaces as done for the regulated project requirement. This can be done with self-retaining areas if the fine soil textural fraction is less than 50%. A site visit and soil analysis within the proposed wetland mitigation area on March 27, 2018 demonstrated that the average fine soil separates meet this requirement, as set forth in Section 5.8 of Part C in the Humboldt County LID Manual (Appendix 3). With 14,758 ft^3 of runoff from the 85th percentile storm event treated onsite under the regulated projects requirement, no additional measures are required, since the post-project condition will be an improvement over current conditions, as shown in the calculations below.

While the Regulated Project requirements consider BMPs specifically designed to reduce stormwater runoff, they overlook other improved surface conditions inherent to the proposed residential development. Hydromodification calculations employ engineering runoff coefficients that consider such overlooked site characteristics including overall flow length, evaporative surfaces, soil hydrological types, and surface cover types. Examples of these additional development features and site characteristics that will help reduce runoff are: 1) the transformation of compacted, rocky ground to lawn and landscape not included in the soil quality improvement calculation; 2) differences in surface cover types and their associated improvements in surface runoff reduction and infiltration (such as the difference between plant type, plant species, and mulch type), and; 3) differences in cover percentages (100% cover on a grassy swale compared to an interspersed shrub landscape). However, since unexpected underground or installation conditions can potentially lead to impaired detention conditions, a hydromodification calculation was performed based on a worst-case scenario, as presented below in the Final Hydromodification Volume section to provide confidence that the stormwater system will adequately detain and treat site runoff.

While an approximate 6.28 acres will be paved or roofed, a large streamside buffer will remain unpaved, and an approximate 7.5 acres of landscaped area will receive soil quality treatment, planting, or plant preservation, which will greatly improve the site over current conditions (dominantly compacted, rocky fill soil). Self-retaining areas around the Cottage Neighborhood will provide 22,426 ft^2 of detention and infiltration area. With the site soil textures meeting the fine-earth standard, the proposed wetland mitigation area will be used, with a pretreatment bioswale along the entire western edge of the mitigation

area, to protect the nearby stream, to amplify the pretreatment of the site design measures, and as an additional hydromodification safety measure. This wetland mitigation area will hold an approximate 53,762 ft^3 of runoff volume in addition to the water treated for the 85th percentile storm event.

With an average runoff C value of 0.72 across the site under current conditions, a composite runoff coefficient of 0.52 was determined for post-project conditions based on the 6.28 acres of paving/roof (coefficient 0.95), 2.13 acres of permeable paving (coefficient 0.40), 3.39 acres of lawn area (coefficient 0.22), and 4.14 acres of landscape (woodland/amended conditions: coefficient 0.19). There will be less runoff due to the land improvements of the project, when compared with pre-project conditions, using the soil improvement and tree planting BMPs, along with landscaping, to break up the soil and build soil structure. The volume calculations in Tables 4, 5, and 6 demonstrate that the project will produce a net decrease in stormwater runoff from the parcel.

Design Storm Intensity

Humboldt County uses the State Water Board's LID standard, which is the 85th percentile, 24-hour storm event. This event is 0.65 inches when using the State Board's Post Construction Water Balance Calculator for Woodley Island, Humboldt County, as well as the Humboldt County LID Manual. The additional stormwater runoff capture requirement necessary to meet the state MS4 hydromodification standard includes the 2-year, 24-hour storm event of 2.93 inches. Runoff volume for this requirement was calculated using a standard conversion of the runoff flow calculated from the Rational Equation, as well as the NRCS method for comparison.

Table 2. Design Storm Comparison

Source	Design Storm	Volume
Humboldt Co.	85th percentile, 24-hr	0.65 inches
Humboldt Co.	2-year, 24-hr	2.93 inches

Rational Method

The Rational Method has become the most commonly used equation for determining the runoff flow rate. This method is most useful for small urban watersheds lacking large storage features (Bengston, 2010). From this flow rate, the required storage volume was calculated. The first volume calculation method used was the City of Arcata's method which simply converts the flow rate, derived from the Rational Method, from cubic feet per second to total storage in cubic feet. The second method employed was the Runoff Solution used by the Natural Resources Conservation Service (NRCS, 1986).

The Rational Method equation is Q = CIA.

Where:

Q = Stormwater runoff flow, in cubic feet per second
C = Typical surface runoff coefficients, available from many sources
I = Rainfall intensity, in inches per hour
A = Surface Area, in acres

Both pre- and post-site conditions were analyzed to determine the net increase in runoff. Table 3 lists some typical runoff coefficients (C values) for use in the Rational Method calculation. Table 4 presents the surface types at the facility and their associated surface area and C values.

Table 3. Typical Runoff Coefficients (C values)

Land Use	C	Land Use	C
Business:		***Lawns:***	
Downtown areas	0.70 - 0.95	Sandy soil, flat, 2%	0.05 - 0.10
Neighborhood areas	0.50 - 0.70	Sandy soil, avg., 2-7%	0.10 - 0.15
		Sandy soil, steep, 7%	0.15 - 0.20
		Heavy soil, flat, 2%	0.13 - 0.17
		Heavy soil, avg., 2-7%	0.18 - 0.22
		Heavy soil, steep, 7%	0.25 - 0.35
Residential:		***Agricultural land:***	
		Bare packed soil	
		*Smooth	0.30 - 0.60
		*Rough	0.20 - 0.50
		Cultivated rows	
Single-family areas	0.30 - 0.50	*Heavy soil, no crop	0.30 - 0.60
Multi units, detached	0.40 - 0.60	*Heavy soil, with crop	0.20 - 0.50
Multi units, attached	0.60 - 0.75	*Sandy soil, no crop	0.20 - 0.40
Suburban	0.25 - 0.40	*Sandy soil, with crop	0.10 - 0.25
		Pasture	
		*Heavy soil	0.15 - 0.45
		*Sandy soil	0.05 - 0.25
		Woodlands	0.05 - 0.25
Industrial:		*Streets:*	
Light areas	0.50 - 0.80	Asphaltic	0.70 - 0.95
Heavy areas	0.60 - 0.90	Concrete	0.80 - 0.95
		Brick	0.70 - 0.85
Parks, cemeteries	0.10 - 0.25	Unimproved areas	0.10 - 0.30
Playgrounds	0.20 - 0.35	Drives and walks	0.75 - 0.85
Railroad yard areas	0.20 - 0.40	Roofs	0.75 - 0.95

Source: Mountain Empire Community College online C Value Table.

Table 4. Surfaces and Runoff Coefficients for Creekside Homes, 15.94 acres

Surface	Area (Acres)	Runoff Coefficients (C)	Weighted (C) Components
Pre-Development Conditions			
Roof	0	0.95	0
Pavement	0.28	0.95	0.017
Vegetated	1.27	0.20	0.016
Gravel Parking/Road	14.39	0.75	0.677
Weighted C Value	*15.94 ac total*		***0.72***
Post-Development Conditions			
Roof + Pavement	6.28	0.95	0.374
Permeable Pavement	2.13	0.40	0.053
Lawn, Heavy Soil	3.39	0.22	0.047
Woodland/Amended	4.14	0.19	0.049
Weighted C Value	*15.94 ac total*		***0.52***

Table 5, below, shows the stormwater flows for pre- and post-construction conditions using the weighted values from above. These weighted values consider the difference in permeable area between the two conditions. While pre-development conditions contain a lower "impermeable" surface area, post-development conditions reflect a greatly improved surface condition with the installation of engineered permeable pavement, amended soils, self-retaining areas, and bioswales. These improvements are designed to improve infiltration beyond the existing compacted, rocky condition.

Table 5. Pre- and Post-Construction Flows for 2-year, 24-hour storm event (2.93")

Parameter	Symbol	Value
Pre-Development Conditions		
Runoff Coefficient	C	0.72
Intensity (inches/hour)	I	0.122
Total Area (acres)	A	15.94
Runoff Flow	Q_{pre}	1.40 ft^3/second
Post-Development Conditions		
Runoff Coefficient	C	0.52
Intensity (inches/hour)	I	0.122
Total Area (acres)	A	15.94
Runoff Flow	Q_{post}	1.01 ft^3/second

Standard Conversion

Storage Volume (V_{st}) = Q_{pre} (60min/hr)(60sec/min)(24hrs) so V = 1.40 ft^3/second (60min/hr)(60sec/min)(24hrs) =120,960 ft^3 required to contain the total pre-construction flows. Storage Volume (V_{st}) = Q_{post} (60min/hr)(60sec/min)(24hrs) so V = 1.01 ft^3/second (60min/hr)(60sec/min)(24hrs) = 87,264 ft^3 required to contain the total post-construction flows.

This difference translates to a site improvement of 33,696 ft^3 of stormwater retained onsite, rather than generated by development (Table 6).

Natural Resources Conservation Service (NRCS) Runoff Calculation

Using a pre-project runoff curve number of 80, taken from the Table of Runoff Curve Numbers for Urban Areas found in the Texas DOT Hydraulic Design Manual (Texas, 2009 and Appendix C), the 2.93 inches of rainfall for the Humboldt County 2-year, 24-hour storm event was entered into the Solution of Runoff Equation (NRCS, 1986) to find the runoff depth of 1.19 inches. This depth was multiplied by the area of 15.94 acres to get 68,856 ft^3 of runoff volume.

Using a post-project runoff curve number of 75 from the same table, based on the addition of LID landscaping, the 2.93 inches of rainfall for the Humboldt County 2-year, 24-hour storm event was entered into the Solution of Runoff Equation (NRCS, 1986) to find the runoff depth of 0.95 inches. This depth was multiplied by the area of 15.94 acres to get 54,969 ft^3 of runoff volume. The difference between pre- and post-conditions translates to a net runoff reduction of 13,887 ft^3 onsite due to soil and surface improvements (Table 6).

Table 6. Hydromodification Runoff Volume

Method	Post-Development Flow	Storage Volume Required
Standard Conversion	2.93 inches/hour	-33,696 ft^3
NRCS Runoff Equation	2.93 inches/hour	-13,887 ft^3
Difference		-19,809 ft^3
Average		-23,792 ft^3

Final Hydromodification Volume

When the two hydromodification calculation results (standard and NRCS) are compared and averaged, an approximate stormwater runoff reduction of 23,792 ft^3 from the pre- to post-project condition results on this parcel due to soil and site design measures. The wetland mitigation area and associated pre-treatment bioswale will provide adequate contingency overflow protection for this project.

The MS4 Permit and associated hydromodification project requirements are relatively new standards, with few existing projects to model. To ensure an adequate level of safety for flood control and watershed protection on this project, the total post-construction 2-year, 24-hour storm event of 2.93 inches was calculated for the site based on an urban area runoff curve number of 80, and entered into the Solution of Runoff Equation (NRCS, 1986) to find the runoff depth of 1.19 inches. This depth was multiplied by the area of 15.94 acres to get 68,856 ft^3 of runoff volume. By subtracting the 14,758 ft^3 removed by the Regulated Project requirement LID measures, this leaves a total site post-project runoff value (as opposed to the difference between pre- and post-conditions) of 54,098 ft^3 of runoff to treat onsite for the 2-year event. Since the proposed wetland mitigation area will hold an approximate 53,762 ft^3 of runoff volume, along with an additional 5,700 ft^3 contained in the adjacent pretreatment bioswale, this site will exceed the hydro-modification requirement to protect the surrounding watershed with a total runoff capture of 59,462 ft^3.

CONCLUSION

This assessment sets forth a feasible BMP suite that will lead to both compliance and a functional development. While the square footage of individual surfaces and BMPs might fluctuate as part of final site design, the attached spreadsheet and above calculations demonstrate that adequate room exists to employ appropriate BMPs to meet MS4 requirements across the site. Additionally, the stormwater management scheme, including site design measures and the hydromodification system, have been overdesigned to ensure both MS4 and Construction General Permit compliance. This development will be a marked improvement over the existing invasive, non-native vegetation growing on low-infiltration soils. The use of BMPs listed in this assessment will create more permeable soil area, and more functional plantings, than currently exist onsite. While urban development faces many stormwater compliance challenges, this site can be effectively developed to detain and treat stormwater per applicable regulations. Because a net increase in soil permeability and detention will result from soil quality improvement, landscaping, and LID, the project will meet the State MS4 Permit Regulated Project and Hydromodification requirements without additional detention measures.

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APPENDICES

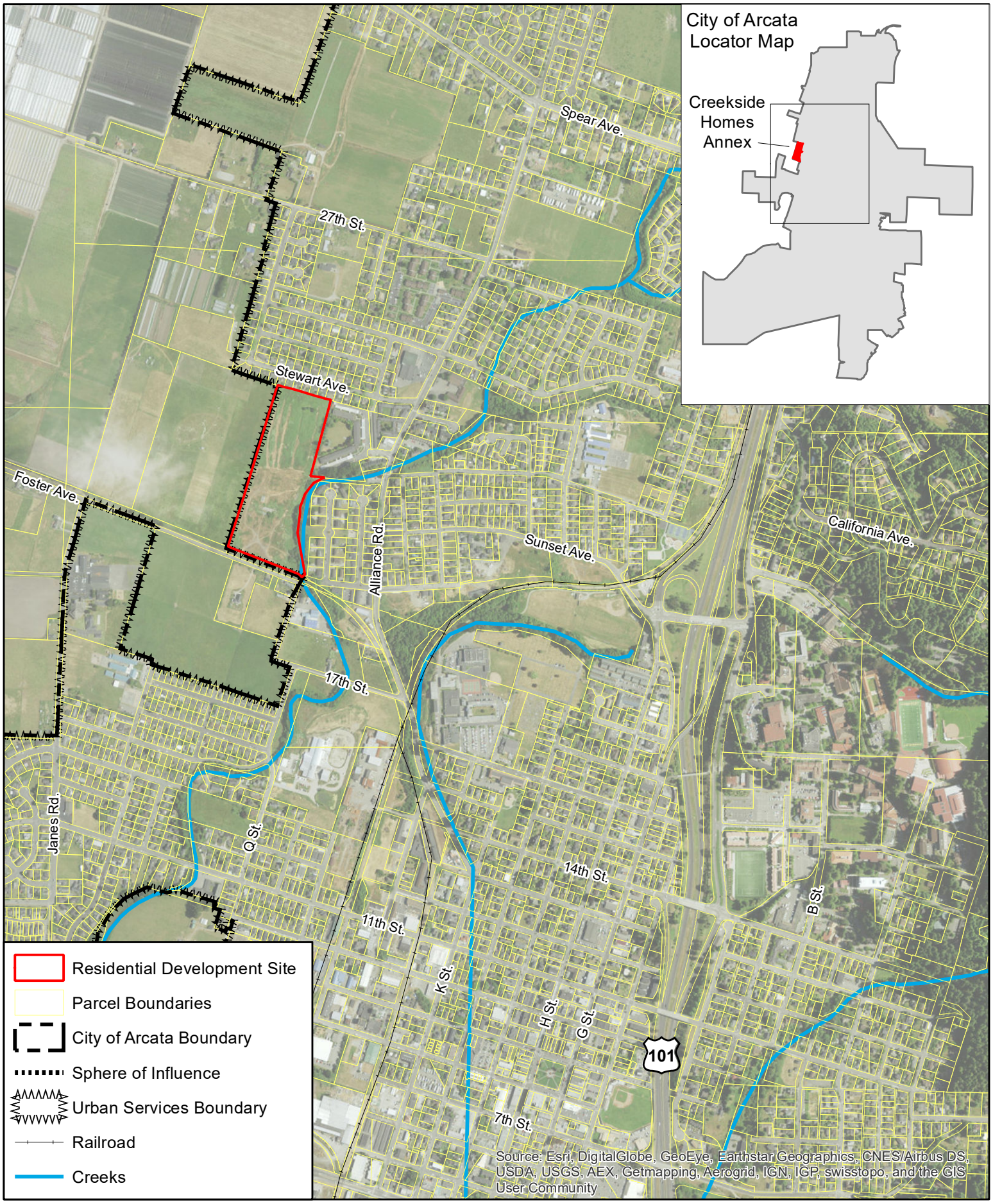
1. Site Location Map

2. Humboldt LID Stormwater Manual V2.0, Regulated Projects Worksheet 2

3. Soil Profile Description Data Sheets

Site Location Map 1

Creekside Homes Project Location



Map Compiled by:
Streamline Planning Consultants
January 2017

0 500 1,000 Feet

N

Streamline Planning Consultants

Humboldt LID Stormwater Manual V2.0, Regulated Projects Worksheet 2

2

APPENDIX X

Regulated Projects Worksheet 2
Humboldt Low Impact Development Stormwater Manual

Project Information						*Formulas/Notes*
DMA Name:						
Total Post-Project Impervious Surface Area (square feet)			A	273557	square feet	
24 hour - 85th Percentile Design Storm			B	0.65	inch	**B** = Select Design Storm Value (0.65-inch Humboldt Bay Area, 1.3-inch Shelter Cove)
Impervious Surface Runoff Value (Potential Stormwater Runoff due to impervious surface area and design storm value)			C	110393	Gallons per 24 hours	**C = A x B x 0.083 x 7.48**
Pervious Self-Retaining Area (SRA) Credit (if applicable, if none enter 0)						
Self-Retaining Area (square feet)	22426	3.5	SRA Credit	78491	square feet	SRA Credit = Self-Retaining Area x Multiplier. Select **Multiplier** (3.5 Humboldt Bay Area, 1.3 Shelter Cove)
Site Design Measure Credits						
Tree Planting and Preservation						
New Trees		# of trees				
100 square feet per deciduous tree	D	103	E	10300	square feet	E = D x 100
200 square feet per evergreen tree	F	155	G	31000	square feet	G = F x 200
Existing Trees (Credit for 50% of existing canopy area)		Canopy diameter (feet)				
Tree #1	H_1	100	J_1	3925	square feet	$J_1 = 3.14 \times (H_1/2)^2 \times 0.50$
Tree #2	H_2	30	J_2	353	square feet	$J_2 = 3.14 \times (H_2/2)^2 \times 0.50$
Tree #3	H_3	30	J_3	353	square feet	$J_3 = 3.14 \times (H_3/2)^2 \times 0.50$
Rain Barrel or Cisterns (55 gallon minimum)						
Square foot credit per gallon based on 24-hour, 85th Percentile Design Storm	K	2.48				**K** = Select square foot credit per gallon (2.48 Humboldt Bay Area, 1.24 Shelter Cove)
		Gallons				
Rain Barrels	L	0	M	0	square feet	M = L x K
Cisterns	N	0	O	0	square feet	O = N x K
Infiltration Trench/Basin (55 gallon minimum ~ 21 ft³)**		cubic feet				
volume(ft^3) = length x width x depth	P	0	Q	0	square feet	Q = P x R x K x 7.48
porosity (approximate %)	R	35%				
Subsurface Infiltrators (55 gallon minimum)						
Proprietary units vary, insert estimated storage in ft^3	S	0	T	0	square feet	T = S x 7.48
Impervious Area Disconnection						
Credit per square foot of pervious receiving area			U	0	square feet	U = Enter square foot value
Soil Quality Improvement						
Credit per square foot of soil quality improvement			V	119202	square feet	V = Enter square foot value
Green Roof						
Credit per square foot of green roof installation			W	0	square feet	W = Enter square foot value
PPPP (Alternative engineered hardscaping surfaces)						
Credit per square foot of PPPP			X	92783	square feet	X = Enter square foot value
Vegetated Swales						
Credit per square foot of vegetated swale			Y	0	square feet	Y = Enter square foot value
Stream Setbacks and Buffers						
Credit per square foot of stream setback and buffer#			Z	0	square feet	Z = Enter square foot value
Credits Total			AA	336408	square feet	AA = SRA Credit + E + G + J_1 + J_2 + J_3 + M + O + Q + T + U + V + W + X + Y + Z
Post-Project Impervious Surface Area minus Site Design Measure Credits			BB	-62851	square feet	BB = A - AA
NEW Impervious Surface Runoff Value (Potential Stormwater Runoff due to impervious surface area and design storm after implementation of Site Design Measures)			CC	-25363	Gallons per 24 hours	CC = BB x B x 0.083 x 7.48
Percent reduction in Impervious Surface Runoff Value*			DD	123.0	%	DD = ((C - CC) / C) x 100%

***If value for DD is not greater than or equal to %100 then bioretention is required for treating remaining runoff from impervious area indicated by value BB. Design and implement bioretention facility in accordance with Humboldt LID Stormwater Manual - Part C.**

****Infiltration Trench/Basin calculations are based on porosity (35%). Increased trench dimensions (volume) are required to meet 55 gallon minimum capacity.**

Green — Fill In [Enter Value]	Conversions Used:
Red — Calculated Value	1 inch = 0.083 feet
Black — Fixed Value/Selectable Value	1 cubic foot = 7.48 gallons
Regulated Projects Worksheet 2, Version 2.0 - June 29, 2016	# check with agency with project area jurisdiction for requirements

Soil Profile Description Data Sheets 3

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APPENDIX X

~20m N of Foster Ave Soil Profile Description

General Location DANCO Greenside - SE Corner upper Greenbank(w) Plot # 2

Legal Description Lat 40.880825° Long -124.094272° Date 3-27-18

Natural Vegetation or Crop Spruce, Alder, Willo, Stng Nettle Rainfall 46" An AVG % Slope 4 (Top of Bank)

Parent Material Alluvium Landform Bottomland Shape Linear Length 20'

Drainage Class Well Drained Hydraulic Cond. High Aspect East Elevation 33'

Available H_2O Cap. High Effective Depth V Deep Runoff LV Soil Temp. /

Horizon			Lower Depth (cm.)	Bound. (dist., topo)	Structure			Color		Texture				Cons.		pH	Roots	Redox
Master	Sub.	No.			Grade	Size	Shape	Hue	V/C	% Co. Frag.	Clay %	Sand %	Tex. Class	D/M	S/P		Amt./Size	
A	/	1	12	G/W	ST	F	SBK	10YR	2/1	29	12	55	GrSL	SH/Fr	SS/PS	/	C/F+VC	/
			24+	/	MO	F	SBK			25	16	53	GrSL	SH/Fr	SS/PS	/	C/F+VC	/

Notes: AVG Co. Soil fraction (Sand) = 55% so meets §5.8 of Part C in Humboldt Co LID Manl

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APPENDIX X

~100m N of Foster Ave Soil Profile Description

General Location BANCO Creekside - SE Corner upper Creekbank Vic (W) Plot # 1

Legal Description Lat 40.880352° Long -124.094235° Date 3-27-18

Natural Vegetation or Crop Spruce, Alder, Willow, Rainfall 46" An AVG % Slope 70

Parent Material Alluvium Landform Bottomland Shape linear Length 30'

Drainage Class Well Drained Hydraulic Cond. High Aspect East Elevation 39'

Available H_2O Cap. High Effective Depth VDeep Runoff Moderate (slope) Soil Temp. /

Horizon			Lower Depth (~~cm.~~) (in.)	Bound. (dist., topo)	Structure			Color		Texture				Cons.		pH	Roots	Redox
Master	Sub.	No.			Grade	Size	Shape	Hue	V/C	% Co. Frag.	Clay %	Sand %	Tex. Class	D/M	S/P		Amt./Size	
A	/	1	14	G/W	ST	F	SBK	10YR	2/1	31	11	58	Gr SL	SH/FR	SS/PS	/	C/FoVC	/
			24+	/	MO	F	SBK			26	17	53	Gr SL	SH/FR	SS/PS	/	C/FoVC	/

Notes:

APPENDIX X

Eureka, CA | Arcata, CA | Redding, CA | Willits, CA | Coos Bay, OR | Klamath Falls, OR

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Biological Assessment

North Coast Export
Foster Avenue Property
Arcata, California

Parcel # 505-161-11

Prepared For: Oscar Larson & Associates
317 Third Street
P.O. Box 3806
Eureka, CA 95502-3806
Attn: Marty McClelland

Prepared By: Mad River Biologist
Stephanie Morrissette, Associate Biologist
Ron LeValley, Senior Biologist

Submitted: June 7, 2000

Stephanie Morrissette

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I. Summary / Abstract

A biological assessment for North Coast Export's property located on Foster Avenue in Arcata, California was conducted by Mad River Biologists. A site visit took place on May 18, 2000 by Stephanie Morrissette and Ron LeValley of Mad River Biologists. The purpose of the investigation was to assess the property for the presence of sensitive flora and fauna and to characterize the adjacent riparian vegetation associated with Janes Creek. The property owners are seeking to annex the parcel to the City of Arcata and develop it for residential use.

Janes Creek, a small third order stream, borders the parcel along its southeast property line. This type of wetland is classified as a riverine, lower perennial wetland by the U.S. Fish and Wildlife Service (Cowardin, 1979). The riparian vegetation associated with the creek is largely the result of restoration efforts conducted in 1995 by Redwood Community Action Agency. Native riparian vegetation was planted along the creek to increase native species diversity and increase habitat value for terrestrial and aquatic organisms. Due to lack of funding, the planted riparian vegetation has not been maintained since the restoration project ended and sections of the creek have become infested with reed canary grass (*Phalaris arundinacea*). Similarly, Himalaya blackberry (*Rubus discolor*) now dominates the shrub layer on the banks, and is shading out many of the conifer saplings. Willow and alder trees have become well established along sections of the creek and offer partial shading. The width of the woody riparian vegetation is represented on the aerial photograph included in Appendix B. It ranges between 5 and 25 feet on the western bank, but goes up to 100 feet at the southeast corner of the parcel where several large willow trees exist.

Outside of the riparian zone, the remainder of the parcel represents an upland site. Historically the parcel was used for the location of a lumber mill. Fill material caps the parcel and the vegetation is primarily composed of non-native annual grasses, invasive shrubs, and a few native willows. Scant concentrations of wetland vegetation (*Juncus effusus*, *Mentha pulegium*) have become established in several small, ruderal areas on the north end of the parcel. These "wet spots" are not considered wetland habitats due to the absence of hydric soils, the predominance of upland vegetation, and because hydrology in these areas is largely a result of compaction of the fill material associated with disturbance from heavy equipment.

Sensitive species addressed include all those listed as rare or endangered by the U.S. Fish and Wildlife Service, or which are candidates for listing; all species designated rare, threatened, or endangered by the California Fish and Game Commission, and all plants listed in the California Native Plant Society's Inventory of Rare and Endangered Plants of California (Fifth Edition, 1994). The parcel and riparian habitat was intensively surveyed on the ground to detect rarities at a seasonally appropriate time. No rare plant or animal species were discovered on or adjacent to the site as a result of the field investigation, nor were any expected due to the highly disturbed nature of the parcel and riparian habitat. A compiled species list for the parcel is included, as Appendix A. In-stream surveys for aquatic organisms were not conducted as a part of this assessment. Management strategies for potentially occurring sensitive flora and fauna within the creek would include maintaining the integrity of the riparian habitat and water quality.

The segment of Janes Creek adjacent to the North Coast Export parcel is part of the 100-year flood plain. The wetland setback from development will likely adhere to FEMA (Federal Emergency Management Agency) policy, but may depend on any number of factors, including the specifics of proposed development projects. Janes Creek could benefit from the parcel's annexation to the City of Arcata by allowing an easement for the City to conduct maintenance on the creek and by establishing buffers that will help maintain the integrity of the riparian habitat.

II. Introduction

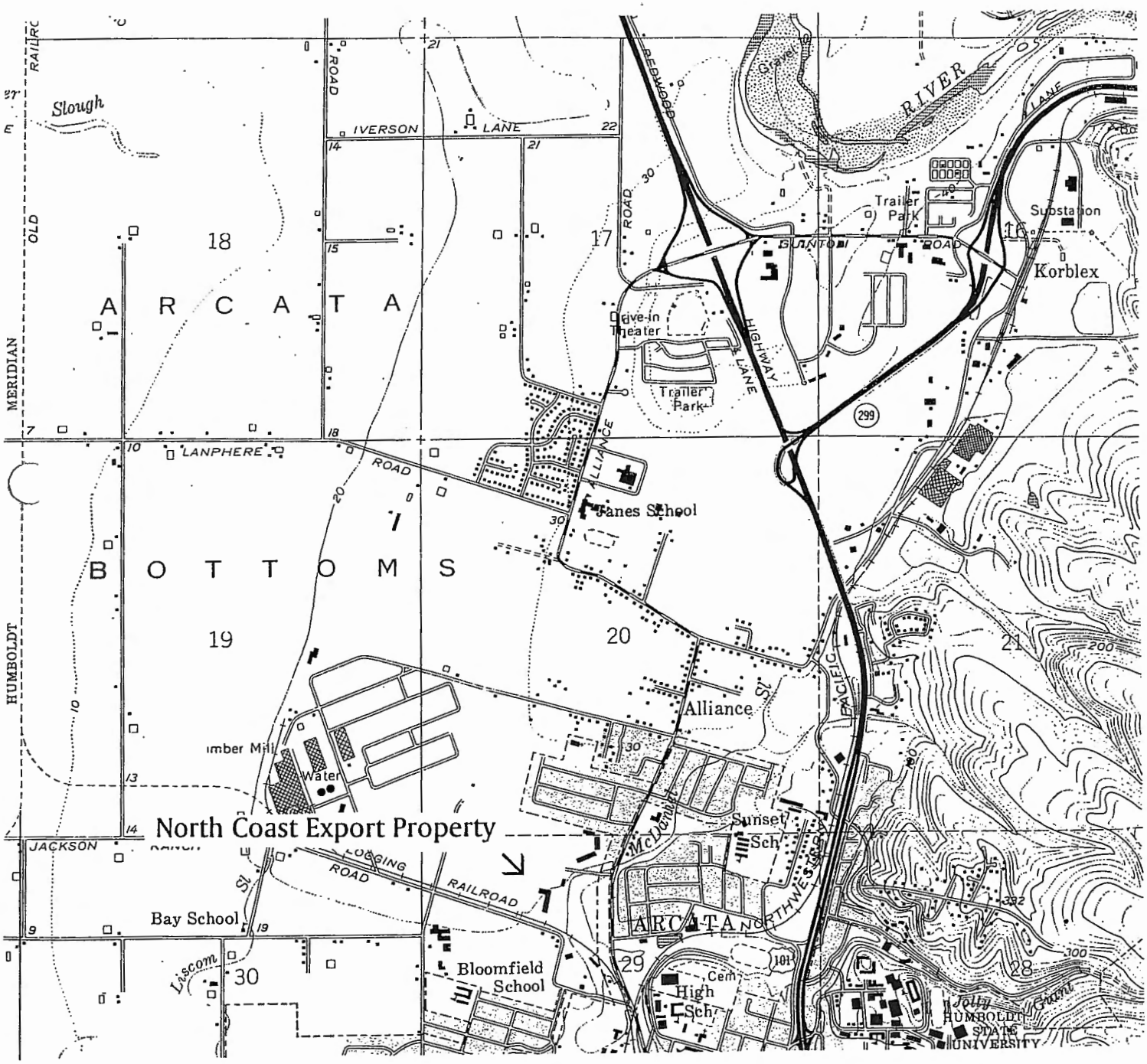
On May 18, 2000, Mad River Biologists conducted a biological reconnaissance on North Coast Export's property, assessor's parcel # 505-161-11, which borders McDaniel Slough (Janes Creek) in Arcata, California. The purpose of this investigation was to address environmentally sensitive resources on and adjacent to the property to aide in evaluating the development potential of the site. The parcel is located on the Arcata North Calif. 7.5 min. USGS quadrangle (T6N, R1E, NW ¼ of Sec. 29). The biological investigation was conducted on-site by Stephanie Morrissette, Associate Biologist, and Ron LeValley, Senior Biologist.

North Coast Export is seeking to annex the parcel to the City of Arcata and develop it for residential use. The City has pre-zoned the parcel R-M, medium density residential. Annexation to the City would place the parcel under City jurisdiction, which would require that an easement be established for the creek zone. This easement would prohibit development and grading in the creek zone and give the City the right to provide necessary maintenance for flood and habitat protection. Presently, the City has no scheduled maintenance for Janes Creek but does perform minimal culvert cleaning as part of their public works budget. FEMA (Federal Emergency Management Agency) flood data for the parcel is represented on City of Arcata maps in Appendix B, and shows that sections of the parcel are partially covered by the 100-year flood zone. The riparian vegetation along Janes Creek is characterized in this report. Aerial photographs of the site were used to determine vegetative cover and width of the riparian habitat along Janes Creek. This information, along with the FEMA flood plain data will aide City managers in determining appropriate setbacks from the creek.

A creek zone, as defined in Arcata's Creek Management Plan, is "the area that is 25 feet outward from the top of the bank, or the area bounded by the FEMA flood plain line, whichever is greater; except in no case will the creek zone on either side of a creek be wider than 100 feet from the average flow line of that creek. The top of the bank shall be the furthest break in slope of the bank to each side of a creek. Where the top of the bank is not clearly defined by an obvious break in slope, the City Engineer shall verify the top of the bank".

APPENDIX Y

Site Location Map — North Coast Export Property, A.P. 505-161-11
Arcata North Calif. 7.5 min. USGS quadrangle
T6N, R1E, NW ¼ of Sec. 29, Scale 1:24,000



III. Site Description

North Coast Export Parcel-Upland Areas

Most of the parcel represents a highly disturbed upland site composed chiefly of fill material. In the 1950's and 60's a sawmill operated on the site, producing milled lumber. Then in the mid-1980's North Coast Export Company operated a whole log chipping facility for about a 2 to 3 year period. The site was vacated in the late 1980's and it now sits as a vacant lot (pers. comm. with Tony Titus of Eel River Saw Mills, June 2, 2000). Remnants of concrete structures (ramps, debarker slab, foundations, etc...) left over from the sawmill still exist. The parcel is bordered by railroad tracks along its southern boundary, agricultural land to the west, and residential housing exists north and northeast of the property lines. Janes Creek runs more or less north to south along the parcel's southeast property line. Evidence for current disturbance to the site include several trails through the parcel, solid waste material (garbage) scattered throughout, and the existence of what appears to be an encampment within a blackberry/willow thicket on the north end.

The north end of the property is over-run with dense thickets of Himalaya blackberry (*Rubus discolor*) with a few willows (*Salix* sp.) interspersed throughout. This area was the location of the log deck for the mill that once operated here. Several small (5 m^2 and smaller) ruderal areas have eroded away and/or become compacted from vehicular traffic or mill operations and surface water presently collects for sufficient time to support scant concentrations of wetland vegetation (*Juncus effusus, Mentha pulegium*). These "wet spots" are not considered wetland habitats due to the absence of hydric soils, the dominance of upland vegetation, and because hydrology in these areas is largely a result of compaction of the fill material.

The remainder of the parcel is predominately covered with non-native species that tend to favor disturbance (*Rubus discolor, Vicia sativa, Vicia cracca, Lotus corniculatus, Plantago lanceolata*). A complete list of species detected on the parcel is attached as Appendix A to this report. Since the appearance of many species is dependent on the season, this list should not be considered complete. It is, however, very useful for characterizing the site. In most cases, plants were identified to species, except in a few cases; plants were identified only to genus due to the absence of flower and/or fruit.

Adjacent Riparian Areas

The property borders Janes Creek along its eastern property line. Janes Creek is considered a small third order stream (Suthard, undated report). The U.S. Fish and Wildlife Service would classify such a system as a riverine, lower perennial wetland (Cowardin, 1979). Janes Creek flows through residential, agricultural and industrial land use areas before it reaches Foster Avenue. The major disturbances to this watershed have been channelization and urban encroachment.

Restoration work along sections of the creek where it borders the North Coast Export property was performed by Redwood Community Action Agency in 1995. This work involved cutting back the banks and terracing the slope to increase flood storage, establishing in-stream structures to improve channel complexity for fish habitat, removal of non-native vegetation, and revegetating with native riparian vegetation. Prior to the restoration work, the stream banks were covered with Himalaya berry and reed canary grass (*Phalaris arundinacea*), both invasive exotics. Although these species

function to stabilize the bank, they do not allow for species diversity or aesthetic value of the creek. The non-native vegetation was mowed, excavated and/or hand cleared from the site and the banks were replanted with black cottonwood (*Populus balsamifera ssp. trichocarpa*), Sitka spruce (*Picea sitchensis*), Western red cedar (*Thuja plicata*), red alder (*Alnus rubra*), coast redwood (*Sequoia sempervirens*), willow (*Salix* sp.), Douglas-fir (*Pseudotsuga menziesii*), shore pine (*Pinus contorta* ssp. *contorta*), wax myrtle (*Myrica californica*), thimbleberry (*Rubus parviflorus*) and other native trees and shrubs. Re-vegetating the banks with native riparian vegetation will increase plant diversity, provide stream bank stabilization for the recently re-contoured banks, and increase shade necessary for improved fish habitat. Unfortunately, maintenance of this vegetation was not performed after the project ended due to lack of funding and many of the non-native, invasive species (primarily Himalaya berry) have returned and are in competition with the native trees and shrubs. Reed canary grass was observed growing in thick mats within the channel in a couple of locations.

Mortality of the planted riparian vegetation was low after the first year of the restoration project, but appears to be slightly higher now since competition with invasive species is relatively high (big leaf maple (*Acer macrophyllum*) and dogwood (*Cornus sericea*) were not detected along the creek—two species identified in revegetation efforts). The willow and red alder trees along the bank are well-established and average 20 meters in height. The tallest willow trees are approximately 40 meters tall, located at the southeast corner of the parcel. Many of the planted conifers have also become established, but they still do not offer any significant amount of shade for the creek. Himalaya berry dominates the open canopy areas along the banks. The width of the Riparian vegetation ranges between 5 and 25 feet out from the center of the creek on the west bank, but is as great as 100 feet at the southeast corner of the parcel where several large willows dominate (reference aerial photo, Appendix B).

Culvert

The creek flows through an "arch type" cement culvert on the east side of the property where it meets an easement. This culvert is approximately 15 feet wide and 3 to 4 feet tall with no apparent impediment to fish movement. The vegetation along the bank in this section of the creek is primarily Himalaya berry and common horsetail (*Equisetum arvense*).

The vegetation north of the culvert is dominated by larger (50+ meter) coast redwoods, Douglas-fir, and black cottonwoods. This segment of the creek is not adjacent to the assessed parcel but borders an easement to the parcel. Canopy closure is greater here than it is south of the culvert, and native trees, shrubs and herbs dominate the banks. Fencing separates the creek from adjacent apartment housing, but garbage is still conspicuous along the creek bank.

IV. Environmentally Sensitive Resources

Wetland Habitats

Riparian vegetation refers to those plants found in the channel, floodplain and banks of a stream and is usually easily differentiated from surrounding vegetation (Carlson, undated report). This type of vegetation is a very important component of riparian systems, as it functions to maintain a stable riparian system. The restoration work conducted by RCAA increased species diversity by introducing native riparian vegetation along the creek. Once established, this vegetation will provide shade, which will function to maintain water quality by filtering insolation and moderating water temperatures. It will also work to stabilize banks from soil erosion and provide habitat for terrestrial and aquatic organisms.

If riparian vegetation is altered or lost, due to either urban development or competition with invasive species, the characteristics of the stream can change, leading to loss of indigenous fish habitat. Electrofishing at the site performed by RCAA prior to their restoration work found coastal cutthroat trout, three spine stickleback, and Pacific giant salamanders in this stretch of the creek.

Equally important, wetland habitats such as this function to store and transport storm water. Approximately 1500 cubic yards of material was removed from the stream channel as a part of RCAA's effort to increase channel capacity. Maintaining channel capacity by removing natural and foreign debris, removing invasive exotics such as reed canary grass, and possibly routine dredging could be components of flood control efforts.

Rare Plants

Sensitive plant species addressed include all those listed as rare or endangered by the U.S. Fish and Wildlife Service, or which are candidates for listing; all species designated rare, threatened, or endangered by the California Fish and Game Commission, and all plants listed in the California Native Plant Society's Inventory of Rare and Endangered Plants of California (Fifth Edition, 1994). Published literature was reviewed to determine the potential for these species to occur on or adjacent to the parcel.

The rare plant survey was conducted at a seasonally appropriate time for most, but not all, of the listed species. In most cases, plants were identified to species, except in a few cases; plants were identified only to genus due to the absence of flower and/or fruit. In all case where plants were unable to be identified to a specific epithet, rare species could be excluded due to the identifiable features at hand or by the absence of certain habitat requirements. No sensitive plants were discovered from the field survey, nor are any expected to occur on the parcel or in the associated riparian habitat due to the highly disturbed nature of the site. Likewise, to the best of our knowledge, no historical records of rare plants have been documented for the site.

Wildlife

A list of wildlife species of special interest due to their inclusion on Federal or State endangered, threatened or special concern lists and their potential for occurrence at the project site, is included as Table 1. These species were particularly kept in mind during the field inspection.

Table 1
Wildlife Species of Special Concern

Common name	*Scientific Name*	*Designation*
Fish		
Steelhead (Northern CA ESU)	*Oncorhynchus mykiss*	CSC
Coho Salmon (S. OR/N. CA Coastal ESU)	*Oncorhynchus kisutch*	FT
Chinook Salmon (California Coastal ESU)	*Oncorhynchus tshawytscha*	FT
Amphibians		
Southern Torrent Salamander	*Rhyacotriton variegatus*	CSC
Del Norte Salamander	*Plethodon elongatus*	CSC
Tailed Frog	*Ascaphus truei*	CSC
Northern Red-legged Frog	*Rana aurora aurora*	CSC
Foothill Yellow-legged Frog	*Rana boylii*	CSC
Reptiles		
Northwestern Pond Turtle	*Clemmys marmorata marmorata*	CSC
Birds		
Aleutian Canada Goose	*Branta canadensis leucopareia*	FE
Bald Eagle	*Haliaeetus leucocephalus*	CE, CP
Osprey	*Pandion haliaetus*	CSC
Sharp-shinned Hawk	*Accipiter striatus*	CSC
Cooper's Hawk	*Accipiter cooperi*	CSC
Merlin	*Falco columbianus*	CSC
American Peregrine Falcon	*Falco peregrinus anatum*	CE, CP
Marbled Murrelet	*Brachyramphus marmorata*	CE, FT
Northern Spotted Owl	*Strix occidentalis caurina*	FT
Bank Swallow	*Riparia riparia*	CT
Vaux's Swift	*Chaetura vauxi*	CSC
Purple Martin	*Progne subis*	CSC
Black-capped Chickadee	*Parus atricapillus*	CSC
Yellow Warbler	*Dendroica petechia*	CSC
Yellow-breasted Chat	*Icteria virens*	CSC
Mammals		
Townsend's Big-eared Bat	*Plecotus townsendii townsendii*	CSC
White-footed Vole	*Arborimus albipes*	CSC

CE = Listed as Endangered by the State of California
FE = Listed as Endangered by the Federal Government
FT = Listed as Threatened by the Federal Government
CT = Listed as Threatened by the State of California
CP = California Protected Species
CSC = California Species of Special Concern
FSC = Federal Species of Special Concern

Species Accounts

Klamath Mountains Province Steelhead (*Oncorhynchus mykiss*)
Steelhead (or Steelhead Rainbow Trout) are found in the North Pacific Ocean from the Kamchatka Peninsula in Asia to the northern Baja Peninsula. Many of the populations in California have been designated as endangered or threatened. The Klamath Mountains Province ESU is a candidate for listing. Adult Steelhead enter the Humboldt Bay estuary as early as September and remain there until conditions are right for migrating upstream to spawn. Adults may remain in the system until as late as January. Young Steelhead (smolts) may be present in the estuary all year.

This investigation did not include surveys downstream from the project site. Potential salmonid access to the site is unknown, however since fish passage is not limited by the stream at the site, the primary concern for these fish populations is for maintaining healthy riparian vegetation and water quality characteristics.

Southern Oregon/Northern California Coho Salmon *(Oncorhynchus kisutch)*
Coho salmon are found in the North Pacific Basin from California to Alaska and from Russia to Japan. While populations seem relatively healthy in Alaska and parts of British Columbia, selected populations in the continental U.S. rivers have declined dramatically and a few of the Ecologically Sustainable Units (ESUs) have been designated threatened or endangered. The Southern Oregon/Coastal California ESU was designated threatened by the Fish and Wildlife Service on May 6, 1997. Adult Coho enter the Humboldt Bay estuary as early as September and remain in the system until as late January. Young Coho (smolts) may be present in the estuary all year.

This investigation did not include surveys downstream from the project site. Potential salmonid access to the site is unknown, however since fish passage is not limited by the stream at the site, the primary concern for these fish populations is for maintaining healthy riparian vegetation and water quality characteristics.

California Coastal Chinook Salmon *(Oncorhynchus tshawytscha)*
Chinook (or King) salmon were historically distributed along the coast of North America from the Ventura River in southern California to Point Hope, Alaska, and the Mackenzie River area in Canada. In the western Pacific they were found in Northeast Asia from Hokkaido, Japan, to the Anadyr River, Russia. While populations seem relatively healthy in Alaska and parts of British Columbia, selected populations in the continental U.S. rivers have declined dramatically and a few of the Ecologically Sustainable Units (ESUs) have been designated threatened or endangered. The California Coastal ESU was listed as Threatened in September 1999. Adult Chinook may enter the Humboldt Bay estuary as early as September and remain in the system until as late as January. Young Chinook (smolts) may be present in the estuary all year.

This investigation did not include surveys downstream from the project site. Potential salmonid access to the site is unknown, however since fish passage is not limited by the stream at the site, the primary concern for these fish populations is for maintaining healthy riparian vegetation and water quality characteristics.

Southern Torrent Salamander (*Rhyacotriton variegates)*
The Southern Torrent Salamander (recently distinguished from the Olympic Salamander *Rhyacotriton olympicus* is found primarily along the coast from the Olympic Peninsula to Sonoma County, California. It is an inhabitant of cold, clear streams, springs and seeps in Douglas-fir and Redwood forests, rarely straying away from the splash zone.

The Southern Torrent Salamander is a Species of Special Concern in California. Suitable habitat for the Torrent Salamander does not occur at the assessed site.

Del Norte Salamander (*Plethodon elongates)*
Found in Del Norte, Humboldt and Siskiyou Cos., the Del Norte Salamander is typically found in riparian, hardwood and conifer forests of many seral stages. It is found primarily within rockslides or talus slopes, beneath rotting logs and under slabs of bark in damp, but not wet, situations. It can also be found in old road fills and rocky outcrops. The Del Norte Salamander is a lungless salamander that does not require standing water.

The Del Norte Salamander is considered a Species of Special Concern in California and is a Candidate for Federal Listing. Suitable habitat for this species does not occur at the assessed site.

Tailed Frog (*Ascaphus truei)*
Found in most of northwestern California, the Tailed Frog is probably fairly common in suitable habitat. It is found in and near clear, cold streams in conifer or hardwood/conifer forests. The Tailed Frog is more often found in wet stands than in moderately wet stands and is absent from dry stands. Their distribution may be limited by the presence of cold, year-round flowing streams. The larvae, which are restricted to an aquatic existence, take 2-3 years to transform into adults. A number of studies have indicated that Tailed Frogs disappear from logged areas, probably as a result of increased water temperatures and siltation. This effect may be more prominent inland than on the coast.

The Tailed Frog is a Species of Special Concern in California. Suitable habitat for this species does not occur at the assessed site.

Northern Red-legged Frog (*Rana aurora aurora)*
The Northern Red-legged Frog is typically found in ponded areas along the Coast and Cascade Ranges from northern California to southern British Columbia. Here on the north coast of California it is widespread in ponds and along rivers where there is quiet water and emergent aquatic vegetation providing cover. When not breeding this species wanders widely in damp woods, including riparian and coniferous forests. Breeding takes place in late winter and early spring. Red-legged frogs have a weak voice and are consequently inconspicuous. Egg masses consisting of up to 2-3,000 eggs are deposited in water up to 6" deep. Most young are completely transformed into adults by mid-summer or earlier. The diet of Red-legged Frogs consists primarily of insects captured near water.

The Northern Red-legged Frog is considered a Species of Special Concern in California and is a Candidate for Federal Listing. The main reasons for concern in California are declining habitat and predation by the introduced Bullfrog *Rana catesbiana*. The Red-legged Frog could occur along the stream at the assessed site. Management recommendations center on the maintenance of healthy

wetland habitats and the control of introduced bullfrogs. Specific management strategies for this species would depend on the nature and extent of proposed projects.

Foothill Yellow-legged Frog (*Rana boylii)*
The Foothill Yellow-legged Frog is found in coastal and foothill habitats throughout northern California. Its preferred habitat is along streams and rivers, especially where riffles are present. The Yellow-legged Frog escapes into the water and hides among vegetation or in the bottom when disturbed. It is less likely to use the riparian forests and other adjacent habitats than other frogs. Breeding takes place later in the spring, when high water flows have subsided: Eggs are laid in a mass of up to 1,000 eggs and are attached to rocks in shallow, flowing water. Larvae transform into frogs during the summer.

The Foothill Yellow-legged Frog is considered a Species of Special Concern in California and is a Candidate for Federal Listing. The main reasons for concern in California are declining habitat and predation by the introduced Bullfrog. Along the north coast, Yellow-legged Frogs are found in most rivers and large streams. Typical habitat for this species does not occur at the assessed site.

Northwestern Pond Turtle (*Clemmys marmorata marmorata)*
The Western Pond Turtle is the only native aquatic turtle in California. It is widely distributed west of the Cascades and Sierra Nevada. Pond Turtles are found near and in water, especially slow moving or quiet waters, primarily ponds, small lakes, reservoirs, and quiet streams and rivers. They can be found basking on rocks, logs or on the bank along aquatic vegetation. Basking perches seem to be an important component of their habitat needs. Females lay a clutch of 5-11 eggs between April and August in a small hole in a dirt bank, sometimes at a distance from their home water. The diet of Pond Turtles consists of aquatic plants, fish, invertebrates and carrion.

The Northwestern Pond Turtle is considered a Species of Special Concern in California and is a Candidate for Federal Listing. Along the north coast of California, the Pond Turtle is sparsely distributed, mainly at ponds in the interior. This species, like the Yellow-legged Frog, seems to prefer sunny areas and so may avoid the coastal fog belt. Pond Turtles are not likely to occur at the assessed site due to the absence of freshwater ponds.

Aleutian Canada Goose (*Branta canadensis leucopareia)*
The Aleutian Canada Goose is a subspecies of a widely distributed and well-known goose. This form breeds on selected Aleutian Islands in Alaska and winters primarily in California. Important feeding and roosting sites are nearby in Del Norte County, including Castle Rock just south of Pt. St. George and the Lake Earl Wildlife Management Area. Increasing numbers of this form use the agricultural pastures around Humboldt Bay during migration.

The Aleutian race of the Canada Goose has been recently proposed for removal from the federal Endangered Species list. This species is not likely to utilize the habitats at the assessed site.

Bald Eagle(*Haliaeetus leucocephalus)*
The Bald Eagle is found throughout North America and occurs widely in California. Concentrations of Bald Eagles are found where their preferred food is concentrated, i.e. in major waterfowl wintering areas and along major salmon streams and rivers with adjacent snags for perching. Nesting takes place in large stick nests, usually high in a tree, living or dead. Eggs can be laid as early as January, incubation is 30-45 days, and the young take their first flight approximately 2 and 1/2 months after

hatching. Their food consists largely of fish, either caught themselves or stolen from Ospreys. Bald Eagles also feed upon a wide variety of small mammals, aquatic birds, and even carrion.

The Bald Eagle has been proposed for removal from the federal Endangered Species list. It is a California Protected Species. The closest known nest sites of the Bald Eagle are at the Mad River near Blue Lake, the lagoons of northern Humboldt County, and the South Fork of the Trinity River. An increase in the local population has resulted in increased winter sightings. Bald Eagles would be expected to occur around Humboldt Bay in winter and could potentially fly over the project site, but would not be expected to nest in the immediate vicinity of the site.

Osprey *(Pandion haliaetus)*
The Osprey is a well-known fish-eating bird found throughout the world. Locally it is a common nesting bird along all the major rivers, bays and lakes. Once considered in danger of extinction in North America, it has made an impressive comeback since the decline in use of DDT.

The Osprey is a Species of Special Concern in California. No Osprey nests were found during the assessment visit. Management recommendations depend on the location of nests and consist of reducing or eliminating disturbance during the nesting season. No nests are known from the project site, nor is there suitable nesting platforms for the establishment of nests.

Sharp-shinned Hawk *(Accipiter striatus)*
The Sharp-shinned Hawk is found throughout North America. It is found in a wide variety of forested and scrub habitats where it preys primarily on small birds. Populations in North America have declined due to pesticide residues, habitat destruction, and the general decline of the hawks' major prey, songbirds.

The Sharp-shinned Hawk is a Species of Special Concern in California. Locally, the Sharp-shinned Hawk is an uncommon winter resident and rare summer breeder. No nests are known from the assessed site. There is a very slight potential for a Sharp-shinned Hawk nest site in the riparian habitat on the site or in nearby forested areas. Management recommendations would depend on the location of nests and would consist of reducing or eliminating disturbance during the nesting season.

Cooper's Hawk *(Accipiter cooperi)*
The Cooper's Hawk is found throughout North America. It is found in a wide variety of forested and scrub habitats where it preys primarily on songbirds. Populations in North America have declined due to pesticide residues, habitat destruction, and the general decline of its major prey, songbirds. Locally, the Cooper's Hawk is an uncommon winter resident and rare summer breeder.

The Cooper's Hawk is a Species of Special Concern in California. No nests are known from the assessed site. There is slight potential for a Sharp-shinned Hawk nest site in the riparian habitat on the site or in nearby forested areas. Management recommendations would depend on the location of nests and would consist of reducing or eliminating disturbance during the nesting season.

Merlin *(Falco columbianus)*
The Merlin is found throughout North America. It is found in a wide variety of open habitats where it preys primarily on shorebirds and songbirds. Populations in North America have declined due to pesticide residues and habitat destruction.

The Merlin is a Species of Special Concern in California. Merlins are occasionally seen in winter around Humboldt Bay and may use the assessment site for winter foraging. Management recommendations consist of protecting riparian habitats and songbird and shorebird populations in general. Specific management strategies for this species would depend on the nature and extent of proposed projects.

American Peregrine Falcon *(Falco peregrinus anatum)*
The Peregrine Falcon is found throughout North America. It is often found in aquatic habitats where it preys primarily on water birds, both shorebirds and ducks. Populations in North America declined due to pesticide residues, nest disturbances (including the illegal removing of chicks for falconry) and habitat destruction.

Recovery of the species led to its removal from the endangered species list in August 1999 however its status remains in a 5-year review period. Locally, the Peregrine Falcon is an uncommon winter resident and rare summer breeder. Peregrines are occasionally seen in winter in the vicinity of the assessed site, but probably do not use the site except for rare winter foraging. Specific management strategies for this species would depend on the nature and extent of proposed projects.

Marbled Murrelet *(Brachyramphus marmorata)*
The Marbled Murrelet is an uncommon and reportedly declining marine bird that depends on old growth forests for nesting sites. In North America, it is distributed between Alaska and central California. The Marbled Murrelet is a small seabird somewhat larger than a robin. It occurs from the Aleutian archipelago south to central California. It is unique among seabirds in nesting exclusively in trees (except where there are no trees). Nest sites have been detected up to 52 miles inland in Washington. Marbled Murrelets are associated with Late Successional /Old Growth forests throughout most of their range. Almost all nests discovered in North America were in forests with Old Growth characteristics. Most nests are placed under overhanging branches. Nesting habitat must be available within flight distance of the ocean.

The Marbled Murrelet is a California Endangered and Federal Threatened species. There is no nesting habitat at the assessed site.

Northern Spotted Owl (Strix occidentalis caurina)
The Northern Spotted Owl is a medium-sized forest owl that occurs along the Pacific Coast from southwestern British Columbia to central California. It is strongly associated with Late-Successional/Old-Growth forests. In northern California the spotted owl also occurs in some types of relatively young forests, especially where those forests are structurally similar to Late Successional /Old Growth forests.

The Northern Spotted Owl is a Federally threatened species and a California Species of Special Concern. There is not suitable habitat for this species at the assessed site.

Bank Swallow *(Riparia riparia)*
The Bank Swallow is a scarce and local summer visitor to California. Although it is more widespread during migration, nesting localities are restricted to a few places, especially along riparian habitats. Bank Swallows excavate their own nesting holes in a dirt or sand bank. Nests are typically, but not

always, in a colony and near water. Nesting requirements include vertical banks with soft-textured soil suitable for burrow excavation.

The Bank Swallow is listed as threatened in California. Only two colonies of Bank Swallows are known in northwestern California – both in Del Norte County. Bank Swallows could rarely forage over the assessed site. No suitable nesting habitat was noted at the assessed site.

Vaux's Swift *(Chaetura vauxi)*
The Vaux's Swift is a small, insect-eating, summer resident bird of the coastal forests of Northwestern California. It feeds high in the air, often above the canopy of the forests and over meadows, water, and many other habitats. It roosts and nests in hollow trees and snags, especially those that have been burned.

The Vaux's Swift is a Species of Special Concern in California. Nesting habitat is potential in larger trees inland from the assessed site. Furthermore, Vaux's Swifts are known to use chimneys for nesting, and likely do so in nearby suburban areas. Management considerations of this species would be centered on maintenance of healthy forest habitats and maintaining or enhancing riparian and wetland areas preferred for feeding.

Purple Martin *(Progne subis)*
The Purple Martin is a large swallow, uncommon to rare and locally distributed in northern California. It feeds and nests in a wide variety of habitats, including Douglas-fir forests. It nests in cavities (usually old woodpecker holes) in tall trees, often near water.

The Purple Martin is a Species of Special Concern in California, largely due to loss of riparian habitat, removal of snags, and competition for nest cavities from Eurasian Starlings and House Sparrows. No Purple Martins were detected during the assessment visit, but this species would be expected to use the assessed site for feeding and could potentially nest in nearby forests with snags and large trees. Management recommendations include avoiding disturbance of dead and dying trees (which form the snags for nesting sites) and preserving wetlands, which provide feeding habitat.

Black-capped Chickadee *(Parus atricapillus)*
The Black-capped Chickadee is possibly the most abundant and best-known chickadee in North America. In California, it is found almost exclusively in willow/cottonwood habitats along the immediate north coast south to the vicinity of Ferndale, as well as a locally inland along the larger streams and rivers.

The Black-capped Chickadee is a Species of Special Concern in California due to its restricted range in the state. The Black-capped Chickadee is a common species in the willow habitats of extreme northwestern California and so its presence at the assessed site is expected. This species was not encountered during the assessment visit but is known to occur in the area. Management recommendations center around maintaining healthy stands of willows. Specific management strategies for this species would depend on the nature and extent of proposed projects.

California Yellow Warbler *(Dendroica petechia)*
Found throughout North America, the Yellow Warbler has been declining as a breeding bird in California due to habitat destruction and brood parasitization by the Brown-headed Cowbird. Its breeding habitat is in riparian deciduous forests of almost any size.

The Yellow Warbler is a Species of Special Concern in California. Yellow Warblers are uncommon breeding birds of the coastal riparian habitats. Occasional breeding birds could occur in the Alder/Willow habitats at the assessment site. Management recommendations consist of maintaining healthy riparian woodlands and reducing the impact from cowbirds. Specific management strategies for this species would depend on the nature and extent of proposed projects.

Yellow-breasted Chat *(Icteria viren)*
Found throughout North America, the Yellow-breasted Chat has been declining as a breeding bird in California due to habitat destruction. Its breeding habitat is in riparian deciduous forests of moderate or larger size.

The Yellow-breasted Chat is a Species of Special Concern in California. Occasional breeding birds could be expected in dense blackberry/willow habitats at the assessment site. Management recommendations consist of maintaining healthy riparian woodlands and reducing the impact from cowbirds. Specific management strategies for this species would depend on the nature and extent of proposed projects.

Townsend's Big-eared Bat *(Plecotus townsendii townsendii)*
The Townsend's Big-eared Bat is widespread in California. Small moths are it's principal food. The flight is slow and maneuverable; this species is capable of hovering. It feeds in flight and by gleaning from foliage. Townsend's Big-eared Bats are most abundant in mesic habitats. They roost in caves, mines, tunnels, and buildings, feeding along habitat edges. They are extremely sensitive to disturbance of roosting sites. All known sites in limestone caves in California have been abandoned.

The Townsend's Big-eared Bat is a California Species of Special Concern. Although no bats were seen during the assessment visit, this species could occur at the site. Management recommendations include maintaining the integrity of the existing forest and wetland areas. Large buildings suitable for roosting are not on the assessed site.

White-footed Vole *(Arborimus albipes)*
The White-footed Vole is found along the coastal slope of Oregon and extreme northern California. Its preferred habitat is humid coastal forests of Redwood, Douglas-fir and riparian species. White-footed Voles feed principally on the leaves of green plants. Locally this species is not well known, but seems to prefer riparian vegetation along small streams within the coastal coniferous forests. Red Alder seems to be preferred in some areas.

The White-footed Vole is a Species of Special Concern in California. Management recommendations center on the maintenance of healthy riparian habitats, even (or especially) small riparian stands within the coniferous forests. Specific management strategies for this species would depend on the nature and extent of proposed projects.

California Red Tree Vole *(Arborimus longicaudus)*
The Red Tree Vole is a little-known rodent of the coastal fog belt in California from Sonoma County north. It occurs in old-growth and other Douglas-fir and Redwood forests. Its diet is almost exclusively needles of Douglas-fir and Grand Fir. Nests are built of Douglas-fir needles in trees, sometimes at considerable heights.

The Red Tree Vole is a Species of Special Concern in California. This species would not be expected at the assessed site due to the lack of coniferous forests.

V. Recommendations

Establishing appropriate setbacks from the riparian vegetation (i.e. wetland habitat) from any development will depend on the nature of proposed projects and the adoption of other protective measures in development plans (example: erecting fences or natural vegetation screens). Screening the riparian zone from development will help keep non-point source pollution from entering the creek. Buffers such as these essentially filter pollutants, add some protection from domestic animals and humans and reduce the accumulation of trash and debris within the creek. In addition, surface runoff from the parcel and any development should be minimized by constructing driveways and parking areas in such a way to keep petroleum products and other solvents from entering the creek.

Bicycle parts were observed in the creek just downstream from the culvert. Solid waste (litter) and natural debris such as tree branches, woody shrub vegetation and dense mats of the non-native reed grass can restrict flow and trap natural and manmade floating debris, thereby reducing channel capacity and increasing flood potential. Routine eradication efforts of non-native, invasive species and removal of debris from the creek channel will be desirable to maintain the integrity of the riparian habitat and the capacity of the channel.

Janes creek could benefit from the parcel's annexation to the City of Arcata, by allowing for an easement for the City to conduct much needed maintenance on the creek and by establishing buffers that will help maintain the integrity of the riparian habitat.

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Appendix A Compiled Species List for North Coast Export Property, A.P. 505-161-11
May 18, 2000

Plant Species	Common Name	Wetland Status	Location
Aira caryophyllea	silver hairgrass	NL	U
Alnus rubra	red alder	FACW	R
Anthoxanthum odoratum	sweet vernal grass	FACU	U
Athyrium felix-femina	lady fern	FAC	R
Avena barbata	slender wild oat	NL	U
Baccharis pilularis	coyote bush	NL	U
Brassica nigra	black mustard	NL	B
Briza maxima	rattlesnake grass	NL	U
Briza minor	quaking grass	FACW-	U
Bromus diandrus	ripgut grass	NL	U
Bromus hordeaceus	brome	FACU-	U
Calamagrostis sp.	reed grass	FACW?	R
Chamomilla suaveolens	pineapple weed	NL	U
Cirsium arvense	Canada thistle	FAC-	U
Cirsium vulgare	bull thistle	FACU	U
Conium maculatum	poison hemlock	FACW	B
Cortaderia jubata	pampas grass	NL	U
Cotoneaster pannosa	cotoneaster	NL	U
Cynosurus echinatus	hedgehog dogtail	NL	U
Dactylis glomerata	orchard grass	FACU	U
Daucus carota	Queen Anne's lace	NL	B
Dipsacus sativus	Fuller's teasel	NL	B
[illegible]uisetum arvense	common horsetail	FAC	B
[illegible]oeniculum vulgare	fennel	FACU	U
Galium aparine	bedstraw	FACU	U
Geranium dissectum	cut-leaved geranium	NL	B
Hedera helix	English ivy	NL	B
Holcus lanatus	velvet grass	FAC	B
Hypochaeris radicata	rough cat's-ear	NL	U
Ilex aquifolium	English holly	NL	B
Juncus effusus	common rush	OBL	B
Linum usitatissimum	common flax	NL	U
Lolium multiflorum	Italian rye grass	FAC	U
Lotus corniculatus	bird's foot trefoil	FAC	U
Mentha pulegium	pennyroyal	OBL	U
Parentucellia viscosa	yellow parentucellia	NL	U
Phalaris arundinacea	canary reed grass	OBL	R
Picea sitchensis	Sitka spruce	FAC	R
Pinus contorta ssp. contorta	shore pine	FAC	R
Pinus radiata	Monterey pine	NL	R
Plantago lanceolata	English plantain	FAC-	U
Polygonum sp.	knotweed	unknown	B
Polystichum munitum	sword fern	NL	R
Populus balsamifera ssp. trichocarpa	black cottonwood	FACW	R
Prunella vulgaris	self heal	FAC	U
Pseudotsuga menziesii	Douglas-fir	NL	R
Ranunculus repens	buttercup	FACW	R
[illegible]aphanus sativus	radish	NL	U
[illegible]a sp.	hybrid rose	unknown	U

APPENDIX Y

Plant Species	Common Name	Wetland Status	Location
Rubus discolor	Himalayan blackberry	FACW	B
Rubus parviflorus	thimbleberry	FAC+	R
Rubus ursinus	California blackberry	FACW*	B
Rumex acetosella	sheep sorrel	FAC-	U
Rumex crispus	curly dock	FACW-	B
Salix alba	white willow	NL	R
Salix sp.	willow	unknown	R
Scirpus microcarpus	small-flowering bulrush	OBL	R
Scrophularia californica	figwort	FAC	B
Sequoia sempervirens	coast redwood	NL	R
Sonchus sp.	perennial sow thistle	FACU	U
Taraxacum officinale	dandelion	FACU	U
Thuja plicata	western red cedar	FAC+	R
Tolmiea menziesii	pig-a-back plant	OBL	R
Tragopogon porrifolius	salsify, oyster plant	NL	U
Trifolium dubium	little hop clover	FACU*	U
Trifolium repens	white clover	FACU+	U
Umbellularia californica	California bay	FAC	R
Vaccinium ovatum	evergreen huckleberry	NL	R
Vicia cracca	vetch	NL	U
Vicia sativa ssp. sativa	common vetch, spring vetch	FACU	U

Note: All nomenclature conforms to The Jepson Manual (Hickman, 1993)

Wetland Status Indicator:
- FACU=facultative upland
- FAC=facultative
- FACW=facultative wetland
- OBL=obligate wetland
- NL=not listed, generally considered upland
- Unknown= species not identified due to either absence of fruit and/or flower
- * = tentative assignment due to limited information

Location:
- R=riparian zone
- U=upland sites
- B=both upland and riparian

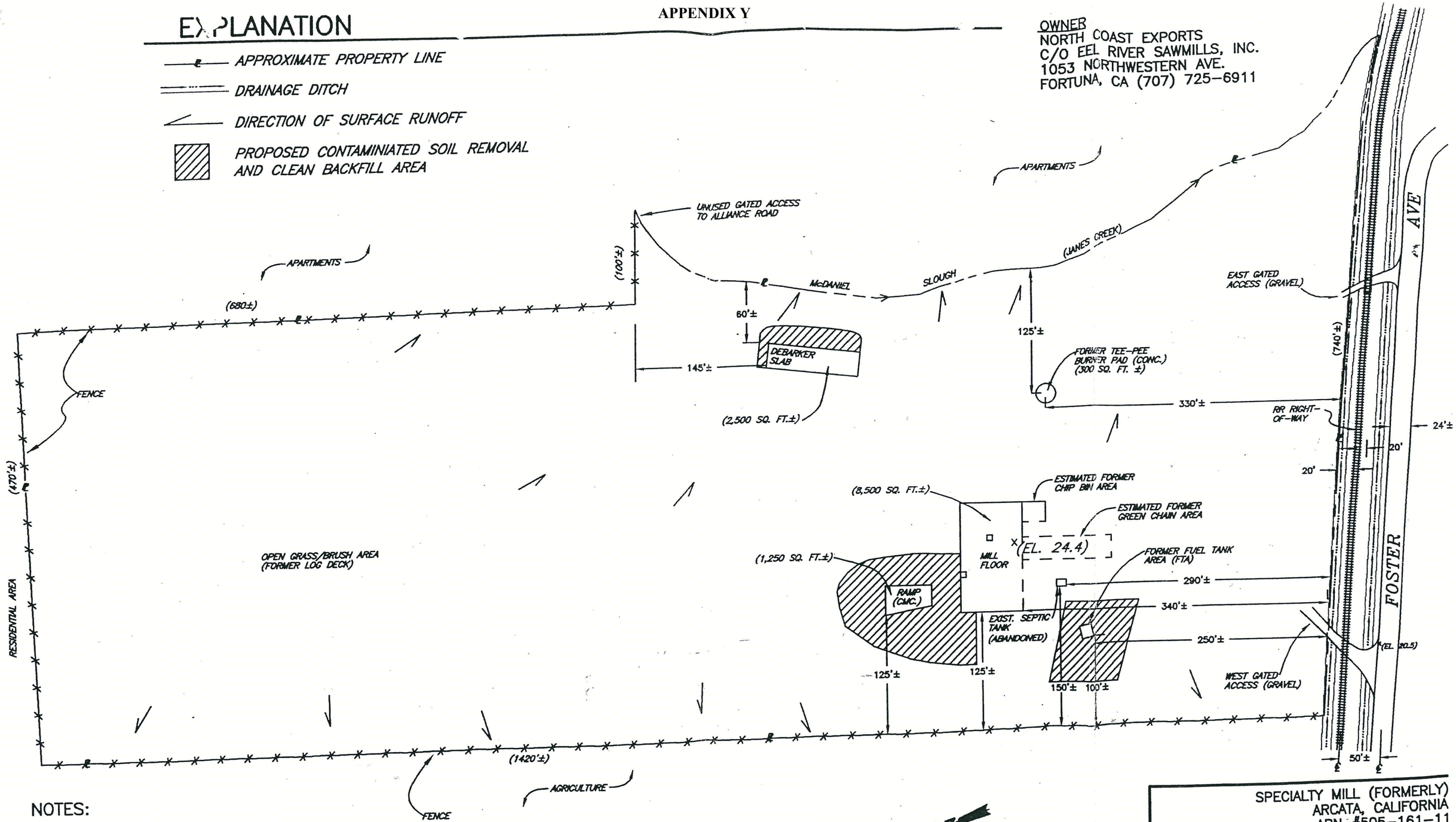
Birds Detected

Great Blue Heron (flying over)
Turkey Vulture
California Quail
Vaux's Swift
Chestnut-backed Chickadee
American Crow
Common Raven
Barn Swallow
Cliff Swallow
Marsh Wren
Eurasian Starling
Song Sparrow
Lazuli Bunting
Brown-headed Cowbird
American Goldfinch
Lesser Goldfinch
House Finch

EXPLANATION

- APPROXIMATE PROPERTY LINE
- DRAINAGE DITCH
- DIRECTION OF SURFACE RUNOFF
- PROPOSED CONTAMINIATED SOIL REMOVAL AND CLEAN BACKFILL AREA

OWNER
NORTH COAST EXPORTS
C/O EEL RIVER SAWMILLS, INC.
1053 NORTHWESTERN AVE.
FORTUNA, CA (707) 725-6911



NOTES:

1. SITE ADDRESS: 2000 FOSTER AVE., ARCATA
2. NO NEW STRUCTURES PLANNED
3. ONLY FORMER STRUCTURE CONCRETE SLABS REMAIN (SITES FACILITIES ABANDONED)
4. NO KNOWN SURVEY MONUMENTS
5. BACKFILL MATERIAL TO BE APPROVED BY ENGINEER – 85% RELATIVE COMPACTION
6. BACKFILL GRADING TO MATCH EXISTING

N

0 50 100 Feet

SCALE: 1" = 100'

ALL LOCATIONS ARE APPROXIMATE

SPECIALTY MILL (FORMERLY)
ARCATA, CALIFORNIA
APN #505-161-11

PLOT PLAN

SHN 930121.100
OCTOBER 1996

SHN

930121C2

Streamline Planning Consultants

• PLANNING • PERMITTING • ENVIRONMENTAL CONSULTING

Biological Report

for

Foster Avenue, Arcata, CA

APN: 505-161-011, 505-151-001, and 505-151-009

Photograph of the study area in Arcata, California.
Photograph taken in 2015.

May 17, 2016

for

Danco Communities
5251 Ericson Way
Arcata, CA 95521

Foster Avenue Biological Report

May 17, 2016

Summary:

A biological survey was performed by Streamline Planning Consultants (SPC) on approximately 21 acres in Humboldt County to assess the property for sensitive flora and fauna, and to characterize the vegetation found on-site and in the adjacent Janes Creek riparian area. The field work for the study was conducted on 07/15/15, 08/24/15, 02/15/16, 04/21/16, and 05/9/16. This report includes data from numerous site visits; however, the majority of the observations were completed on 04/21/16.

A Biological Assessment report was completed for parcel 505-161-011 in 2000 by Mad River Biologists (MRB 2000). However in the 16 years since the report was completed much can change. Site conditions vary from year to year, and plant communities shift. In addition to this, many species formerly on the Rare Threatened or Endangered (RTE) species list have been delisted, while other species have been added, reflecting new research and additional information on sensitive species. The original report was referred to and reviewed, however this report was completed independent of the findings of the 2000 report.

Site Description:

The study area (Assessor Parcel Numbers (APNs) 505-161-011, 505-151-001, and 505-151-009) is located within the Arcata North United States Geological Survey (USGS) 7.5' quadrangle within the northwest quarter of section 29 and the southwest quarter of section 20 of Township 6 North and Range 1 East. The study area occupies approximately 21 acres of bottomlands northwest of the center of Arcata. The majority of the site is more or less flat, sloping gradually toward Janes Creek, a small third order stream on the southeast side of parcel 505-161-011 Residential housing is located on the north and east side of the study area and agricultural fields, including parcel 505-151-001, lie to the west. A few scattered residences and Foster Avenue occur to the south of the study area.

Parcel 505-161-011 is approximately 16 acres and was historically used as a lumber mill (Van De Nor Mill). Although the site has been vacant since 1986, the past use has influenced the sites present environmental setting and plant communities. Fill (compacted river run gravel, gravelly silt, and wood debris) covers the parcel to varying depths and with differing degrees of compaction. Parcel 505-161-011 is characterized by non-native upland plants characteristic of degraded upland habitat. Sweet Vernal Grass (*Anthoxanthum odoratum*), Himalayan Blackberry (*Rubus armeniacus*), California Blackberry (*Rubus ursinus*), Italian Ryegrass (*Festuca perennis*), Poison Hemlock (*Conium maculatum*), Wild Teasel (*Dipsacus fullonum*), Small Fescue (*Festuca microstachys*), and Wild Oat (*Avena fatua*) were the most commonly observed plant species within the parcel. Depressions were characterized by Himalayan Blackberry (*Rubus armeniacus*), California Blackberry (*Rubus ursinus*), Wild Teasel, Spring Vetch (*Vicia sativa*), Canary Reedgrass (*Phalaris arundinacea*), Pennyroyal (*Mentha pulegium*), and Common Rush (*Juncus effuses*).

The small area of parcel 505-151-001 that was assessed in this study (0.14 acres in the northeastern corner of the parcel), is and has been historically used for agriculture. The area was heavily grazed and contained many domestic animals during the time of the survey. The site was dusty with large areas of bare soil. Vegetation found here primarily consisted of non-native species such as Sweet Vernal Grass (*Anthoxanthum odoratum*) and Orchard grass (*Dactylis glomerata*).

Parcel 505-151-009 is approximately 4.2 acres and has been historically used for agriculture. The parcel is currently vacant but contains a driveway access that is used for an adjacent community supported agriculture (CSA) operation on parcel 505-151-008. Parcel 505-151-009 has been planned to be developed as a park by the City of Arcata for several decades. Vegetation found here primarily consisted of non-native species such as Sweet Vernal Grass, Orchard grass, Italian Wildrye (*Festuca perennis*), Soft Chess (*Bromus hordeacus*), and Wild Radish (*Raphanis sativum*) among others.

Methods:

Potential RTE species were determined prior to site visits of the study area using the following sources of information: 1) all those listed as rare or endangered by the U.S. Fish and Wildlife Service, or which are candidates for listing; 2) all species designated as rare, threatened, or endangered by the California Fish and Wildlife Department and listed in the California Natural Diversity Database (CNDDB); and 3) all plants listed in the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Plants of California (2016).

Site visits of the study area were conducted on 07/15/15, 08/24/15, 02/15/16, 04/21/16, and 05/9/16. Multiple site visits were conducted in order to detect rare species at the time when they are most observable. Site visits included traversing the entire study area, with greater attention given to wet pockets, depressions, and the Janes Creek riparian area. Several of the site visits included detailed wetland observations including sample pits (See Foster Avenue Wetland Delineation SPC 2016) in addition to increased scrutiny of the vegetation within each wet area. The survey on 04/21/16 included additional scrutiny for bird species and flower blooms on site. All plant and animal species observed on site were recorded if possible to species (See Attachment 2). The Janes Creek riparian habitat was more intensely scrutinized for this report, which included traversing both sides of the stream channel and crossing the creek in numerous locations. Instream surveys for aquatic organisms were not conducted as part of this report.

Limitations:

While every attempt was made to identify vegetation down to species during the site visits in July, August, February, April, and May, there were still some species that were dormant, or simply vegetative making it difficult to identify definitively. Due to the low quality of habitat on site, and the overwhelming dominance by non-native species it is unlikely that any RTE species were missed, or miss-identified.

Results:

Species found on parcel 505-161-011 reflect the former industrial use of the parcel and the continued disturbed nature of the site. The majority of the site is characterized by non-native vegetation, over areas of compacted gravel, and uneven fill. The entire northern portion of the parcel, the former log deck, is covered by an extensive Himalayan Blackberry (*Rubus armeniacus*) thicket. The dense cover precludes the existence of many other species. A small stand of Arroyo Willow (*Salix lasiolepis*), within the center of this thicket, was visited during one of the site visits. While this small willow stand does offer varied bird habitat, English Ivy (*Hedera helix*) was found growing under the canopy preventing the growth of other species.

The central and southern portion of parcel 505-161-011 was dominated by a mosaic of disturbed grassland, Rubus thickets, and small willow stands over compacted gravel, with randomly located water retaining depressions resulting from uneven compaction of fill. Numerous grass species were observed within this portion of the parcel in addition to large stands of Poison Hemlock (*Conium maculatum*), Wild Teasel (*Dipsacus fulonum*), and Blackberry species (*Rubus ursinus* and *Rubus armeniacus*). Depressions often had higher proportions of wetland plants such as Pennyroyal (*Mentha pulegium*) and Juncus species. Both Red-tailed Hawk (Buteo jamaicensis) and the White-tailed Hawk (Elanus leucurus) where observed hunting within the more open southern portion of the parcel. Barn Swallows (*Hirundo rustica*) and Vaux's Swifts (*Chaetura vauxi*) were seen foraging above the parcel and over the adjacent agricultural fields. The House Wren (*Troglodytes aedon*), Yellow Warbler (*Setophaga petechia*), and Bushtit (*Psaltriparus minimus*) were observed in the brush along the edge of the parcel and Wilson's Snipe (*Gallinago delicata*) was seen flying out of one of the wet pockets in the center of the parcel.

The portion of parcel 505-161-011 along Janes Creek was characterized by a fairly well developed canopy and well defined stream channel. The current condition of this section of Janes Creek is significantly influenced by a riparian restoration project conducted by Redwood Community Action Agency (RCAA) in 1995 which included the following components: 1) cutting back of the creek banks and terracing the slope to increase flood capacity; 2) placement of in-stream structures to improve channel complexity for fish habitat; and 3) removal of non-native species and replacement with native species (Mad River Biologists 2000). It appeared during the site visits that maintenance of the restoration area had not been performed for some time. Many of the species observed within the Janes Creek riparian corridor were planted as part of the restoration project including Red Alder (*Alnus rubra*), Bigleaf Maple (*Acer macrophyllum*), Sitka Spruce (*Picea sitchensis*), and Black Cottonwood (*Populus trichocarpa*) among others. Prior to the restoration project, the area was covered by Himalayan Blackberry and Canary Reedgrass (*Phalaris arundinaceae*). These invasive species still exist on site, but have been greatly reduced by the expanding canopy. Other species observed along Janes Creek include English Ivy, Cleaver Plant (*Galium aparine*), Poison Hemlock, Creeping Buttercup (*Ranunculus repens*) and Pacific and Sitka Willows (*Salix lasiandra* and *Salix lasiolepis*). Wildlife observed within the riparian area included the Barred Owl (*Strix varia*) (observed roosting within a Mayten tree within the creek channel), the American Robin (*Turdus migratorius*), and numerous water-dependent insect species. No fish species were observed

during the site visits conducted for this report. As noted in the Methods section above, in-stream surveys for aquatic organisms were not conducted. Previous in-stream surveys (e.g. McDaniel Slough draft EIR 2006) have determined that fish species are present within Janes Creek.

Parcels 505-151-001, and 505-151-009 were characterized by weedy non-native species typical of agricultural fields within the Arcata Bottoms. Species observed include Sweet Vernal Grass, Orchard Grass, Italian Wildrye, Soft Chess, Blessed Milk Thistle (*Silybum marianum*) and Wild Radish among others. Parcel 505-151-009 was densely vegetated with grasses and forbs reaching up to 2 feet in height. The portion of parcel 505-151-001 included within the study area was overgrazed, showing many areas of bare dirt.

Conclusion:

No rare, threatened, or sensitive plant or animal species were observed within the study area on any of the site visits. A complete list of the plant and animal species observed in the study area are listed in Attachments 2 and 3. Species observed on-site were characteristic of a disturbed landscape. Of the 110 plant species observed within the project area, 37 were native species and 73 were non-native species. This is the equivalent of 34% native and 66% non-native plant cover. Animal species observed were those more adapted to open disturbed areas. Many of the bird species observed prefer open fields in which to hunt or thickets where they can seek shelter. Both of these habitat types were exhibited on-site. State or Federally Listed species or species of special concern are not expected to exist in the study area due to the lack of habitat and the disturbed nature of the area.

Although, no RTE wildlife species were observed during the site visits conducted for this report, portions of the study area such as the Janes Creek riparian corridor do contain habitat for some of these species. As such it is recommended that a focused survey for wildlife species be conducted by a qualified biologist prior to ground disturbing activities for any future development within the study area.

Attachments:

Attachment 1: Site Map
Attachment 2: Plant Species Observed in the Study Area
Attachment 3: Animal Species Observed in the Study Area
Attachment 4: CNDDB Listed Species for the Arcata North and surrounding Quadrants
Attachment 5: CNPS Listed Species

References:

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U.S. Fish and Wildlife Service. (Accessed May 2016). Environmental Conservation Online System. Accessed at: http://ecos.fws.gov/ecp/

Attachment 1:

Site Map

APPENDIX Z

Attachment 2:

Plant Species Observed

APPENDIX Z

PLANTS OBSERVED ON-SITE (FOSTER AVENUE ANNEX)					
Listing	**Scientific Name**	**Common Name**	**Native**	**Wtlnd Stat.**	**Location***
	TREES				
	Acer macrophylla	Bigleaf Maple	Y	FACU	R
	Alnus rubra	Red Alder	Y	FAC	R
	Crataegus monogyna	English Hawthorne	N	FAC	U,P
	Ilex aquifolium	English Holly	N	FACU	R
	Malus sp.	Cultivated Apple	N	NI	U
	Maytenus boaria	Mayten Tree	N	NL	R
	Picea sitchensis	Sitka Spruce	Y	FAC	R
	Pinus contorta ssp. contorta	Shore Pine	Y	NL	R
	Populus nigra	Lombardy Poplar	N	NL	U
	Populus trichocarpa	Black Cottonwood	Y	NL	R
	Prunus sp.	Cultivated Plum	N	NI	U
	Prunus sp.	Cultivated Cherry	N	NI	U
	Prunus cerasifera var. pissardii	Flowering Plum	N	FACU	U
	Pseudotsuga menziesii	Douglas Fir	Y	FACU	R
	Salix lasiolepis	Arroyo Willow	Y	FACW	R,U
	Salix lasiandra	Pacific Willow	Y	FACW	R
	Sambucus nigra	Black Elderberry	Y	FAC	P
	Sambucus racemosa	Red Elderberry	Y	FACU	R
	Sequoia Sempervirens	Coast Redwood	Y	UPL	R
	Thuja plicata	Western Redcedar	Y	FAC	R
	SHRUBS/VINES				
	Cotoneaster franchetii	Cotoneaster	N	UPL	U
	Genista monspessulana	French Broom	N	UPL	U
	Hedera helix	English Ivy	N	FACU	R,U
	Lupinus rivularis	Riverbank Lupine	Y	FAC	U

APPENDIX Z

Listing	Scientific Name	Common Name	Native	Wtlnd Stat.	
	Rubus armeniacus	Himalayan Blackberry	N	FACU	R,U,P
	Rubus ursinus	Pacific Bramble; California Blackberry	Y	FACU	R,U
	Rosa nutkana	Nootka Rose	Y	FAC	R,U
	HERBS				
	Allium triquetrum	Wild Onion	N	NL	R,U
	Bellis perennis	English Daisy	N	NL	P
	Borago officinalis	Common Borage	N	NL	P
	Brassica rapa	Mustard	N	FACU	P
	Carthamus lanatus	Distaff Thistle	N	UPL	U
	Chamerion angustifolium	Fireweed	Y	FACU	U
	Cirsium vulgare	Bull Thistle	N	FACU	R,U,P
	Conium maculatum	Poison Hemlock	N	FAC	R,U,P
	Convolvulus arvensis	Field Bindweed	N	FACU	U,P
	Cortaderia selloana	Pampus Grass	N	FACU	R
	Daucus carota	Wild Carrot or Queen Anne's Lace	N	FACU	U,P
	Dipsacus fullonum	Wild Teasal	N	FAC	U
	Epilobium ciliatum	Fringed Willow Herb	Y	NI	U
	Euphorbia lathyris	Gopher Plant	N	UPL	U
	Euphorbia virgata	Leafy Spurge	N	UPL	U
	Foeniculum vulgare	Fennel	N	NI	U
	Galium aparine	Cleavers	Y	FACU	R,U
	Geranium dissectum	Cut-leaved Geranium	N	FACU	U,P
	Helminthotheca echioides	Bristly Oxe-tongue	N	FAC	U
	Hemizonia congesta	Hayfield Tarweed	Y	NI	U
	Hypochaeris radicata	Hairy Cats-ear	N	FACU	U
	Juncus bufonius	Common Toad Rush	Y	FACW	U,P
	Juncus effuses	Common Rush	Y	FACW	U
	Juncus patens	Spreading Rush	Y	FACW	U

APPENDIX Z

Listing	Scientific Name	Common Name	Native	Wtlnd Stat.	
	Lamium purpureum	Henbit	N	NL	U
	Leucanthemum vulgare	Oxeye Daisy	N	FACU	U
	Linum bienne	Narrow Leaved Flax	N	UPL	U,P
	Lotus corniculatus	Birds Foot Trefoil	N	FAC	U
	Lysimachia arvensis	Scarlet Pimpernel	N	FAC	U
	Malva parviflora	Cheeseweed Mallow	N	UPL	P
	Matricaria discoidea	Pineapple Weed	Y	FACU	P
	Medicago polymorpha	Bur-clover	N	FACU	P
	Mentha pulegium	Pennyroyal	N	OBL	U
	Mentha spicata	Spearmint	N	FACW	P
	Myosotis latifolia	Forget-me-not	N	UPL	R
	Plantago lanceolata	English Plantain	N	FACU	U,P
	Plantago major	Broadleaf Plantain	N	FAC	P
	Ranunculus repens	Creeping Buttercup	N	FAC	R,U,P
	Raphanus sativus	Wild Radish	N	UPL	R,U,P
	Rumex acetosella	Sheep Sorrel	N	FACU	R,P
	Rumex crispus	Curly Dock	N	FAC	R,U,P
	Rumex pulcher	Fiddle Dock	N	FAC	P
	Scrophularia californica	Bee Plant	Y	FAC	R,U
	Silybum marianum	Blessed Milk-thistle	N	NL	P
	Sonchus oleraceus	Common Sow Thistle	N	UPL	U,P
	Symphyotrichum chilense	Pacific Aster	Y	FAC	U
	Taraxacum officinale	Dandelion	N	FACU	U,P
	Tragopogon porrifolius	Purple Salsify	N	NI	U
	Trifolium dubium	Suckling Clover	N	FACU	U
	Trifolium hybridum	Alsike Clover	N	FAC	U,P
	Trifolium pratense	Red Clover	N	FACU	U
	Trifolium repens	White Clover	N	FAC	P

APPENDIX Z

Listing	Scientific Name	Common Name	Native	Wtlnd Stat.	
	Typha latifolia	Cattails	Y	OBL	U
	Veronica beccabunga	European Speedwell	N	OBL	R
	Vicia hirsuta	Tiny Vetch	N	UPL	U
	Vicia sativa	Spring Vetch	N	UPL	U,P
	Viola odorata	English Violet	N	NL	R
	FERNS and Allies				
	Athyrium filix-femina	Lady Fern	Y	FAC	R,U
	Equisetum arvense	Horse Tail	Y	FACW	R,U
	Equisetum telmateia	Giant Horse Tail	Y	FACW	U
	Polystichum munitum	Swordfern	Y	FACU	R
	GRASSES				
	Anthoxanthum odoratum	Sweet Vernal Grass	N	FACU	U,P
	Avena fatua	Wild Oat	N	UPL	U
	Briza major	Rattlesnake Grass	N	UPL	U
	Briza minor	Little Quacking Grass	N	FAC	U
	Bromus carinatus	California Bromegrass	Y	UPL	U,P
	Bromus diandrus	Ripgut Brome	N	UPL	U
	Bromus hordeaceus	Soft Chess	N	FACU	R,U,P
	Bromus racemosus	Smooth Brome	N	UPL	U
	Dactylis glomerata	Orchard Grass	N	FACU	U,P
	Festuca arundinaceae	Tall Fescue	N	NI	U
	Festuca microstachys	Small Fescue	Y	NI	U
	Festuca perennis	Italian Ryegrass	N	FAC	U,P
	Holcus lanatus	Common Velvet Grass	N	FAC	U,P
	Hordeum brachyantherum	Meadow Barley	Y	FACW	U
	Glyceria declinata	Waxy Mannagrass	N	FACW	U
	Phalaris arundinacea	Canary Reed Grass	N	FACW	R,U
	Poa annua	Annual Grass	N	FAC	U

APPENDIX Z

Listing	Scientific Name	Common Name	Native	Wtlnd Stat.	
	Poa pratensis	Kentucky Bluegrass	N	FAC	U,P
	SEDGES				
	Carex leptopoda	Slender-footed Sedge	Y	FAC	R
	Carex pachystachya	Chamisso Sedge	Y	FAC	U
	Cyperus eragrostis	Flat sedge	Y	FACW	R,U
	Scirpus microcarpus	Panicled Bulrush	Y	OBL	R

*Location: R=Riparian
U=Upland/fill area
P=Park Site

Attachment 3:

Animal Species Observed

APPENDIX Z

Listing	Scientific Name	Common Name	Native
	INSECTS		
	Aphrophora sp.	Spittlebug Species	Y
	Armadillidum vulgare	Sow Bugs	N
	Culicidae sp.	Mosquito species	Y
	Gerris remigis	Water Strider	Y
	Helophilus fasciatus	Solitary Bee	Y
	Musca domestica	Common House Fly	Y
	Vanessa annabella	West Coast Lady	Y
	BIRDS		
	Buteo jamaicensis	Red-tailed Hawk	Y
	Cathartes aura	Turkey Vulture	Y
	Chaetura vauxi	Vaux's Swift	Y
	Corvus brachyrhynchos	Crow	Y
	Elanus leucurus	White-tailed Kite	Y
	Gallinago delicata	Wilson's Snipe	Y
	Hirundo rustica	Barn Swallow	Y
	Psaltriparus minimus	Bushtit	Y
	Setophaga petechia	Yellow Warbler	Y
	Strix varia	Barred Owl	N
	Troglodytes aedon.	House Wren	Y
	Turdus migratorius	American Robin	Y
	REPTILES/AMPHIBIANS		
	Plestiodon skiltonianus	Western Skink	Y
	Pseudacris triseriata	Western Chorus Frog	Y
	MAMMELS		
	Thomomys bottare	Pocket Gopher	Y

Attachment 4:

CNDDB Listed Species for the Arcata North and Surrounding Quadrants

APPENDIX Z

SciName	ComName	FedList	CalList	SRank	RPlantRank	Habitats	GenHab	MicroHab
Acipenser medirostris	**green sturgeon**	Threatened	None	S1S2		Aquatic | Klamath/North coast flowing waters | Sacramento/San Joaquin flowing waters	These are the most marine species of sturgeon. Abundance increases northward of Point Conception. Spawns in the Sacramento, Klamath, & Trinity Rivers.	Spawns at temps between 8-14 C. Preferred spawning substrate is large cobble, but can range from clean sand to bedrock.
Arborimus albipes	**white-footed vole**	None	None	S2S3		North coast coniferous forest | Redwood | Riparian forest	Mature coastal forests in Humboldt & Del Norte counties. Prefers areas near small, clear streams with dense alder & shrubs.	Occupies the habitat from the ground surface to the canopy. Feeds in all layers & nests on the ground under logs or rock.
Ardea alba	**great egret**	None	None	S4		Brackish marsh | Estuary | Freshwater marsh | Marsh & swamp | Riparian forest | Wetland	Colonial nester in large trees.	Rookery sites located near marshes, tide-flats, irrigated pastures, and margins of rivers and lakes.
Ardea herodias	**great blue heron**	None	None	S4		Brackish marsh | Estuary | Freshwater marsh | Marsh & swamp | Riparian forest | Wetland	Colonial nester in tall trees, cliffsides, and sequestered spots on marshes.	Rookery sites in close proximity to foraging areas: marshes, lake margins, tide-flats, rivers and streams, wet meadows.
Bryoria spiralifera	**twisted horsehair lichen**	None	None	S1S2	1B.1	North coast coniferous forest	North coast coniferous forest.	Usually on conifers. 0-30 m.

APPENDIX Z

SciName	ComName	FedList	CalList	SRank	RPlantRank	Habitats	GenHab	MicroHab
Carex lenticularis var. limnophila	**lagoon sedge**	None	None	S1	2B.2	Bog & fen | Marsh & swamp | North coast coniferous forest	Bogs and fens, marshes and swamps, north coast coniferous forest.	Lakeshores, beaches. Often in gravelly substrates. 0-6 m.
Carex leptalea	**bristle-stalked sedge**	None	None	S1	2B.2	Bog & fen | Freshwater marsh | Marsh & swamp | Meadow & seep | Wetland	Bogs and fens, meadows, marshes and swamps, meadows and seeps.	Mostly known from bogs and wet meadows. 0-700 m.
Carex lyngbyei	**Lyngbye's sedge**	None	None	S3	2B.2	Marsh & swamp | Wetland	Marshes and swamps (brackish or freshwater).	0-200 m.
Carex viridula ssp. viridula	**green yellow sedge**	None	None	S2	2B.3	Bog & fen | Marsh & swamp | North coast coniferous forest | Wetland	Bogs and fens, marshes and swamps (freshwater), North Coast coniferous forest.	Mesic sites. 0-1600 m.
Castilleja ambigua var. humboldtiensis	**Humboldt Bay owl's-clover**	None	None	S2	1B.2	Marsh & swamp | Salt marsh | Wetland	Coastal salt marsh.	In coastal saltmarsh with Spartina, Distichlis, Salicornia, Jaumea. 0-3 m.
Castilleja mendocinensis	**Mendocino Coast paintbrush**	None	None	S2	1B.2	Closed-cone coniferous forest | Coastal bluff scrub | Coastal dunes | Coastal prairie | Coastal scrub	Coastal bluff scrub, coastal scrub, coastal prairie, closed-cone coniferous forest, coastal dunes.	Often on sea bluffs or cliffs in coastal bluff scrub or prairie. 0-160 m.
Charadrius alexandrinus nivosus	**western snowy plover**	Threatened	None	S2		Great Basin standing waters | Sand shore | Wetland	Sandy beaches, salt pond levees, & shores of large alkali lakes.	Needs sandy, gravelly, or friable soils for nesting.
Chloropyron maritimum ssp. palustre	**Point Reyes salty bird's-beak**	None	None	S2	1B.2	Marsh & swamp | Salt marsh | Wetland	Coastal salt marsh.	Coastal salt marsh Sali-cornia, Distichlis, Jau-mea, Spartina 0-10 m.

SciName	ComName	FedList	CalList	SRank	RPlantRank	Habitats	GenHab	MicroHab
Corynorhinus townsendii	**Townsend's big-eared bat**	None	Candidate Threatened	S2		Broadleaved upland forest | Chaparral | Chenopod scrub | Great Basin grassland | Great Basin scrub | Joshua tree woodland | Lower montane coniferous forest | Meadow & seep | Mojavean desert scrub | Riparian forest | Riparian woodland | Sonoran desert scrub | Sonoran thorn woodland | Upper montane coniferous forest | Valley & foothill grassland	Throughout California in a wide variety of habitats. Most common in mesic sites.	Roosts in the open, hanging from walls & ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.
Egretta thula	**snowy egret**	None	None	S4		Marsh & swamp | Meadow & seep | Riparian forest | Riparian woodland | Wetland	Colonial nester, with nest sites situated in protected beds of dense tules.	Rookery sites situated close to foraging areas: marshes, tidal-flats, streams, wet meadows, and borders of lakes.
Empetrum nigrum	**black crowberry**	None	None	S1?	2B.2	Coastal bluff scrub | Coastal prairie	Coastal bluff scrub, coastal prairie.	3-15 m.

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SciName	**ComName**	FedList	CalList	SRank	RPlantRank	Habitats	GenHab	MicroHab
Emys marmorata	**western pond turtle**	None	None	S3		Aquatic | Artificial flowing waters | Klamath/North coast flowing waters | Klamath/North coast standing waters | Marsh & swamp | Sacramento/San Joaquin flowing waters | Sacramento/San Joaquin standing waters | South coast flowing waters | South coast standing waters | Wetland	A thoroughly aquatic turtle of ponds, marshes, rivers, streams & irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation.	Need basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.
Eucyclogobius newberryi	**tidewater goby**	Endangered	None	S3		Aquatic | Klamath/North coast flowing waters | Sacramento/San Joaquin flowing waters | South coast flowing waters	Brackish water habitats along the Calif coast from Agua Hedionda Lagoon, San Diego County to the mouth of the Smith River.	Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water & high oxygen levels.
Fissidens pauperculus	**minute pocket moss**	None	None	S2	1B.2	North coast coniferous forest | Redwood	North coast coniferous forest.	Moss growing on damp soil along the coast. In dry streambeds and on stream banks. 10-1024 m.
Gilia capitata ssp. pacifica	**Pacific gilia**	None	None	S2	1B.2	Chaparral | Coastal bluff scrub | Coastal prairie | Valley & foothill grassland	Coastal bluff scrub, chaparral, coastal prairie, valley and foothill grassland.	5-1330 m.

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SciName	**ComName**	FedList	CalList	SRank	RPlantRank	Habitats	GenHab	MicroHab
Hesperevax sparsiflora var. brevifolia	**short-leaved evax**	None	None	S2	1B.2	Coastal bluff scrub | Coastal dunes | Coastal prairie	Coastal bluff scrub, coastal dunes, coastal prairie.	Sandy bluffs and flats. 0-215 m.
Juncus nevadensis var. inventus	**Sierra rush**	None	None	S1	2B.2	Bog & fen | Wetland	Bogs and fens.	0-10 m.
Lathyrus palustris	**marsh pea**	None	None	S2	2B.2	Bog & fen | Coastal prairie | Coastal scrub | Lower montane coniferous forest | Marsh & swamp | North coast coniferous forest | Wetland	Bogs & fens, lower montane coniferous forest, marshes and swamps, north coast coniferous forest, coastal prairie, and coastal scrub.	Moist coastal areas. 1-100 m.
Lilium occidentale	**western lily**	Endangered	Endangered	S1	1B.1	Bog & fen | Coastal bluff scrub | Coastal prairie | Coastal scrub | Freshwater marsh | Marsh & swamp | North coast coniferous forest | Wetland	Coastal scrub, freshwater marsh, bogs and fens, coastal bluff scrub, coastal prairie, North Coast coniferous forest, marshes and swamps.	Well-drained, old beach washes overlain with wind-blown alluvium and organic topsoil; usually near margins of Sitka spruce. 2-185 m.
Lycopodiella inundata	**inundated bog-clubmoss**	None	None	S1?	2B.2	Bog & fen | Lower montane coniferous forest | Marsh & swamp | Wetland	Bogs and fens, lower montane coniferous forest, marshes and swamps.	Peat bogs, muddy depressions, pond margins. 5-1000 m.
Monotropa uniflora	**ghost-pipe**	None	None	S2	2B.2	Broadleaved upland forest | North coast coniferous forest	Broadleaved upland forest, North coast coniferous forest.	Often under redwoods or western hemlock. 10-550 m.
Montia howellii	**Howell's montia**	None	None	S3	2B.2	Meadow & seep | North coast coniferous forest | Vernal pool |	Meadows, north coast coniferous forest, vernal pools.	Vernally wet sites; often on compacted soil. 0-835 m.

SciName	**ComName**	FedList	CalList	SRank	RPlantRank	Habitats	GenHab	MicroHab
						Wetland		
Nycticorax nycticorax	**black-crowned night heron**	None	None	S4		Marsh & swamp | Riparian forest | Riparian woodland | Wetland	Colonial nester, usually in trees, occasionally in tule patches.	Rookery sites located adjacent to foraging areas: lake margins, mud-bordered bays, marshy spots.
Oenothera wolfii	**Wolf's evening-primrose**	None	None	S1	1B.1	Coastal bluff scrub | Coastal dunes | Coastal prairie	Coastal bluff scrub, coastal dunes, coastal prairie, lower montane coniferous forest.	Sandy substrates; usually mesic sites. 3-800 m.
Oncorhynchus clarkii clarkii	**coast cutthroat trout**	None	None	S3		Aquatic | Klamath/North coast flowing waters	Small coastal streams from the Eel River to the Oregon border.	Small, low gradient coastal streams & estuaries. Need shaded streams with water temps <18C, & small gravel for spawning
Oncorhynchus kisutch	**coho salmon - southern Oregon / northern California ESU**	Threatened	Threatened	S2?		Aquatic | Klamath/North coast flowing waters | Sacramento/San Joaquin flowing waters	Federal listing refers to populations between Cape Blanco, Oregon & Punta Gorda, Humboldt County, California.	State listing refers to populations between the Oregon border & Punta Gorda, California.
Pandion haliaetus	**osprey**	None	None	S4		Riparian forest	Ocean shore, bays, fresh-water lakes, and larger streams.	Large nests built in tree-tops within 15 miles of a good fish-producing body of water.
Phalacrocorax auritus	**double-crested cormorant**	None	None	S4		Riparian forest | Riparian scrub | Riparian woodland	Colonial nester on coastal cliffs, offshore islands, & along lake margins in the interior of the state.	Nests along coast on sequestered islets, usually on ground with sloping surface, or in tall trees along lake margins.
Polemonium	**Oregon**	None	None	S2	2B.2	Coastal prairie |	Coastal prairie, coastal	0-1830 m.

SciName	**ComName**	FedList	CalList	SRank	RPlantRank	Habitats	GenHab	MicroHab
carneum	**polemonium**					Coastal scrub | Lower montane coniferous forest	scrub, lower montane coniferous forest.	
Rana aurora	**northern red-legged frog**	None	None	S3		Klamath/North coast flowing waters | Riparian forest | Riparian woodland	Humid forests, woodlands, grasslands, & streamsides in northwestern California, usually near dense riparian cover.	Generally near permanent water, but can be found far from water, in damp woods and meadows, during non-breeding season.
Rhyacotriton variegatus	**southern torrent salamander**	None	None	S2S3		Lower montane coniferous forest | Oldgrowth | Redwood | Riparian forest	Coastal redwood, Douglas-fir, mixed conifer, montane riparian, and montane hardwood-conifer habitats. Old growth forest.	Cold, well-shaded, permanent streams and seepages, or within splash zone or on moss-covered rock within trickling water.
Riparia riparia	**bank swallow**	None	Threatened	S2		Riparian scrub | Riparian woodland	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert.	Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting hole.
Sidalcea malachroides	**maple-leaved checkerbloom**	None	None	S3	4.2	Broadleaved upland forest | Coastal prairie | Coastal scrub | North coast coniferous forest | Riparian forest	Broadleafed upland forest, coastal prairie, coastal scrub, north coast coniferous forest, riparian forest.	Woodlands and clearings near coast; often in disturbed areas. 0-730 m.
Sidalcea malviflora ssp. patula	**Siskiyou checkerbloom**	None	None	S2	1B.2	Coastal bluff scrub | Coastal prairie | North coast coniferous forest	Coastal bluff scrub, coastal prairie, north coast coniferous forest.	Open coastal forest; roadcuts. 5-1255 m.

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SciName	**ComName**	FedList	CalList	SRank	RPlantRank	Habitats	GenHab	MicroHab
Sidalcea oregana ssp. eximia	**coast sidalcea**	None	None	S1	1B.2	Lower montane coniferous forest | Meadow & seep | North coast coniferous forest | Wetland	Meadows and seeps, North Coast coniferous forest, lower montane coniferous forest.	Nears meadows, in gravelly soil. 5-1340 m.
Spergularia canadensis var. occidentalis	**western sand-spurrey**	None	None	S1	2B.1	Marsh & swamp | Wetland	Coastal salt marsh.	0-3 m.
Sphagnum Bog	**Sphagnum Bog**	None	None	S1.2		Bog & fen | Wetland		
Viola palustris	**alpine marsh violet**	None	None	S1S2	2B.2	Bog & fen | Coastal scrub | Wetland	Coastal scrub, bogs and fens.	Swampy, shrubby places in coastal scrub or coastal bogs. 0-150 m.

Attachment 5:

CNPS Listed Plant Species for the Arcata North and Surrounding Quadrants

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scientific	family	CNPS	R-E-D	STATE	State Rank	FEDERAL	Global Rank
Astragalus pycnostachyus var. pycnostachyus	Fabaceae	List 1B.2	3-2-3	None	S2	None	G2T2
Bryoria pseudocapillaris	Parmeliaceae	List 3.2		None	S2	None	G3
Bryoria spiralifera	Parmeliaceae	List 1B.1		None	S1S2	None	G3
Carex arcta	Cyperaceae	List 2B.2	2-2-1	None	S1	None	G5
Carex lenticularis var. limnophila	Cyperaceae	List 2B.2	3-2-1	None	S1	None	G5T5
Carex leptalea	Cyperaceae	List 2B.2	3-2-1	None	S1	None	G5
Carex lyngbyei	Cyperaceae	List 2B.2	2-2-1	None	S3	None	G5
Carex praticola	Cyperaceae	List 2B.2	2-2-1	None	S2	None	G5
Carex viridula ssp. viridula	Cyperaceae	List 2B.3		None	S1.3	None	G5T5
Castilleja ambigua var. humboldtiensis	Orobanchaceae	List 1B.2		None	S2	None	G4T2
Castilleja litoralis	Orobanchaceae	List 2B.2		None	S3	None	G4G5T4
Castilleja mendocinensis	Orobanchaceae	List 1B.2	2-2-2	None	S2	None	G2
Chloropyron maritimum ssp. palustre	Orobanchaceae	List 1B.2		None	S2	None	G4?T2
Discelium nudum	Disceliaceae	List 2B.2	3-2-1	None	S1	None	G4G5
Empetrum nigrum	Empetraceae	List 2B.2		None	S1?	None	G5
Erysimum menziesii	Brassicaceae	List 1B.1		Endangered	S1	Endangered	G1
Erythronium oregonum	Liliaceae	List 2B.2		None	S2	None	G5
Erythronium revolutum	Liliaceae	List 2B.2	2-2-1	None	S3	None	G4G5
Fissidens pauperculus	Fissidentaceae	List 1B.2	2-2-3	None	S2	None	G3?
Gilia capitata ssp. pacifica	Polemoniaceae	List 1B.2	2-2-2	None	S2	None	G5T3
Gilia millefoliata	Polemoniaceae	List 1B.2	2-2-2	None	S2	None	G2
Hesperevax sparsiflora var. brevifolia	Asteraceae	List 1B.2	2-2-1	None	S2	None	G4T3
Juncus nevadensis var. inventus	Juncaceae	List 2B.2		None	S1	None	G4
Lathyrus palustris	Fabaceae	List 2B.2	2-2-1	None	S2	None	G5
Lilium occidentale	Liliaceae	List 1B.1	3-3-2	Endangered	S1	Endangered	G1
Montia howellii	Montiaceae	List 2B.2	3-2-1	None	S2	None	G3G4
Oenothera wolfii	Onagraceae	List 1B.1	3-3-2	None	S1	None	G2
Piperia candida	Orchidaceae	List 1B.2	1-1-1	None	S3	None	G3
Polemonium carneum	Polemoniaceae	List 2B.2		None	S2	None	G3G4
Romanzoffia tracyi	Boraginaceae	List 2B.3	3-1-1	None	S2	None	G4
Sidalcea malviflora ssp. patula	Malvaceae	List 1B.2	3-2-2	None	S2	None	G5T2
Trichodon cylindricus	Ditrichaceae	List 2B.2	2-2-1	None	S2	None	G4
Viola palustris	Violaceae	List 2B.2	3-2-1	None	S1S2	None	G5

Streamline Planning Consultants • PLANNING • PERMITTING • ENVIRONMENTAL CONSULTING

Foster Avenue Wetland Delineation

February 24, 2016

Summary:

A wetland delineation was performed by Streamline Planning Consultants (SPC) on approximately 16 acres of parcel 505-161-011 (2000 Foster Avenue) and on a small strip of parcel 505-151-001 in Humboldt County to determine the extent of wetland cover on the site. The field work for the study was conducted on 07/15/15, 07/16/15, 08/24/15, 10/09/15, and 2/15/16. Four types of wetlands were delineated on site including: 1) 1-parameter depressions; 2) 2-parameter isolated wet patches; 3) 3-parameter isolated wet pockets; and 4) 3-parameter man-made ditches on either side of the railroad right of way (See Table 1 – Wetland Coverage Area by Type and Att. 4 –Wetland Map). Many of these wet areas are of low quality habitat value as indicated by the overwhelming presence of invasive species such as Poison Hemlock (*Conium maculatum*), Pennyroyal (*Menthe pulegium*), and Himalayan Blackberry (*Rubus armenicus*), as well as evidence of continued disturbance with tire tracks, mowing and large amounts of garbage within the wet areas. This delineation included thorough site evaluation using the U.S. Army Corps of Engineers three parameters of hydrophytic vegetation, wetland hydrology and hydric soils. Table 2 (Summary of Parameters Met at Each Sampling Point) lists which of these parameters were met at each assessment location (See below).

A wetland delineation report was completed for this site in 2004 by Natural Resource Management Corporation (NRM 2004). However in the 12 years since the report was completed much can change. Site conditions vary from year to year, plant communities shift, and site hydrology can be altered. In addition to this laws governing wetland protection and designation are constantly shifting, reflecting new research and additional information on wetland communities. The original report was referred to and reviewed, however this report was completed independent of the findings of the 2004 report.

Site Description:

The study area (APNs 505-161-011 & 505-151-001) is located within the Arcata North USGS 7.5' quadrangle within the northwest ¼ of section 29 and the southwest ¼ of section 20 of Township 6 North and Range 1 East. The site occupies approximately 17 acres of bottomlands northwest of the center of Arcata. The majority of the site is more or less flat, sloping gradually toward Janes creek, a small third order stream on the southeast side of parcel 505-161-011. Residential housing is located on the north and east side of parcel 505-161-011 and agricultural fields, including parcel 505-151-001, lie to the west. A few scattered residences and Foster Avenue occur to the south of the study area.

Parcel 505-161-011 was historically used as the location of a lumber mill (Van De Nor Mill) and although the site has been vacant since 1986, the past use has influenced the sites present environmental setting and plant communities. Fill (compacted river run gravel, gravelly

silt, and wood debris) covers the parcel to varying depths and with differing degrees of compaction. Because the terrain is relatively uneven and concavely undulating (due to past use and degree of compaction) decreased infiltration and drainage in low spots may have resulted in "isolated wet pockets". Parcel 505-161-011 is characterized by non-native upland plants characteristic of degraded upland habitat. Sweet vernal grass (*Anthoxanthum odoratum*), Himalayan blackberry (*Rubus armeniacus*), California blackberry (*Rubus ursinus*), Italian Ryegrass (*Festuca perennis*), Poison Hemlock (*Conium maculatum*), Wild Teasel (*Dipsacus fullonum*), Small fescue (*Festuca microstachys*), and wild Oat (*Avena fatua*) were the most commonly observed plant species within the parcel. Depressions were characterized by Himalayan blackberry (*Rubus armeniacus*), California blackberry (*Rubus ursinus*), Teasel (*Dipsacus fullonum*), Spring Vetch (*Vicia sativa*), Canary Reedgrass (*Phalaris arundinacea*), Pennyroyal (*Mentha pulegium*), and Common Rush (*Juncus effuses*).

The small area of parcel 505-151-001 that was assessed in this study (0.14 acres in the northeastern corner of the parcel), has been historically used for agriculture as it is to this day. The area was heavily grazed and contained many domestic animals during the time of the survey. The site was dusty with many bare areas of soil. Vegetation found here primarily consisted of invasive species such as Sweet vernal grass (*Anthoxanthum odoratum*) and Orchard grass (*Dactylis glomerata*).

Methods:

Definitions:

There is not a single state or federal definition of "wetland." The regulatory jurisdiction over wetlands on the project site may fall under a number of different agencies. Wetland habitats in this analysis take into consideration the definitions and classification schemes of the following, each of which may be relevant to wetlands located on the project site:

The COE (Federal Register 1982) and the EPA (Federal Register 1980) jointly define wetlands as:

> *Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.*

The U.S. Fish and Wildlife Service (Cowardin 1979) defines wetlands as follows:

> WETLANDS *are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For the purposes of this classification wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes; (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year.*

The State Water Resources Control Board (SWRCB), the agency that regulates the discharge of waste to land and ground water that could affect the quality of the "waters of the state" (under the California Porter-Cologne Water Quality Control Act and Section 401 of the federal Clean Water Act), also recognizes one- and two-parameter wetlands, as do the agencies

listed above (see SWRCB 2003). The same is true of the California Department of Fish and Wildlife (DFW), which provides guidance on identifying and protecting wetland and riparian resources in the North Coast region for compliance with the California Environmental Quality Act (CEQA) (See DFW 1994 & 2014).

The U.S. Army Corps of Engineers (ACOE), the agency that regulates the discharge of dredged and fill material into wetlands (per Section 404 of the Clean Water Act), identifies a "jurisdictional wetland" based on the presence of indicators of three wetland parameters: hydrophytic vegetation (plants adapted to anaerobic conditions resulting from a prolonged inundation with water), hydric soils (reduced soils resulting from a prolonged inundation with water), and wetland hydrology.

The City of Arcata defines wetlands in the General Plan (Chapter 4, Policy RC-3, Wetlands Management) as the following:

> *Wetlands shall include coastal zone lands where one or more of the following three characteristics are present or non-coastal zoned lands where two or more of the following three characteristics are present:*
>
> *a. source of water (surface or subsurface) which is present for sufficient periods to promote hydric soils formation or growth of hydrophytic plant species;*
> *b. hydric soils; or*
> *c. hydrophytic plants.*

Sampling Strategy:

Sampling points were subjectively chosen across the study area based on local topography, plant composition and maps of previously recorded wetland sites (See Att. 3 – Location of Sampling Points). A total of nineteen (19) soil pits were dug and at each sampling point vegetation, hydrology, and soils were examined. Eighteen of the pits were done on parcel 505-161-011 and one pit (Pit #8) was done on the adjacent agricultural parcel to the west (APN 505-151-001). Many of the pits occurred in areas previously designated as wetland sites in the 2004 NRM wetland report.

At each sample location vegetation was surveyed and analyzed using the rapid or dominance test with the 2014 regional wetland plant list (Lichvar 2014) used to determine the wetland indicator status of each species. Soil hydrology and hydric soil indicators were then assessed. A 24 inch-deep hole was dug at each sampling point, where possible, and soils were examined for matrix (base) color and redox (reduction/oxidation reaction) color using the Munsell soil color charts (Munsell Color 2000). In addition, 2,2' dipyridil was used to test for iron reduction, a sign of hydric soils. Texture, redox characteristics, horizon depth, saturation depth and water table depth were all examined. Field observations were recorded on the regional supplement to the Corps of Engineers Wetlands Delineation Manual: Western Mountain Valleys, and Coast region data sheets (See Att. 1 – Field Data Sheets).

In addition to the sampling points, the entire site was traversed with vegetation and hydrology being documented as were any obvious depressions within the study area. The method of walking the entire study area between sampling points ensured that no potential wetland areas were overlooked. Sites exhibiting similar vegetation and hydrology to the sites delineated with soil pits by SPC, were assumed to have similar soil characteristics. The riparian areas

surrounding Janes Creek were traversed and hydrology and vegetation were noted, however no sample pits were dug within the riparian zone.

Limitations:

While every attempt was made to identify vegetation down to species during the site visits in July, August, October, and February there were still some species that were dormant, or simply vegetative making it difficult to identify definitively. Due to the low quality of habitat on site, and the overwhelming dominance by non-native species it is unlikely that any species were missed, or miss-identified.

Additional challenges were encountered due to the past use of the site. Super compacted gravel was nearly impossible to dig through and some of the sampling points; leaving some pits less than 24 inches in depth. Soil horizons and classification was hard to discern in some of the more disturbed locations; high water table and saturation led to some of the pits becoming filled with water before we were able to measure soil horizons.

Results:

Four different wetland types were observed and delineated on the project site. These consisted of the following: 1) 1-parameter depressions; 2) 2-parameter isolated wet patches; 3) 3-parameter isolated wet pockets; and 4) 3-parameter man-made ditches on either side of the railroad right of way. Table 1 below lists the coverage area of the various wetland types and Attachment 4 (Wetland Map) shows the location and lists the coverage area of each wetland area.

Table 1: Wetland Coverage Area by Type	
Wetland Type	**Coverage Area**
1 Parameter (man-induced, seasonal)	21,283 ft^2
2 Parameter (man-induced, seasonal)	4,000 ft^2
3 Parameter (man-induced, seasonal)	12,707 ft^2
Ditches (3 Parameter) (man-induced)	13,284 ft^2
Total Wetland Cover (all types combined)	**51,274 ft^2**

Description of Wetland types:

One Parameter (man-induced, seasonal, isolated)

One parameter wetlands delineated on site varied in size and quality of the habitat present. Habitat quality within the one parameter wetland areas was generally fairly poor, with no standing water, non-native species dominance, and no connectivity to other wet habitats. Approximately 21,283 ft^2 of one parameter wetlands were delineated on-site (See Att. 4 – Wetland Map). In all cases, areas meeting one wetland parameter did not have hydric soils present. One parameter wetland sites were primarily dominated by the non-native hydrophytic Pennyroyal (*Mentha Pulegium*), Italian Wild rye (*Festuca perennis*), and Poison Hemlock (*Conium maculatum*), native hydrophytic Arroyo Willow (*Salix lasiolepis*) and the non-native facultative upland (FACU) species Hairy Cats-Ear (*Hypochaeris radicata*). Other species present included non-native English plantain (*Plantago lanceolata*), Velvet grass (*Holcus lanatus*) and Canary Reed Grass (*Phalaris arundinacea*).

One of the sites (Wetland Area 1-4 on Att. 4 - Wetland Map) was within a slight depression with a high water table and saturation present; it appeared that water did not sit in this site long due to the close proximity to the agricultural field and the lack of a compacted layer immediately below the soil surface. The other areas (Wetland Areas 1-0 and 1-2 on Att. 4 – Wetland Map) were all dominated by hydrophytic vegetation but did not meet the hydric soils or wetland hydrology parameters. Wetland Area 1-0 represented an area between two compacted upland sites, and although the area was within a depression the wetland hydrology parameter was not met, possibly because water is able to drain into the nearby adjacent agricultural field without sitting for long periods of time. Wetland Area 1-2 represented an area on top of a super compacted former mill driveway. Little to no soil had developed on top of the driveway surface, precluding the existence of hydric soils. In addition, although the area was slightly depressed, there were no other wetland hydrology indicators. Vegetation coverage was minimal (less than 15% total) due to the lack of soil able to support vegetation on the site.

Lastly, two sites (Wetland Areas 1-1 and 1-5 on Att. 4 – Wetland Map) alongside the western edge of the Janes Creek riparian zone (approximately 17,821 ft^2) met the hydrophytic vegetation parameter due to the dominance of the area by the hydrophytic native Arroyo willow (*Salix lasiolepis*) and non-native Poison Hemlock (*Conium maculatum*). The area was very well drained preventing the development of hydric soils, and contained no wetland hydrology indicators. Furthermore, the site is overwhelmingly dominated by non-native Poison hemlock and Himalaya blackberry and does not represent quality habitat.

Two Parameter (man induced, seasonal, isolated)

The two-parameter wetlands found on site varied in size and quality of habitat present. Approximately 4,000 ft^2 of two parameter isolated wet areas were delineated on-site. These sites existed within topographic low spots that were created as a result of uneven compaction of fill. The two parameter delineated wet-pockets were characterized by hydric soils and wetland hydrology, but did not support hydrophytic dominant plant communities. All had positive dipyridil tests indicating the presence of reduced iron, a hydric soil indicator. In addition they all existed within a depressed region in which storm water could pool. Most of these sites were underlain by compacted gravel left over from the past industrial use of the site, which limited the percolation of water into the soil. Three of the sites (Wetland areas 2-1, 2-2, and 2-3 on Att. 4 – Wetland Map) had dried algal mats and a high water table to confirm prolonged saturation by water. One of the sites (Wetland area 2-0 on Att. 4 – Wetland Map) showed water stained leaves and drainage patterns. Vegetation within these two parameter wet areas consisted primarily of non-native species such as Himalayan blackberry (*Rubus armeniacus*) and California blackberry (*Rubus ursinus*) with one site (Wetland Area 2-3 on Att. 4 – Wetland Map) exhibiting an estimated 70% cover of California Blackberry. Both blackberry species have been determined to be Facultative Upland (FACU) indicator species, making these sites dominated by upland species. Other species present included Pennyroyal, Creeping buttercup (*Ranunculus repens*), Teasel (*Dipsacus fullonum*), and Curly dock (*Rumex crispus*). Many of these species are Facultative (FAC), or Obligate (OBL) wetland species; however they did not display dominance, precluding these sites from displaying dominance by hydrophytic species.

Three Parameter (man-induced, seasonal, isolated)

Isolated three parameter wet pockets were delineated throughout the mid to lower portion of parcel 505-161-011. Three parameter isolated wetlands found on site varied in size and quality

of habitat present. Approximately 12,707 ft^2 of three parameter isolated wet areas were delineated on-site (See Wetland Areas 3-0, 3-1, 3-2, and 3-8 on Att. 4 – Wetland Map). These are the result of past heavy equipment use on site and the uneven compaction of fill; therefore these are considered a-typical man-induced wet-areas. These areas displayed hydric soils, wetland hydrology, and the presence of strongly hydrophytic vegetation. The isolated three parameter wetlands were found to occur primarily on top of a super compacted gravel layer, or in depressions between two compacted areas. Both types displayed different vegetation dominance and soil characteristics. Wetlands on top of a super compacted gravel layer (represented by Wetland Areas 3-0 and 3-1 on Att. 4 – Wetland Map) were dominated by the non-native Pennyroyal, Teasel, Hairy Cats-ear (*Hypochaeris radicata*), and Sweet vernal grass (*Anthoxanthum odoratum*) and the native Common Rush (*Juncus effuses*) and Meadow Barley (*Hordeum brachyantherum*). Lesser dominant species included Three cornered sedge (*Cyperus eragrostis*) (native), California blackberry (native), Kentucky Blue Grass (*Poa pratensis*) (non-native), and the Birds-foot Trefoil (*Lotus corniculatus*) (non-native). Soil samples typically displayed a thin top soil layer with a chroma value of 10YR 2/1, gradating from a peat at the surface into a loam and quickly into gravel and cobble. The dipyridil test revealed reduced iron, an indicator of hydric soils within each pit. Below this thin soil layer (less than 9 inches at each soil pit) existed a super compacted gravel layer composed of gravelly sand and river run. All of these sites displayed primary and secondary wetland hydrology indicators including a shallow concave depression in which water collects, saturation, sparsely vegetated concave surface and an algal mat.

Isolated three parameter wetlands found in depressions between two compacted areas (represented by Wetland Areas 3-2 and 3-8 on Att. 4 – Wetland Map) were dominated by the wetland indicator species Italian Wild-rye (non-native), Curly Dock (non-native), Kentucky Bluegrass (non-native), Birds-foot Trefoil (*non-native*), and the Nootka Rose (*Rosa nutkana*) (native). Lesser dominant species included Orchard Grass (*Dactylis glomerata*) (non-native), and Velvet Grass (*Holcus lanatus*) (non-native). Soils samples typically displayed a much deeper top soil that graded into non-native fill soils and were not underlain by a compacted gravel layer. Top-soils displayed a chroma value of 10 YR 2/1, and extended to depths of more than 14 inches. The dipyridil test revealed reduced iron, an indicator of hydric soils within each sample pit. All of the isolated three parameter sites not underlain by the super compacted gravel layer displayed primary and secondary wetland hydrology indicators, including a concave depression that impounded water, an abundance of green algae, a high water table and the presence of surface water in Wetland Area 3-8 (See Att. 4 – Wetland Map), one week since the previous rainstorm.

Based on the presence of highly manipulated soils and the past use of the site as a lumber mill, these wetland sites are considered man-induced, a result of uneven compaction of fill and inadequate drainage of the site. Furthermore the wetland sites are not connected to other wetland areas, buffers, or natural communities resulting in isolated wet areas. The visit to the site in July 2015 revealed the seasonal nature of the wetlands as they were all dry and the water table had dropped below the 24 inch depth of the soil pits. However, Wetland Areas 3-0, 3-1, 3-2, and 3-8 (See Att. 4 – Wetland Map) displayed dominance by hydrophytic vegetation, the presence of hydric soils, and wetland hydrology. Therefore these areas are considered 3-parameter, isolated, man-induced seasonal wetlands.

Ditches (man-induced, seasonal)

Two pronounced man-made ditches (approximately 3-5 ft deep) run the length of the southern border of parcel 505-161-011 covering a total of 13,284 ft^2 (See Wetland Areas 3-3 – 3-7 on Att. 4 – Wetland Map). The first ditch (represented by Wetland Area 3-4 on Att. 4 – Wetland Map) runs between Foster Avenue and the railroad tracks and presumably drains both Foster Ave. and the railroad right-of-way. This ditch continues west past the study parcel. The second ditch (represented by Wetland Area 3-7 on Att. 4 – Wetland Map) lies north of the railroad tracks along the southern border of parcel 505-161-011 and presumably drains the southern portion of parcel 505-161-011 based on the general slope of the site toward the south. The second ditch does not extend west beyond the western border of the annexation parcel. Both ditches were found to meet three wetland parameters from the bottom of the ditch to the top of bank. Both ditches displayed a dominance of hydrophytic vegetation throughout their entire lengths, except in the culverted sections where old mill access driveways crossed the ditches. Dominant species within the ditches included the wetland indicator species Arroyo Willow (native), Lady Fern (*Athyrium filix-femina*) (native), and Giant Horsetail (*Equisetum telmateia*) (native). Lesser dominants included the non-native Himalaya blackberry and the native California blackberry, Common Rush, Three cornered sedge, and Sword Fern (*Polystichum munitum*). Hydric soils were present as evidenced by a redox dark surface within both ditches, extending up the side of the ditches to the top of the bank. Wetland hydrology was observed, with the primary indicator being a ditch that collects and runs water during storm events. Additionally, drainage patterns were observed, and the depth and position of the ditches ensures that they collect runoff from parcel 505-161-011, the railroad right-of-way, and Foster Avenue. It is unclear as to whether or not the ditches ultimately run to Janes Creek. The slope was not obvious and drainage patterns seemed to indicate that water sat in the ditches for prolonged periods of time, rather than flowing through and draining out.

Areas Not Delineated as Wetlands:

Several sample areas and soil pits were in areas not delineated as wetlands. These included upland regions and dry *Rubus* patches that did not meet any wetland parameters. In addition the Janes Creek riparian corridor was not thoroughly analyzed as part of this study.

Upland Regions

Several upland areas sampled met no wetland parameters. The north eastern portion of parcel 505-161-011 is comprised primarily of upland habitat. Sampling point #11 was taken within a slight depression that had two Arroyo willows growing out of it. Within the whole north-eastern portion of the parcel this seemed like the most probable location of a potential wetland. Upon closer inspection, hydric soils were not found and other than the geomorphic depression, wetland hydrology was not present. Lastly, even with the presence of a FAC willow species the sample area was not dominated by hydrophytic vegetation.

Sampling point #8 was taken on the northeastern corner of the adjacent agricultural parcel (APN 505-151-001). This area was not found to meet any wetland parameters with a dominance by non-native pasture grass species, lack of hydric soils and no wetland hydrology indicators. This parcel was also characterized by heavy grazing and bare soils.

Two regions dominated by *Rubus* species were also found to meet no wetland parameters. These areas (Sampling points #1 and #2) existed between two highly compacted regions in the western portion of parcel 505-161-011. They were dominated overwhelmingly by *Rubus* species, precluding the sites from being dominated by hydrophytic vegetation. Hydric soils and wetland hydrology were not present, possibly reflecting the ease with which water drains from the site onto the immediately adjacent agricultural parcel (APN 505-151-001). Even though sampling point 2 did exist within a depression, there was little evidence that water stands in this area for any length of time.

Janes Creek Riparian Corridor

The Janes Creek riparian corridor alongside the southeastern border of parcel was not thoroughly analyzed as part of this wetland delineation because it is entirely within the City of Arcata's Streamside Protection Zone, although, the Janes Creek riparian corridor was traversed and vegetation was recorded as well as hydrology. Much of the riparian tree cover was restored in 1995 and has grown in since that time. However, the understory is dominated by non-native species such as English Ivy (*Hedera helix*) and Canary Reed Grass (*Phalaris arundinaceae*). Based on field observations of hydrophytic vegetation, drift lines, and the presence of standing/flowing water, a large portion of the riparian area would likely be delineated at the very least as a two-parameter wetland.

Table 2. Summary of Parameters Met at Each Sample Point				
Sample Point	**Hydrophytic Vegetation**	**Hydric Soil**	**Wetland Hydrology**	**Parameters Met**
#1	No	No	No	0
#2	No	No	No	0
#3	Yes	No	No	1
#4	Yes	Yes	Yes	3
#5	Yes	Yes	Yes	3
#6	Yes	Yes	Yes	3
#7	Yes	Yes	Yes	3
#8	No	No	No	0
#9	No	Yes	Yes	2
#10	Yes	Yes	Yes	3
#11	No	No	No	0
#12	Yes	Yes	Yes	3
#13	Yes	Yes	Yes	3
#14	Yes	No	No	1
#15	Yes	No	No	1
#16	Yes	Yes	Yes	3
#17	No	Yes	Yes	2
#18	No	Yes	Yes	2
#19	No	No	Yes	1

Conclusion:

One-, two-, and three-parameter wetlands were sampled and delineated on parcel 505-161-011 that will be directly impacted by future development of the property. All of the wetlands delineated on parcel 505-161-011 have some wetland value and functionality. Even a heavily impacted man-induced wetland area can have habitat value as being a breeding location for amphibians, habitat for aquatic invertebrates and hydrophytic vegetation. In addition, these wet areas do serve to retain storm water, aid in groundwater recharge, filter potential introduced pollutants, as well as many other wetland functions. That being said, the wetlands found on site varied in the quality of habitat and wetland function, and many of the areas delineated as wetlands are of very low habitat quality and wetland functionality. Wetland quality on site was influenced by a number of different factors, mainly connectivity to other wetland or natural areas, dominance by native or non-native vegetation, structure and diversity of the wetland for wildlife habitat, presence of a buffer, and the size of the wetland.

Wetland areas found to be the highest quality were the three parameter ditches alongside the railroad right-of-way (Wetland Areas 3-3 – 3-7 on Att. 4 – Wetland Map). These wet areas had the highest dominance by native wetland vegetation, had a buffer of *Rubus* species, presence of standing water, and represented a habitat connection between the Janes creek riparian corridor and wet areas to the west. Additionally, the ditches displayed the strongest hydric soil indicators and evidence of wetland hydrology.

Other higher quality three parameter wetland areas, such as Wetland Area 3-8 (See Att. 4 – Wetland Map), were found to be of lesser habitat and wetland value than the ditches, but slightly better than the surrounding isolated wet spots. Wetland Area 3-8 was found to have a higher percentage of native vegetation and a somewhat well developed buffer composed of *Rubus* species and the Nootka Rose. In addition, this site displayed more well developed hydric soils, and had standing water on site at the time of the site visit in February 2016. Habitat value and wetland function at this site was still limited by the small size of the wetland, minimal wetland structure, and the isolated nature of the site. Additionally, this site was plagued by trash from a large homeless encampment that detracted from the habitat and aesthetic value of this location.

Other two- and three-parameter isolated wetland sites on parcel 505-161-011 were of considerably lower habitat value than the wetland areas described above; however the quality of these sites varied considerably. The best sites were dominated by a greater percentage of native vegetation, and had standing water for greater periods of time, creating wetland habitat for longer periods. However, even sites displaying these characteristics showed no connectivity to other wetland or natural areas, had little wetland structure, no buffer area, and were small in size. The lower quality two- and three-parameter isolated wetlands were dominated by non-native vegetation (such as Pennyroyal) and occurred atop an impervious fill layer left over from the past industrial use of the parcel.

The lowest quality wetland areas found on site were the one-parameter depressions. In addition to the limitations mentioned above for the two- and three-parameter wetlands, these sites did not retain standing water long enough to develop hydric soils, and displayed very little wetland hydrology. In addition, these sites were dominated primarily by non-native species and did not represent quality wetland habitat.

Attachments:

Attachment 1: Field Data Sheets
Attachment 2: Plant Species Observed in the Study Area
Attachment 3: Locations of Sampling Points
Attachment 4: Wetland Map

References:

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Natural Resource Management Corporation (NRM). 2004. *Wetland Delineation Report for Foster Avenue Parcel Nos. 505-161-011 and 505-151-001. Humboldt County, California*. June 21 2004.

Attachment 1:

Field Data Sheets

APPENDIX AA

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Avenue annexation City/County: Arcata, Humboldt Sampling Date: 7/15/2015

Applicant/Owner: Danco State: CA Sampling Point: 1

Investigator(s): Joseph Sater, Sam Polly Section, Township, Range:

Landform (hillslope, terrace, etc.): Flat bottom land Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: Statewide drought

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: ____)			
1. Rubus ursinus	40%	✓	FACU
2. Dipsacus fullonum	10%		FAC
3. Conium maculatum	15%		FAC
4. Raphanus sativus	15%		UPL
5. Vicia sativa	40%	✓	UPL
6. Rumex crispus	5%		FAC
7. Equisetum telmateia	20%		FACW
8. Phalaris arundinacea	2%		FACW
9. Anthoxanthum odoratum	1%	✓	FACU
10. Convolvulus arvensis	5%		UPL
11.			
	153 = Total Cover 75 / 30.6		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	22	x 2 =	44
FAC species	30	x 3 =	90
FACU species	41	x 4 =	164
UPL species	60	x 5 =	300
Column Totals:	153 (A)		598 (B)

Prevalence Index = B/A = 3.9

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- N 2 - Dominance Test is >50%
- N 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ 5 - Wetland Non-Vascular Plants[1]
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

APPENDIX AA

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist) (dry)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
1-16	10YR 4/2	100	NA	NA	NA	NA	Loam	Gravelly & Cobbly
16-24	10YR 4/2	65	2.5YR 3/6	35	C	M	Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

Moist Color = 10YR 2/1

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX AA

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Avenue Annexation City/County: Arcata / Humboldt Sampling Date: 7/15/2015

Applicant/Owner: DANCO State: CA Sampling Point: 2

Investigator(s): Sam Polly, Joseph Sater Section, Township, Range: _____

Landform (hillslope, terrace, etc.): flat bottomland Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: -statewide drought
-Old industrial site

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: ____)			
1. Helminthotheca echioides	25	✓	FAC
2. Rubus ursinus	20	✓	FACU
3. Rubus armeniacus	20	✓	FACU
4. Conium maculatum	15		FAC
5. Phalaris arundinacea	2		FACW
6. Raphanus sativus	5		UPL
7. Rumex crispus	1		FAC
8. Dipsacus fullonum	1		FAC
9.			
10.			
11.			
	89 = Total Cover		44.5 / 17.8
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	2	x 2 =	4
FAC species	42	x 3 =	126
FACU species	40	x 4 =	160
UPL species	5	x 5 =	25
Column Totals:	89 (A)		315 (B)

Prevalence Index = B/A = 3.54

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- No 2 - Dominance Test is >50%
- N 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

APPENDIX AA

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
1-11	10YR2/1	100	NA				Loam	Very gravelly cobbly, many roots
11-24	10YR2/1	100	NA				Loam	"

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks: 10YR4/2 dry; top horizon had more granular structure w/ many fine roots

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX AA

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Avenue Annexation City/County: Arcata / Humboldt Sampling Date: 7/15/2015

Applicant/Owner: DANCO State: CA Sampling Point: 3

Investigator(s): Joseph Sater, Sam Polly Section, Township, Range: _____

Landform (hillslope, terrace, etc.): Flat, Bottomland Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:
- Statewide drought
- Industrial site

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Plantago lanceolata	5		FACU
2. Mentha pulegium	25%	✓	Obl
3. Briza minor	2		FAC
4. Lolium perenne	20%	✓	FAC
5. Holcus lanatus	5		FAC
6. Hypochaeris radicata	2		FACU
7. Lipum bienne	1		UPL
8. Anthoxanthum odoratum	2		FACU
9. Rumex crispus	2		FAC
10. Bromus hordeaceus	1		FACU
11.			
	65 = Total Cover		32.5/13
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 25	x 1 = 25
FACW species 0	x 2 = 0
FAC species 29	x 3 = 87
FACU species 10	x 4 = 40
UPL species 1	x 5 = 5
Column Totals: 65 (A)	157 (B)

Prevalence Index = B/A = 2.4

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

APPENDIX AA

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-24"	10YR 2/1	100	NA				Loam	Gravelly, cobbly

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX AA

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Avenue Annexation City/County: Arcata / Humboldt Sampling Date: 7/16/15

Applicant/Owner: DANCO State: CA Sampling Point: 4

Investigator(s): Sam Polly / Joseph Sabo Section, Township, Range:

Landform (hillslope, terrace, etc.): flat, bottomland Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks: -State wide drought
-former industrial site

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: ____)			
1. Mentha pulegium	10%		OBL
2. Rumex crispus	1		FAC
3. Briza minor	5		FAC
4. Cyperus eragrostis	10		FACW
5. Juncus effusus	5		FACW
6. Hordeum brachyantherum	30	✓	FACW
7. Bromus racemosus	2		NI
8. Lolium perenne	5		FAC
9. Hypochaeris radicata	1		FACU
10. Plantago lanceolata	1		FACU
11. Epilobium sp.	1		
	70 = Total Cover		35.5 / 14.2
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		
% Bare Ground in Herb Stratum ____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:
OBL species	10	x 1 = 10
FACW species	45	x 2 = 90
FAC species	11	x 3 = 33
FACU species	2	x 4 = 8
UPL species		x 5 =
Column Totals:	71 (A)	141 (B)

Prevalence Index = B/A = 1.98

Hydrophytic Vegetation Indicators:

- Y 1 - Rapid Test for Hydrophytic Vegetation
- Y 2 - Dominance Test is >50%
- Y 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ 5 - Wetland Non-Vascular Plants[1]
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

APPENDIX AA

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 2/1	100	NA				Loam	
7-12+	NA						Gr Sand	Gray river run
~~12+~~								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

- Dipyridil test (done in february)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ✓ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX AA

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Avenue Annexation City/County: Arcata / Humboldt Sampling Date: 7/16/15

Applicant/Owner: DANCO State: CA Sampling Point: 5

Investigator(s): Joseph Sater, Sam Polly Section, Township, Range:

Landform (hillslope, terrace, etc.): Flat, Bottomland Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks: -Statewide drought
-former industrial site.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: ____)			
1. Dipsacus fullonum	20	✓	FAC
2. Juncus effusus	20	✓	FACW
3. Rubus ursinus	10		FACU
4. Anthoxanthum odoratum	35	✓	FACU
5. Symphyotrichum chilense	1		FAC
6. Cirsium vulgare	1		FACU
7. Daucus carota	1		FACU
8.			
9.			
10.			
11.			
	88 = Total Cover		44 / 17.6
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	20	x 2 =	40
FAC species	21	x 3 =	63
FACU species	47	x 4 =	188
UPL species		x 5 =	
Column Totals:	88 (A)		291 (B)

Prevalence Index = B/A = 3.31

Hydrophytic Vegetation Indicators:

__ 1 - Rapid Test for Hydrophytic Vegetation

Y 2 - Dominance Test is >50%

N 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ 5 - Wetland Non-Vascular Plants[1]

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

APPENDIX AA

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
1-9	10YR 2/1	100	NA				Loam	gravelly cobbly river run, gray
9+	NA							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

- Dipyridil test (done in February)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ✓ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ✓ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX AA

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster City/County: Arcata/Humboldt Sampling Date: 8-24-15

Applicant/Owner: DANCO State: CA Sampling Point: 6

Investigator(s): Joseph Sulek, Sam Polly Section, Township, Range:

Landform (hillslope, terrace, etc.): bottomland Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): A, MLRA 4B Lat: 40.87988 Long: -124.09593 Datum:

Soil Map Unit Name: NWI classification: PEM 1D

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks: Drought year

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: ____)			
1. Juncus effusus	13		FACW
2. Cyperus eragrostis	13		FACW
3. Equisetum telmatia	2		FACW
4. Stachys ajugoides	2		Obl
5. Rubus ursinus	10		FACU
6. Rubus armeniacus	10		FACU
7. Epilobium sp.	1		N/A
8. Phalaris arundinacea (many	1		FACW
9. Salix lasiolepis	30	✓	FACW
10. Holcus lanatus	2		FAC
11. Rumex crispus	1		FAC
	85 = Total Cover		42.5/17
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 1	x 1 = 1
FACW species 5	x 2 = 10
FAC species 2	x 3 = 6
FACU species 2	x 4 = 8
UPL species ____	x 5 = ____
Column Totals: 10 (A)	25 (B)

Prevalence Index = B/A = 2.5

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- X 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ 5 - Wetland Non-Vascular Plants[1]
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

APPENDIX AA

SOIL West RR Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/1	100%					Loam	Granular Structure
3-24	10YR 3/1	72	10YR 4/4	18	Concen	M/PL	loam	
			10YR 4/6	8	Concen.	M/PL	Loam	
			2.5YR 3/6	2	Concen.	M/PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ✓ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Other = Drainage Ditch runs H_2O during winter

APPENDIX AA

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Ave. City/County: Humboldt Sampling Date: 8-24-15

Applicant/Owner: DANCO State: CA Sampling Point: 7

Investigator(s): Joseph Saler, Sam Polly Section, Township, Range: _____

Landform (hillslope, terrace, etc.): ditch, north of road Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR): _____ Lat: 40.37963 Long: -124.09479 Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks: -statewide Drought

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Polystichum munitum	9		FACU
2. Equisetum telmateia	21	✓	FACW
3. Athyrium filix-femina (lady fern)	42	✓	FAC
4. Rubus ursinus	4		FACU
5. Rubus armeniacus	10		FACU
6. Epilobium sp.	2		N/A
7. Rumex crispus	1		FAC
8. Vicia hirsuta (Tiny Vetch)			NL
9. Anthoxanthum odoratum	2		FACU
10. Juncus effusus	2		FACW
11. Juncus patens	2		FACW
	95 = Total Cover		47.5/19
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

APPENDIX AA

SOIL G.RR

Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/1	100					Loam	Granular, dense roots
3-24	10YR 3/1	63	10YR 4/4	30	C	M/PL	Loam	
			10YR 4/6	3	C	M/PL		
			10YR 3/6	2	C	M/PL		
	2.5Y 3/1	2	~~2.5Y 3/1~~	~~2~~				Krotovina

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ✓ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ✓ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Other = "roadside" ditch that runs to culvert

APPENDIX AA

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Ave City/County: Humboldt Sampling Date: 10/9/15
Applicant/Owner: DANCO State: CA Sampling Point: 8
Investigator(s): Sam Polly / Joseph Sater Section, Township, Range:
Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 2
Subregion (LRR): Lat: Long: Datum:
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No X (If no, explain in Remarks.)
Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes ___ No X
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ___ No X
Hydric Soil Present? Yes ___ No X
Wetland Hydrology Present? Yes ___ No X
Is the Sampled Area within a Wetland? Yes ___ No X

Remarks: Area is heavily grazed, bare dirt extensive. Severe drought statewide

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1. Malus sp. Apple	3		NL
2. Prunus sp. Cherry	4		NL
3. Prunus sp. Plum	2		NL
4.			
	9	= Total Cover	
Sapling/Shrub Stratum (Plot size: ___)			
1. None			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: ___)			
1. Anthoxanthum odoratum	20	✓	FACU
2. Dactylis glomerata	5		FACU
3. Trifolium hybridum Alsike clover	2		FAC
4. Conium maculatum Poison hemlock	1		FAC
5. Rumex crispus (Curly dock)	1		FAC
6. Hypochaeris radicata	2		FACU
7. Poa pratensis	5		FAC
8.			
9.			
10.			
11.			
	36	= Total Cover	5.5 / 6.2
Woody Vine Stratum (Plot size: ___)			
1. Hedera helix	2		FACU
2. Rubus armeniacus	2		FACU
	4	= Total Cover	22 / 8.8
% Bare Ground in Herb Stratum	49		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ___	x 1 = ___
FACW species ___	x 2 = ___
FAC species ___	x 3 = ___
FACU species ___	x 4 = ___
UPL species ___	x 5 = ___
Column Totals: ___ (A)	___ (B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks:

APPENDIX AA

SOIL

Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-24	10YR 2/2	100					Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX AA

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Ave City/County: Humboldt Sampling Date: 2/15/16

Applicant/Owner: DANCO State: CA Sampling Point: 9

Investigator(s): Sam Polly, Joseph Salter Section, Township, Range:

Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks: 2 parameters met.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. Rubus armeniacus	40%	✓	FACU
2.			
3.			
4.			
5.			
	40% = Total Cover		
Herb Stratum (Plot size: ____)			
1. Dactylis glomerata	15%	✓	FACU
2. Hypochaeris radicata	1%		FACU
3. Ranunculus repes	5%		FAC
4. Equisetum arvense	5%		FACW
5. Epilobium ciliatum	5%		FACW
6. Conium maculatum	2%		FAC
7. Helminthotheca echioides	1%		FAC
8. Juncus patens	1%		FACW
9. Cirsium vulgare	1%		FACU
10.			
11.			
	35% = Total Cover		17.5 / 7
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 3	x 2 = 6
FAC species 3	x 3 = 9
FACU species 4	x 4 = 16
UPL species ____	x 5 = ____
Column Totals: 10 (A)	31 (B)

Prevalence Index = B/A = 3.1

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

APPENDIX AA

SOIL

Sampling Point: 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-17	10YR 3/1	100			NA	NA	CL	
17-24+	10YR 3/2	96	N3/	4	D	M	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

Other: Dipyridil test

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- X Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- X Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX AA

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Avenue City/County: Humboldt Sampling Date: 2/15/16

Applicant/Owner: DANCO State: CA Sampling Point: 10

Investigator(s): Sam Dolly, Joseph Sater Section, Township, Range: _____

Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation X, Soil X, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:
3 parameters met

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Rubus armeniacus	5%	✓	FACU
2.			
3.			
4.			
5.			
	5 = Total Cover		
Herb Stratum (Plot size: _____)			
1. Rumex crispus	5	✓	FAC
2. Rosa nutkana	5	✓	FAC
3. Poa pratensis	1		FAC
4. Rumex acetosella	1		FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	12 = Total Cover		6/2.4
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 80%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 2/3 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	3	x 3 =	9
FACU species	2	x 4 =	8
UPL species		x 5 =	
Column Totals:	5 (A)		17 (B)

Prevalence Index = B/A = 3.4

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

APPENDIX AA

SOIL

Sampling Point: 10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
12+	10YR2/1	100			NA	NA	mucky L	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Dipyridil test

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- X Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- X Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- X Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- X Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- X Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes X No _____ Depth (inches): _____

Water Table Present? Yes X No _____ Depth (inches): 4 inches

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX AA

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Avenue City/County: Humboldt Sampling Date: 2/15/16
Applicant/Owner: DANCO State: CA Sampling Point: 11
Investigator(s): Sam Polly, Joseph Sater Section, Township, Range:
Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): Slope (%): 1
Subregion (LRR): Lat: Long: Datum:
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ____ (If no, explain in Remarks.)
Are Vegetation X, Soil X, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Disturbed former industrial site

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1. Salix lasiolepis	50%	✓	FACW
2.			
3.			
4.			
	50 = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. Crataegus laevigata	1		FAC
2. Rubus ursinus	2		FACU
3. Rubus armeniacus	30	✓	FACU
4.			
5.			
	33 = Total Cover		16.5
Herb Stratum (Plot size: ____)			5.5
1. Juncus patens	5	✓	FACW
2. Juncus effusus	5	✓	FACW
3. Vicia sativa	2		UPL
4. Anthoxanthum odoratum	2		FACU
5. Dactylis glomerata	2		FACU
6. Holcus lanatus	2		FAC
7.			
8.			
9.			
10.			
11.			
	18 = Total Cover		9/3.6
Woody Vine Stratum (Plot size: ____)			
1. Hedera helix	20	✓	FACU
2.			
	20 = Total Cover		

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	3	x 2 =	6
FAC species	2	x 3 =	6
FACU species	5	x 4 =	20
UPL species	1	x 5 =	5
Column Totals:	11 (A)		37 (B)

Prevalence Index = B/A = 3.36

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

APPENDIX AA

SOIL

Sampling Point: 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
14+	10YR 2/1	100			NA	NA	Gr L	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX AA

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Avenue City/County: Humboldt Sampling Date: 2/15/16

Applicant/Owner: DANCO State: CA Sampling Point: 12

Investigator(s): Sam Polly, Joseph Sater Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X	No _____	
Wetland Hydrology Present?	Yes X	No _____	

Remarks: - Former industrial site

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Rumex crispus	2		FAC
2. Dactylis glomerata	5		FACU
3. Holcus lanatus	5		FAC
4. Festuca perennis	20	✓	FAC
5. Mentha pulegium	1		OBL
6.			
7.			
8.			
9.			
10.			
11.			
	33 = Total Cover		16.5 / 6
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

APPENDIX AA

SOIL

Sampling Point: 12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
14+	10YR 2/1	100			NA	NA	Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Dipyridil test

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- X Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes X No _____ Depth (inches): _____

Water Table Present? Yes X No _____ Depth (inches): 1 inch

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX AA

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Ave. City/County: Humboldt Sampling Date: 2/15/16

Applicant/Owner: DANCO State: CA Sampling Point: 13

Investigator(s): Sampay, Joseph Sader Section, Township, Range:

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
- Former Industrial site
3 parameters met.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: ____)			
1. Hypochoeris radicata	15	✓	FACU
2. Mentha pelegium	20	✓	Obl
3. Rumex crispus	1		FAC
4. Juncus bufonius	5		FACW
5. Festuca arundinaceae	1		FAC
6. Holcus lanatus	5		FAC
7. Lotus corniculatus	10		FAC
8. Poa pratensis Kentucky	10		FAC
9.			
10.			
11.			
	67 = Total Cover		33.5 / 13.4
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	1	x 1 =	1
FACW species	1	x 2 =	2
FAC species	5	x 3 =	15
FACU species	1	x 4 =	4
UPL species		x 5 =	
Column Totals:	8 (A)		22 (B)

Prevalence Index = B/A = 2.75

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

__ 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0[1]

__ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ 5 - Wetland Non-Vascular Plants[1]

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

APPENDIX AA

SOIL

Sampling Point: 13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2/1				NA	NA	Peat	Peat
3-12	N5/				NA	NA	Vgr CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- X Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Dipyridil test

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- X Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes X No 0 Depth (inches): 1 in

Water Table Present? Yes X No ___ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX AA

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Avenue City/County: Humboldt Sampling Date: 2/15/16

Applicant/Owner: DANCO State: CA Sampling Point: 14

Investigator(s): Sam Polly, Joseph Jaler Section, Township, Range:

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 1

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:
Former Industrial site.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: ____)			
1. Lolium perenne	7	✓	FAC
2. Mentha pulegium	5	✓	OBL
3. Plantago lanceolata	2		FACU
4. Hypochaeris radicata	1		FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	15 = Total Cover		7.5
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 80

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:
Gravel, super compacted

APPENDIX AA

SOIL

Sampling Point: 14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 2/1				NA	NA	mucky Peat Loam	
5-9+	N4/				NA	NA	Vgrl	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Super compacted, old mill driveway

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX AA

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: foster Avenue City/County: Humboldt Sampling Date: 2/15/16

Applicant/Owner: DANCO State: CA Sampling Point: 15

Investigator(s): Sam Polly, Joseph Sailer Section, Township, Range: _____

Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): None Slope (%): 1

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiolepis	10	✓	FACW
2.			
3.			
4.			
	10 = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Phalaris arundinacea	10		FACW
2. Conium maculatum	40	✓	FAC
3. Plantago lanceolata	1		FACU
4. Holcus lanatus	5		FAC
5. Cirsium vulgare	1		FACU
6.			
7.			
8.			
9.			
10.			
11.			
	57 = Total Cover		27.4
Woody Vine Stratum (Plot size: _____)			
1. Hedera helix	5	✓	FACU
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 2/3 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- X 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

APPENDIX AA

SOIL

Sampling Point: 15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/1	100			NA	NA	GrL	
6-14+	10YR 3/2				NA	NA	GrL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX AA

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Avenue City/County: Humboldt Sampling Date: 2/15/16

Applicant/Owner: DANCO State: CA Sampling Point: 16

Investigator(s): Sam Polly, Joseph Sailer Section, Township, Range: _____

Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:
- Former Industrial site.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Lotus corniculatus	20	✓	FAC
2. Poa pratensis	10	✓	FAC
3. Rumex crispus	5		FAC
4. Mentha pelugium	2		Obl
5. Ranunculus repens	2		FAC
6. Symphyotrichum chilense	5		FAC
7.			
8.			
9.			
10.			
11.			
	44 = Total Cover		22
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

APPENDIX AA

SOIL

Sampling Point: 16

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR2/1				NA	NA	Gr CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

Dipyridil test.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 10"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX AA

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Avenue City/County: Humboldt Sampling Date: 2/15/16

Applicant/Owner: DANCO State: CA Sampling Point: 17

Investigator(s): Sam Polly Section, Township, Range:

Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks: former industrial site

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. Rubus armeniacus	5	✓	FACU
2. Rubus ursinus	3	✓	FACU
3.			
4.			
5.			
	8 = Total Cover		4/8
Herb Stratum (Plot size: ____)			
1. Mentha pulegium	20	✓	Obl
2. Ranunculus repens	5		FAC
3. Symphytrichum chilense	5		FAC
4. Dipsacus fullonum teasel	1		FAC
5. Poa pratensis kentucky	2		FAC
6. Rumex crispus	1		FAC
7. Lotus corniculatus birds foot	5		FAC
8.			
9.			
10.			
11.			
	39 = Total Cover		19.5/7.8
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 1/3 = 30% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- ___ 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

APPENDIX AA

SOIL

Sampling Point: 17

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/1	100			NA	NA	CL	
10-24	N3/	90	2.5Y/R 2.5/4	10	C	PL	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- X Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

Dipyridil test.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- X Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**)
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes X No ~~X~~ Depth (inches): 14"

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX AA

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Ave. City/County: Humboldt Sampling Date: 2/15/16

Applicant/Owner: DANCO State: CA Sampling Point: 18

Investigator(s): Sam Polly, Joseph Salter Section, Township, Range:

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation X, Soil X, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
- Former industrial site.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. Rubus ursinus	70	✓	FACU
2.			
3.			
4.			
5.			
	70 = Total Cover		
Herb Stratum (Plot size: ____)			
1. Ranunculus repens	1		FAC
2. Holcus lanatus	3	✓	FAC
3. Rumex crispus	3	✓	FAC
4. Symphyotrichum chilense	4	✓	FAC
5. Bipshacus fullonum basal	1		FAC
6.			
7.			
8.			
9.			
10.			
11.			
	12 = Total Cover		5/4
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		
% Bare Ground in Herb Stratum ____			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ 5 - Wetland Non-Vascular Plants[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:
- This site fails the rapid test, however, due to the number of FAC species it passes to Dominance test, even though cover is very minimal.

APPENDIX AA

SOIL

Sampling Point: 18

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/1	100			NA	NA	Gr CL	
10-20	10YR 3/1	100			NA	NA	Gr CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Dipyridil test

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- X Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes X No ___ Depth (inches): 10

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 10

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX AA

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Ave City/County: Humboldt Sampling Date: 2/15/16
Applicant/Owner: DANCO State: CA Sampling Point: 19
Investigator(s): Sam Kelly, Joseph Sater Section, Township, Range:
Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): concave Slope (%): 1
Subregion (LRR): Lat: Long: Datum:
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation X, Soil X, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ___ No X
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** Yes ___ No X
Hydric Soil Present?	Yes ___	No X	
Wetland Hydrology Present?	Yes X	No ___	

Remarks:
- Industrial site, disturbed

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ___)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: ___)			
1. Hydrochaeris radicata	40	✓	FACU
2. Mentha pulegium	40	✓	OBL
3. Holcus lanatus	2		FAC
4. Festuca perenne	2		FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	84 = Total Cover		42 / 16.8
Woody Vine Stratum (Plot size: ___)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum ___

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	1	x 1 =	1
FACW species		x 2 =	
FAC species	2	x 3 =	6
FACU species	1	x 4 =	4
UPL species		x 5 =	
Column Totals:	3 (A)		11 (B)

Prevalence Index = B/A = 3.6

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks:

APPENDIX AA

SOIL

Sampling Point: 19

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1				NA	NA	CL	
2-12	10YR 4/1				NA	NA	CL	
12-24	10YR 3/1	90	2.5YR 2.5/4	10	C	PL	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes X No ___ Depth (inches): 11

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 6

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Attachment 2:

Plant Species Observed On-Site

APPENDIX AA

Attachment 2: Plant Species Observed On-Site

Listing	Scientific Name	Common Name	Native	WtInd Stat.
	TREES			
	Crataegus laevigata	English Hawthorne	N	FAC
	Malus sp.	Cultivated apple	N	NI
	Prunus sp.	Cultivated plum	N	NI
	Prunus sp.	Cultivated cherry	N	NI
	Prunus cerasifera var. pissardii	flowering plum	N	FACU
	Salix lasiolepis	Arroyo Willow	Y	FACW
	SHRUBS/VINES			
	Hedera helix	English Ivy	N	FACU
	Rubus armeniacus	Himalayan blackberry	N	FACU
	Rubus ursinus	Pacific bramble; California blackberry	Y	FACU
	Rosa nutkana	Nootka Rose	Y	FAC
	HERBS			
	Carthamus lanatus	Distaff Thistle	N	UPL
	Cirsium vulgare	Bull Thistle	N	FACU
	Conium maculatum	poison hemlock	N	FAC
	Convolvulus arvensis	field bindweed	N	FACU
	Daucus carota	wild carrot or Queen Anne's lace	N	FACU
	Dipsacus fullonum	Wild Teasal	N	FAC
	Epilobium sp.	Willow Herb	Y	NI
	Euphorbia virgata	Leafy Spurge	N	UPL
	Foeniculum vulgare	Fennel	N	NI
	Geranium dissectum	cut-leaved geranium	N	FACU
	Helminthotheca echioides	Bristly Oxe-tongue	N	FAC
	Hemizonia congesta	Hayfield Tarweed	Y	NI
	Hypochaeris radicata	Hairy Cats-ear	N	FACU
	Juncus effuses	Common Rush	Y	FACW
	Leucanthemum vulgare	Oxeye daisy	N	FACU
	Linum bienne	Narrow Leaved Flax	N	UPL
	Lotus corniculatus	Birds foot trefoil	N	FAC
	Mentha pulegium	Pennyroyal	N	OBL
	Plantago lanceolata	English plantain	N	FACU
	Ranunculus repens	creeping buttercup	N	FAC
	Raphanus sativus	wild radish	N	UPL
	Rumex crispus	curly dock	N	FAC
	Sonchus oleraceus	Common Sow thistle	N	UPL
	Symphyotrichum chilense	Pacific Aster	Y	FAC
	Taraxacum officinale	dandelion	N	FACU
	Tragopogon porrifolius	Purple Salsify	N	NI
	Trifolium hybridum	Alsike clover	N	FAC
	Trifolium pratense	Red clover	N	FACU
	Vicia sativa	Spring Vetch	N	UPL

APPENDIX AA

Attachment 2: Plant Species Observed On-Site

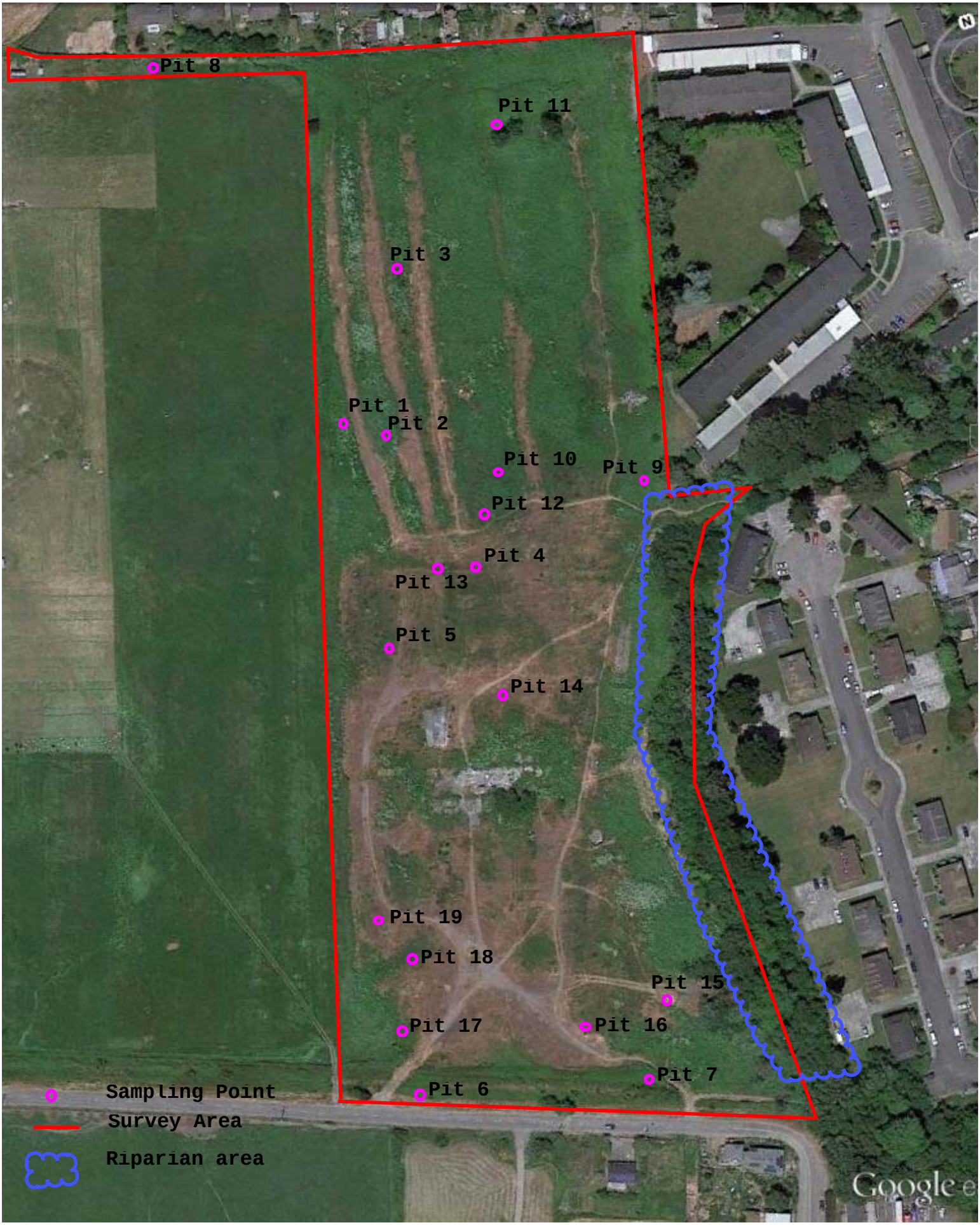
Listing	Scientific Name	Common Name	Native	Wtlnd Stat.
	FERNS and Allies			
	Athyrium filix-femina	Lady Fern	Y	FAC
	Equisetum telmateia	Giant Horse Tail	Y	FACW
	GRASSES			
	Anthoxanthum odoratum	Sweet Vernal Grass	N	FACU
	Avena fatua	Wild oat	N	UPL
	Briza major	Rattlesnake grass	N	UPL
	Briza minor	Little Quacking Grass	N	FAC
	Bromus hordeaceus	Soft Chess	N	FACU
	Bromus racemosus	Smooth Brome	N	NI
	Dactylis glomerata	Orchard grass	N	FACU
	Festuca arundinaceae	Tall fescue	N	NI
	Festuca microstachys	Small fescue	Y	NI
	Holcus lanatus	common velvet grass	N	FAC
	Hordeum brachyantherum	Meadow Barley	Y	FACW
	Lolium multiflorum	Italian Ryegrass	N	UPL
	Phalaris arundinacea	Canary Reed Grass	N	FACW
	Poa pratensis	Kentucky Bluegrass	N	FAC
	SEDGES			
	Cyperus eragrostis	Flat sedge	Y	FACW

Attachment 3:

Location of Sampling Points

Attachment 3 Location of Sampling Points

ATTACHMENT 3

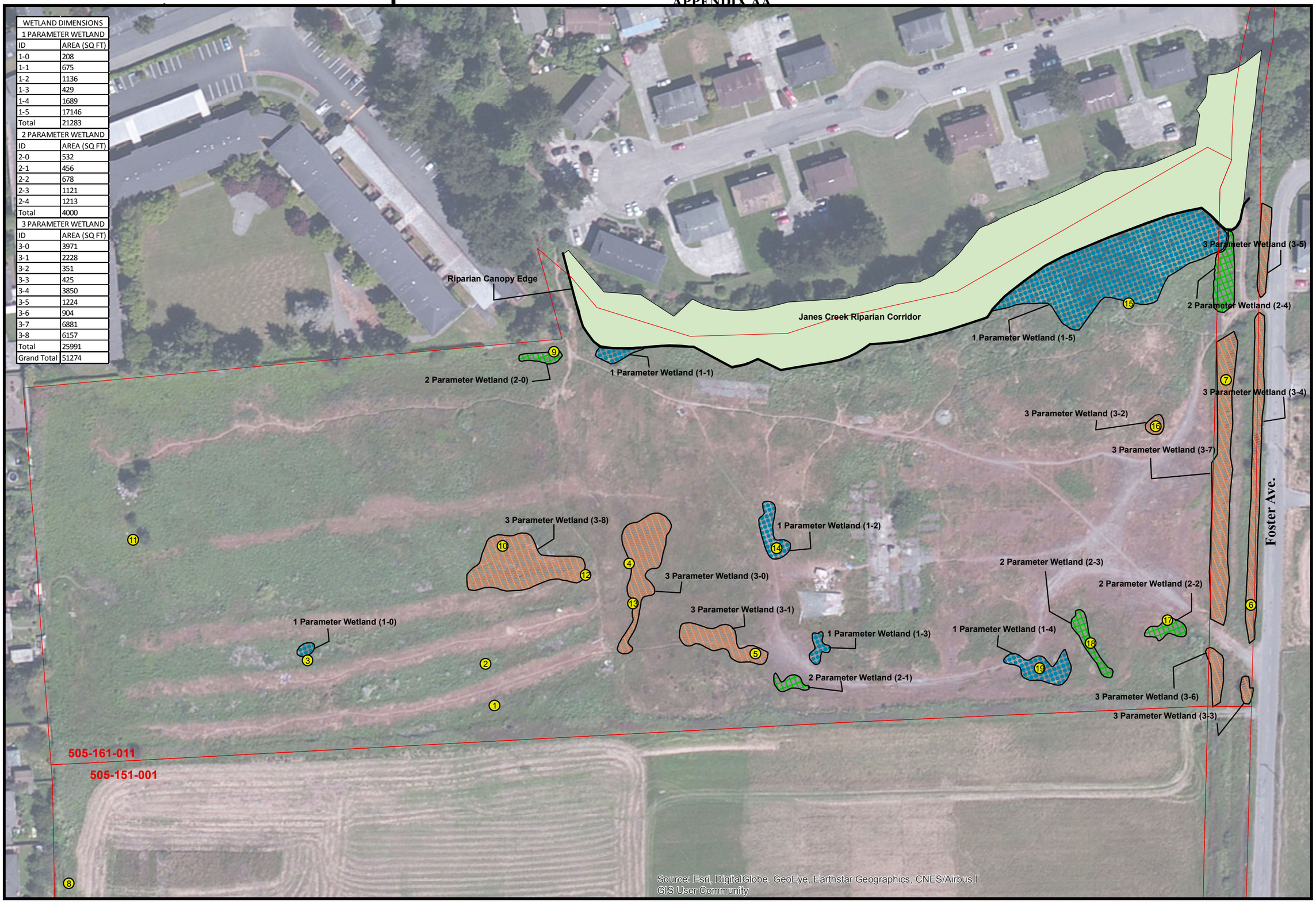


Attachment 4:

Wetland Map

Attachment 4 Wetland Map

WETLAND DIMENSIONS	
1 PARAMETER WETLAND	
ID	AREA (SQ FT)
1-0	208
1-1	675
1-2	1136
1-3	429
1-4	1689
1-5	17146
Total	21283
2 PARAMETER WETLAND	
ID	AREA (SQ FT)
2-0	532
2-1	456
2-2	678
2-3	1121
2-4	1213
Total	4000
3 PARAMETER WETLAND	
ID	AREA (SQ FT)
3-0	3971
3-1	2228
3-2	351
3-3	425
3-4	3850
3-5	1224
3-6	904
3-7	6881
3-8	6157
Total	25991
Grand Total	51274



FOSTER AVENUE CREEKSIDE HOMES ANNEXATION

DRAWING BY

STREAMLINE PLANNING

1062 G Street Suite I
Arcata, CA 95570

TEL: 707.822.5785
FAX: 707.8225786

1 Parameter Wetland

<all other values>

3 Parameter Wetland

Pit Sample

Attachment 4

February 2016

APPENDIX BB

Streamline
Planning Consultants
A Division of SHN Engineers & Geologists

Reference: 016071

February 27, 2017

Chris Dart
Danco Communities
5251 Ericson Way
Arcata, CA 95521

Subject: **Wetland Assessment for Ennes Park Expansion (APN 505-151-009 and 505-284-009)**

Dear Chris Dart:

On February 15, 2017, Streamline Planning staff visited the site at Ennes Park on the corner of Stewart Ave. and Wyatt Lane, Arcata, CA, to scope the site for potential wetlands (Attachment A Figure 1; Attachment B, Photo 1). While this visit was not intended to be a full wetland delineation, four test pits were dug across the site and fully described (Attachment A, Figure 2). The site was traversed from east to west, paying particular attention to vegetation and topography, as well as potential park expansion areas and wetland mitigation sites. The four test pits were representative of the pasture that makes up the area within Assessor's parcel numbers 505-151-009 and 505-284-009 where any future park development would occur. Upon examination of the pits, Streamline staff determined that the homogenous site conditions and lack of wetland parameters warranted no additional field work to document environmental constraints within the park expansion parcels.

Wetland delineation methods described in the *U.S. Army Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987) and *The Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)* (Army Corp of Engineers [ACOE], 2010) were used to identify potential wetlands and other waters. The routine method for wetland delineation described in the ACOE 1987 manual was used to identify potential wetlands within the study area. The ACOE method relies on a three-parameter approach, in which criteria for hydrophytic vegetation, hydric soils, and wetland hydrology must each be met (present at the point of field investigation) to conclude that an area qualifies as a wetland. Test pits (TPs) were analyzed for these three parameters and observed information was recorded on Wetland Determination Data Forms (Attachment C). Within the City of Arcata only two wetland parameters are needed for an area to be considered wetland. The proposed park expansion area was analyzed using the City of Arcata's two parameter wetland determination standard.

The site is open grassland that is mowed annually (Attachment B; Photograph 1). The United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) does not have wetlands mapped within the project area (Attachment A, Figure 3). Elevations throughout the project area are on average 25 feet above mean sea level.

The entire potential park expansion area was assessed (parcels 505-151-009 and 505-284-009). This area was completely covered with pasture grasses and forbs, with a mix of facultative plant species and more upland plant species (See Attachment B, Photograph 1). Facultative vegetation is common on upland areas in Humboldt County within bottomland agricultural parcels with an annual average of 40 inches of rain, combined with many foggy days during the dry season. Three of the four test pits were dominated by hydrophytic vegetation; however all test pits lacked hydric soils and hydrology, reflecting the slightly raised gently sloping nature of the parcel, and well drained soils (Attachment A, Figure 1; Attachment B, Photos 1 and 2; and Attachment C, Data Sheets).

Plant species composition lacked diversity and was somewhat evenly distributed across the site. Facultative species such as *Festuca perennis* and *Agrostis stolonifera* dominated the site, as well as *Festuca arundinacea*, possibly reflecting the agricultural use of the parcel, and the cultivation of pasture grasses (See Attachment B, Photograph 1). Lesser dominance by more upland vegetation was present at each test pit. This included species such as *Geranium dissectum* [NL], *Plantago lanceolata*, *Daucus carota*, and *Taraxicum officinale*. Three of the four test pit areas were dominated by facultative vegetation, with dominance similar at each test pit. Test pit four had higher dominance by *Plantago lanceolata*, and therefore was not considered dominated by wetland vegetation.

Soils were consistent across the entire site in depth, color, and structure. The only noticeable change was in texture, although this was slight. The two southern TPs were silt loams throughout, while the two northern TPs were loam. Soils across the entire parcel were deep, dark, and well drained. All soils had a matrix color of 10YR 3/2 from 0-24+ inches with no redox features. Soil texture and color was homogenous for the entire 24 inches at each TP (See Attachment C, Data Sheets; Attachment B, Photo 2).

Hydrology indicators were lacking throughout the entire study area. The site was relatively flat, with an average two percent slope from northeast so southwest. Two of the TPs (TPs 1 and 3) were excavated in apparent low spots, however no indication of hydrology or hydric soils was observed. Soils were extremely well drained across the site. Heavy rains and abnormally wet weather occurred within the days preceding the site visit. Even with several inches of rain within the previous week, no water table was observed, even at a depth of 24 inches.

TPs were placed in order to better characterize the conditions across the entire area potentially used in the expansion of Ennes Park. This included depressions, sloped areas, and locations with higher dominance by hydrophytic vegetation. Four pits were deemed sufficient in characterizing the park expansion area due to the homogenous nature of the vegetation, soils, and hydrology across the entire area.

Based on this site assessment, no wetlands exist within the proposed park expansion area on parcels 505-151-009 and 505-284-009. Soils were well drained and hydrology was not present, preventing the development of wetlands within the study area. Hydrophytic vegetation across the parcel are typical of coastal pasture land and represent past agricultural use of the parcels, rather than developing or existing wetland conditions across the study area.

Sincerely,

Streamline Planning Consultants, a Division of SHN Consulting Engineers & Geologists, Inc.

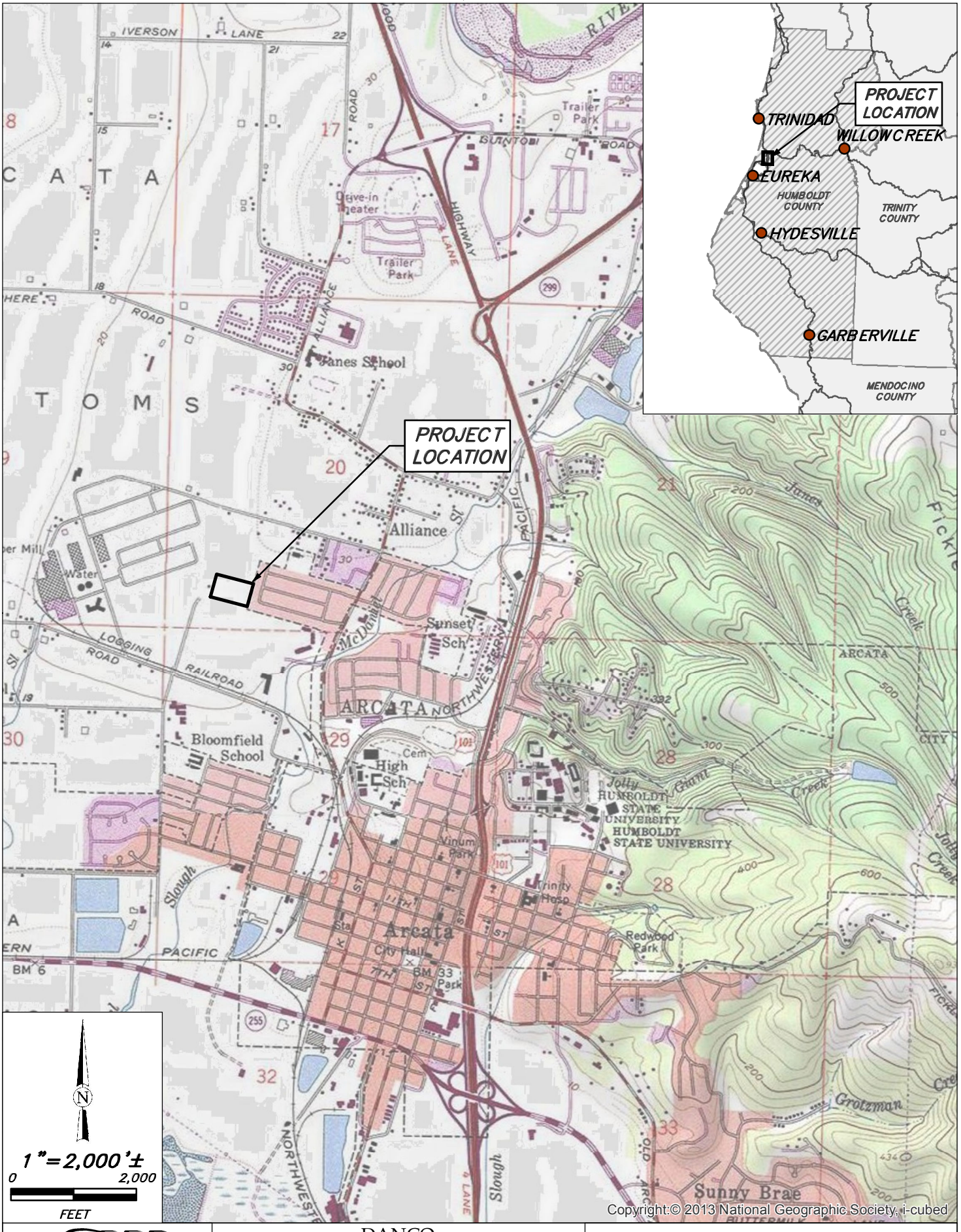
Joseph Saler
Biologist, Wetland Technician

JLS: ceg

Attachments:
- A — Figure 1 – Project Location Map, Figure 2 – Site Map, Figure 3 – National Wetlands Inventory
- B — Site Photographs
- C — Wetland Determination Data Forms

A Figures

APPENDIX BB



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SHN Consulting Engineers & Geologists, Inc.	DANCO Ennes Park Expansion Wetland Assessment Arcata, California	Project Location Map SHN 016071
	February 2017 | Figure1_ProjectLocationMap	Figure 1

APPENDIX BB

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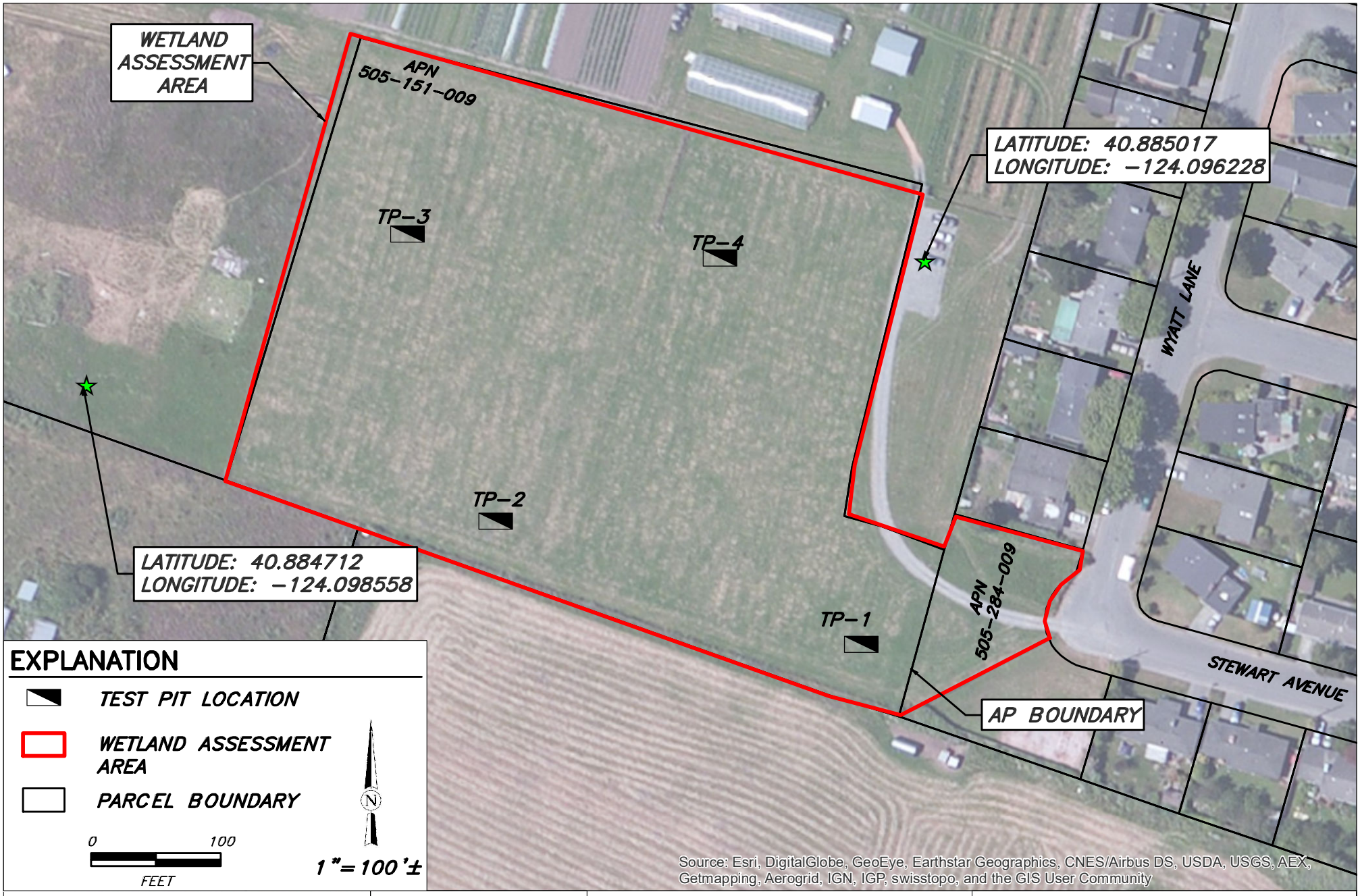

NOTE: PARCEL DATA FROM HUMBOLDT COUNTY GIS (2017); PARCEL BOUNDARIES MAY NOT BE ACCURATELY REPRESENTED.

Consulting Engineers & Geologists, Inc.

DANCO
Ennes Park Expansion Wetland Assessment
Arcata, California

Site Map
SHN 016071

February 2017	Figure2_SiteMap	Figure 2

U.S. Fish and Wildlife Service
National Wetlands Inventory

APPENDIX BB

Figure 3: Ennes Park NWI Map

February 24, 2017

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

B Site Photographs

APPENDIX BB

Photo 1: TP1 site looking west. **Note mowed grass within agricultural setting and similar vegetation composition across the site.**

Photo 2: TP3 Representative soil profile. **Note homogenous soil structure to a depth of 24 inches. No water table present.**

C Wetland Determination Data Forms

APPENDIX BB

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Ennes Park City/County: Arcata, Humboldt Sampling Date: 2/15/17

Applicant/Owner: DANCO State: CA Sampling Point: TP 1

Investigator(s): Joseph Sater, Sam Polly Section, Township, Range: T6N, R1E, NW¼ Sec. 29

Landform (hillslope, terrace, etc.): Flat, Alluvial plain Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR): Lat: 40.8847 Long: -124.0971 Datum:

Soil Map Unit Name: NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: Recent Heavy rains preceeding week.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: ____)			
1. Festuca perennis	70	✓	FAC
2. Raphanus sativa	1		UPL
3. Geranium dissectum	1		NL
4. Plantago lanceolata	2		FACU
5. Silybum marianum	1		NL
6. Trifolium repens	3		FAC
7. Daucus carota	1		FACU
8.			
9.			
10.			
11.			
	79 = Total Cover		39.5 / 15.8
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 21

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ____	x 1 =	____
FACW species ____	x 2 =	____
FAC species ____	x 3 =	____
FACU species ____	x 4 =	____
UPL species ____	x 5 =	____
Column Totals: ____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ___ 3 - Prevalence Index is ≤3.0[1]
- ___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ 5 - Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

APPENDIX BB

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-24	10YR 3/2	100					SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX BB

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Ennes Park City/County: Arcata, Humboldt Sampling Date: 2/15/2017

Applicant/Owner: DANCO State: CA Sampling Point: TP2

Investigator(s): Sam Polly, Joseph Sater Section, Township, Range: T6N, R1E, NW4 Sec. 29

Landform (hillslope, terrace, etc.): Flat, Alluvial plain Local relief (concave, convex, none): Concave Slope (%): 0-2

Subregion (LRR): Lat: 40.8847 Long: -124.0971 Datum:

Soil Map Unit Name: NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____

Hydric Soil Present? Yes ____ No X

Wetland Hydrology Present? Yes ____ No X

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks: Rainfall totals abnormally high for year and preceeding week

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: ____)			
1. Plantago lanceolata	15		FACU
2. Agrostis stolonifera	30	✓	FAC
3. Holcus lanatus	17		FAC
4. Festuca perennis	25	✓	FAC
5. Festuca arundinacea	8		FAC
6. Trifolium repens	1		FAC
7. Daucus carota	1		FACU
8. Geranium dissectum	1		NL
9. Taraxicum officinale	2		FACU
10.			
11.			
	100 = Total Cover		50/20
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ 5 - Wetland Non-Vascular Plants[1]
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

APPENDIX BB

SOIL

Sampling Point: TP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-24	10YR 3/2	100					SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX BB

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Ennes Park City/County: Arcata, Humboldt Sampling Date: 2/15/17
Applicant/Owner: DANCO State: CA Sampling Point: TP3
Investigator(s): Joseph Sater, Sam Polly Section, Township, Range: T6N, R1E, NW¼ Sec. 29
Landform (hillslope, terrace, etc.): flat; Alluvial plain Local relief (concave, convex, none): None Slope (%): 0-1
Subregion (LRR): Lat: 40.8847 Long: -124.0971 Datum:
Soil Map Unit Name: NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:
Rainfall totals abnormally high for year and preceeding week

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: ____)			
1. Plantago lanceolata	15		FACU
2. Geranium dissectum	3		NL
3. Holcus lanatus	15		FAC
4. Dactylis glomerata	15		FACU
5. Agrostis stolonifera	22	✓	FAC
6. Taraxicum officinale	10		FACU
7. Daucus carota	3		FACU
8. Trifolium hybridum	2		FAC
9. Lotus corniculatus	1		FAC
10.			
11.			43
	86 = Total Cover		17.2
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 14

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 0 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ 5 - Wetland Non-Vascular Plants[1]
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

APPENDIX BB

Sampling Point: TP3

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-24	10YR 3/2	100					L	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX BB

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Ennes Park City/County: Arcata, Humboldt Sampling Date: 2/15/2017
Applicant/Owner: DANCO State: CA Sampling Point: TP4
Investigator(s): Sam Polly, Joseph Salter Section, Township, Range: T6N, R1E, NW¼ Sec. 29
Landform (hillslope, terrace, etc.): Flat, Alluvial plain Local relief (concave, convex, none): None Slope (%): 0-1
Subregion (LRR): Lat: 40.8847 Long: -124.0971 Datum:
Soil Map Unit Name: NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X
Hydric Soil Present? Yes ____ No X
Wetland Hydrology Present? Yes ____ No X
Is the Sampled Area within a Wetland? Yes ____ No X

Remarks: Rainfall totals abnormally high for year and preceeding week.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: ____)			
1. Plantago lanceolata	22	✓	FACU
2. Rumex acetosella	14		FACU
3. Holcus lanatus	49	✓	FAC
4. Daucus carota	1		FACU
5. Trifolium repens	3		FAC
6. Geranium dissectum	1		NL
7.			
8.			
9.			
10.			
11.			
	90 = Total Cover		45/18
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

APPENDIX BB

SOIL

Sampling Point: TP4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-24	10YR 3/2	100					Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX CC

Wetland Assessment

Creek Side Homes Project - Hammond Trail Section

Assessor's Parcel Numbers

505-151-001, 505-151-005, & 505-151-006

Arcata, California

Prepared for:

DANCO Communities

November 2018

016071

Reference: 016071

Wetland Assessment

Creek Side Homes Project –
Hammond Trail Section
Assessor's Parcel Numbers
505-151-001, 505-151-005, & 505-151-006

Prepared for:
DANCO Communities

Prepared by:

1062 G Street, Suite I
Arcata, CA 95521
707-822-5785

November 2018

QA/QC:SJP

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Abbreviations and Acronyms

ft^2	square feet
APN	Assessor's parcel number
EIR	Environmental Impact Report
ERDC/CRREL	United States Army Engineer Research and Development Center/Cold Regions Research and Engineering Laboratory
FAC	facultative wetland plant species
FACU	facultative-upland wetland plant species
FACW	facultative-wet wetland plant species
NGTOC	National Geospatial Technical Operations Center
NL	not listed wetland plant species
NR	No Reference
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
TP	test pit
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish & Wildlife Service
USGS	United States Geological Survey

1.0 Introduction

SHN has prepared this Wetland Assessment for a section of the Hammond Trail proposed to be developed by the City of Arcata on Assessor's Parcel Number (APN) 505-151-005 (Figure 1 and Photos 1 & 2, Appendix 1). This site has historically been used as a railroad bed for the Simpson Mill spur tracks. Fieldwork was performed by SHN staff soil scientists and botanists using test pit (TP) excavation and analysis.

1.1 Purpose

The purpose of this Report is to identify potential wetlands and other waters of the United States and State within the study area, as defined by the United States Army Corps of Engineers (USACE) and Natural Resources Conservation Service (NRCS) methodology (three-parameters), as well as the City of Arcata definition (two-parameters). The delineation of these features will help guide the design of the proposed Hammond Trail section to avoid impacts to two- and three-parameter wetlands.

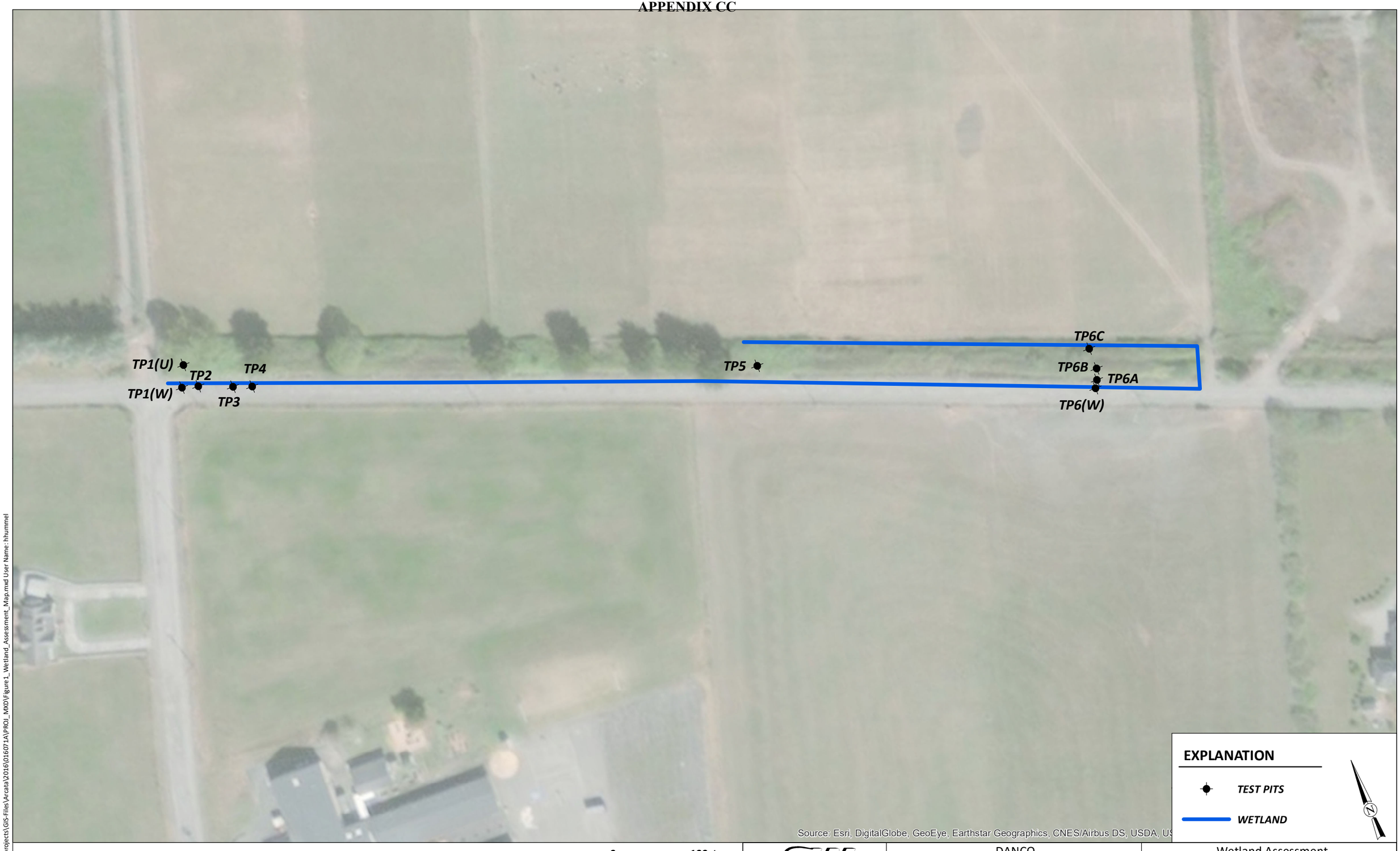
1.2 Project Location

The study area location is in the "Arcata Bottoms" along Foster Avenue directly west of Arcata City limits. The project is 2.9 miles east of the Pacific Ocean, at a 25-foot elevation above sea level, located in the north ½ of the northwest ¼ of Section 20, Township 06 North, Range 01 East, in the Humboldt Baseline and Meridian. The study area is composed of the railroad bed and adjacent drainage ditches to the north and south (Figure 1 and Photo 2, Appendix 1). APN 505-151-005 contains the railroad bed and southern drainage ditch and APNs 505-151-001 and 505-151-006 contain the drainage ditch on the northern side of the railroad bed. The study area central location is at latitude 40.880227° and longitude -124.097270°. Site photos can be seen in Appendix 1.

2.0 Project Description

The Creek Side Homes Project proposes the annexation, redesignation/rezoning, and subdivision of parcel 505-161-011 for single-family, multi-family, and assisted living residential development that would provide housing for approximately 269 residents. Per the California Environmental Quality Act, an Environmental Impact Report (EIR) is being prepared to analyze potential environmental impacts of the proposed residential development and associated offsite improvements. Offsite improvements being analyzed in the EIR include, but are not limited to, the development of portions of the Hammond Trail along Foster Avenue to the west of Arcata City limits.

The Arcata Pedestrian and Bicycle Master Plan (2010) proposes the former rail bed on APN 505-151-005 to be developed as a section of the Hammond Trail. The property owner (Arcata Land Company LLC) will provide an access easement to allow the City to develop and maintain this section of trail. Since the dedication of this easement would reasonably result in the future development of a trail by the City of Arcata, the potential environmental impacts of this improvement are analyzed in the EIR for the Creek Side Home Project. This includes potential impacts to two- and three-parameter wetland on APNs 505-151-001, 505-151-005, and 505-151-006.



0 100 ±

1"=100'±

Consulting Engineers & Geologists, Inc.

DANCO
Foster Avenue Hammond Trail
Arcata, California

Wetland Assessment Map
SHN 016071A

November 2018 | Figure1_Wetland_Assessment_Map | Figure 1

Path: \\eureka\projects\GIS-Files\Arcata\2016\016071A\PROJ_MXD\Figure1_Wetland_Assessment_Map.mxd User Name: hummel

3.0 Environmental Setting

3.1 Site Overview

The study area has been a railroad bed since at least 1941 (City of Arcata, 2016), with railroad ties and tracks still present. The adjacent fields have historically been graded and are currently used for agriculture. Drainage ditches were created parallel to the berm to prevent flooding in the fields and to convey water to Liscom Slough. The majority of these drainage ditches are actively maintained.

3.2 National Wetlands Inventory (NWI)

The USFWS NWI website (United States Fish & Wildlife Service [USFWS], 2017) shows a Palustrine Emergent Persistent Seasonally Saturated wetland system (PEM1B) covering the entire study area (Appendix 2). This general categorization by the NWI is not intended for design or implementation purposes, because of the lack of ground-truthing. In their "Data Limitations, Exclusions and Precaution" statement, it points out that:

> *The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis*
> (USFWS, 2017).

The intention of this Report is to clarify original general NWI boundaries with the addition of onsite soils, hydrology, and vegetation mapping. As found during field analysis, the railroad bed classifies as upland habitat under both USACE and City of Arcata wetland definitions (see Wetland Determination Data Sheets 1(u), 5, 6A, & 6B in Appendix 3).

4.0 Vegetation

Vegetation along the railroad bed ranged from a dominance of Pacific willow (*Salix lasiandra* var. *lasiandra* [FACW]), Himalayan blackberry (R*ubus armeniacus* [FAC]), and velvet grass (*Holcus lanatus* [FAC]) to the west, with the addition of California blackberry (R*ubus ursinus* [FACU]), creeping buttercup (*Ranunculus repens* [FAC]), horsetail (*Equisetum arvense* [FAC]), Monterey pine (*Pinus radiata* [NL]), canary reed grass (*Phalaris arundinacea* [FACW]), and several other species in minor quantities. The area north of the railroad bed is pasture grazed by livestock, dominated by Italian ryegrass (*Festuca perennis* [FAC]) and orchard grass (*Dactylis glomerata* [FACU]). Photos in Appendix 1 show some of the plants observed during the field work. The plants observed within the study area can be found in the Wetland Determination Data Sheets in Appendix 3.

5.0 Geologic and Soil Composition

The study area is located in the "Arcata Bottoms," a broad alluvial plain at the northern end of Humboldt Bay (Figure 1). Published geologic maps of the region indicate that native materials at the site consist of Quaternary aged alluvium (Kelley, 1984). Alluvium on the Arcata Bottoms is described as unconsolidated coarse- to fine-grained sand and silt, with gravel in channel areas; the alluvium may locally interfinger with marine terrace deposits. At least some of the alluvium on the Arcata Bottoms is inferred to be Holocene in age classification and appears to reflect deposition by the Mad River following the most recent sea level low stand.

The underlying soils in the study area have the United States Department of Agriculture (USDA) -NRCS classification of Jollygiant, 0-2 percent slopes (map unit 127); and is described below. The actual soil description at each exploratory soil TP is included in the field data forms found in Appendix 1.

127—Jollygiant, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: q1hl
Elevation: 0 to 160 feet
Mean annual precipitation: 35 to 80 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 275 to 330 days
Farmland classification: Prime farmland if irrigated

Description of Jollygiant
Ap - 0 to 16 inches: silty clay loam
Bg1 - 16 to 33 inches: silty clay loam
Bg2 - 33 to 47 inches: loam
Bg3 - 47 to 63 inches: very fine sandy loam
Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.60 in/hr)
Depth to water table: About 10 to 20 inches
Custom Soil Resource Report 16
Frequency of flooding: Rare
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 10.1 inches)
(USDA, 2017a)

6.0 Discussion and Results

Ten TPs were excavated on February 13 and 14, 2018 (Figure 1). TP excavation occurred during a low rainfall season at 86% of the annual average for the fall through winter period (September through January). Normal circumstances were considered present, because the most recent site disturbances were made over ten years ago, as seen on Google Earth images back to April 1989 (Google Earth, 2016).

The hydrology in the study area has been altered over time by drainage ditches constructed along both the northern and southern edges of the railroad bed (Photos 3 & 4, Appendix 1). The majority of the soil encountered in the TPs was fill, derived from other sources or from sediment deposited in the ditches (Photo 5, Appendix 1). The majority of the ditches in the study area are periodically maintained, except in the few stretches where vegetation has established within the ditch separating the pasture from the railroad bed (Photo 6, Appendix 1). Table 1 lists the TPs and associated parameters met.

6.1 Wetland Pits

All TPs within the ditches met two or three wetland parameters. TPs 1(w), 2, and 3 at the western end of the study area met two parameters showing that they lie at the edge of the three-parameter USACE jurisdictional area. The adjacent TP4, located east of TP3, met all three parameters. Conditions similar to those observed in TP4, such as surface water, existed from this location east to TP6(w) at the eastern edge of the study area, revealing that the majority of the roadside ditch meets USACE wetland criteria. An additional pit, TP6C, was excavated to confirm the similar wetland conditions (three parameters) in the northern ditch that runs along the eastern half of the study area on the north side of the railroad bed. This ditch disappears beginning at the row of Monterey pines as one heads west from the eastern access road, at the southeastern corner of the field (Figure 1). Under City of Arcata Standards, TPs 1(w), 2, 3, 4, 6, and 6C classify as wetlands, with a minimum of two parameters met.

Table 1 Wetland Delineation Results
February 13 & 14, 2018
Creek Side Homes Project - Hammond Trail Section
Arcata, CA

TP	Parameters Met	City of Arcata Wetland	USACE Wetland
1(u)	1	No	No
1(w)	2	Yes	No
2	2	Yes	No
3	2	Yes	No
4	3	Yes	Yes[1]
5	0	No	No
6(w)	3	Yes	Yes[1]
6A	0	No	No
6B	0	No	No
6C	3	Yes	Yes[1]
Total Pits Meeting Wetland Definition		**6**	**3**

1. Palustrine Emergent Persistent

6.2 Upland Pits

TPs 1(u), 5, 6A, and 6B were all excavated on the railroad bed and classified as upland habitats under both USACE and City of Arcata standards. Additionally, TPs 1(w), 2, and 3 classify as upland per USACE criteria.

7.0 Conclusions

Wetland site investigations occurred within the study area on February 13 and 14, 2018. The TP excavations were performed during a low rainfall season. Following the City of Arcata guidelines seeking a minimum of two wetland parameters, the entire ditch system surrounding the railroad bed classifies as wetland (including TPs 1(w), 2, 3, 4, 6(w), and 6C), covering approximately 8,825 square feet (ft^2) within the study area. Of these TPs, only 4, 6(w), and 6C met the USACE three parameter standard. Between the north and south ditches, the railroad bed classifies as approximately 42,700 ft^2 of upland.

8.0 Limitations

The conclusions in this Report represent a "snapshot in time" and it is possible that some species were not present at the time of the fieldwork. This Report documents the investigation by using the best professional judgment of SHN's botanist and soil scientist.

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Site Photographs 1

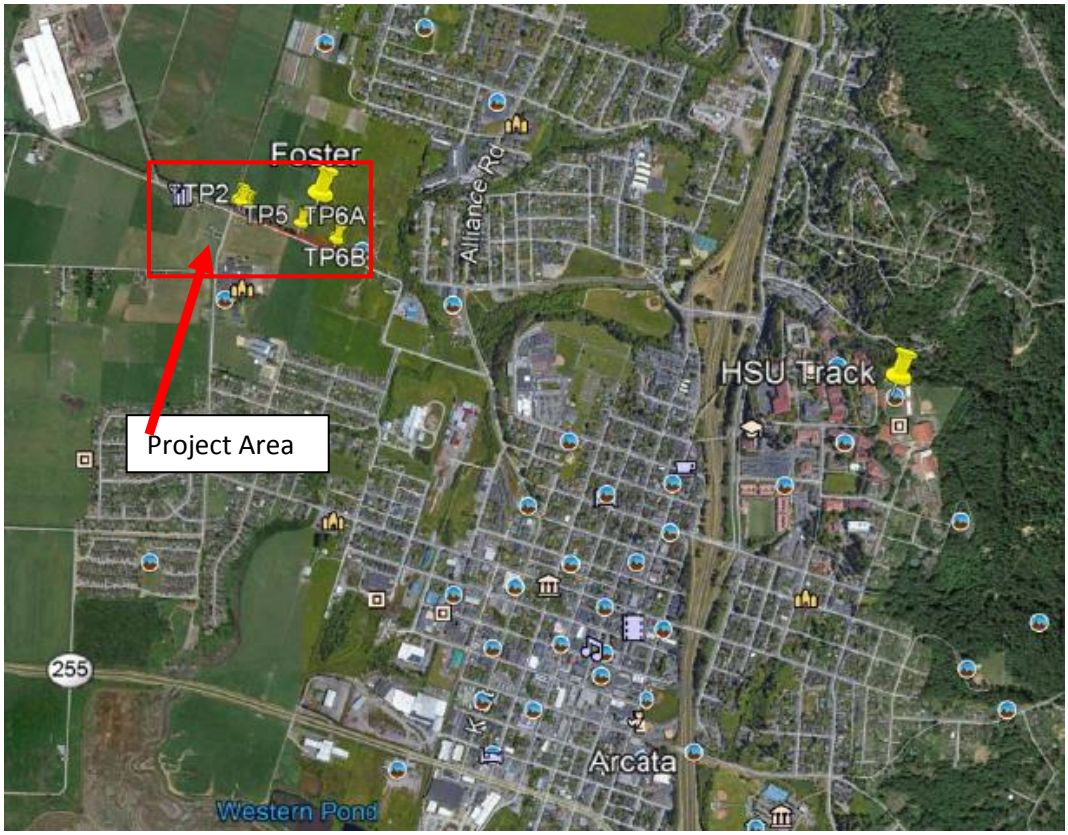

Photo 1: 2016 Aerial image of project location (Google Earth, 2016).

Photo 2: Overview looking east from TP3 down Foster Avenue, along southern ditch.

Photo 3: Central section of southern ditch between TPs 4 and 6(w).

Photo 4: TP6(w) showing canary reed grass and standing water.

Photo 5: TP6B on berm, between TP6A and 6C, showing well-drained gravelly sand and upland vegetation.

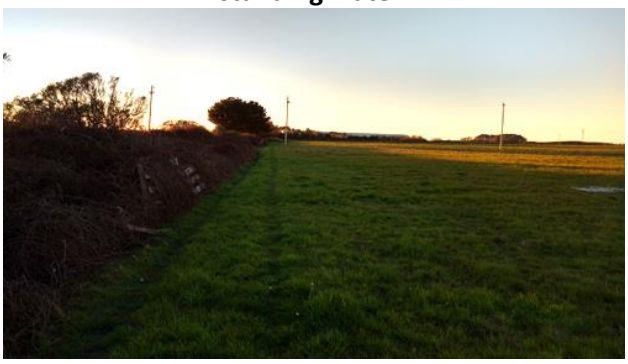

Photo 6: Northern ditch looking west. Ditch lies just inside California blackberry hedgerow.

National Wetlands Inventory 2

U.S. Fish and Wildlife Service
National Wetlands Inventory

APPENDIX CC

Foster Hammond Trail NWI Map

October 31, 2018

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Wetland Delineation Data Forms

3

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Ave. (Trail Ext.) City/County: Arcata, Humboldt Sampling Date: 2-13-18
Applicant/Owner: DANCO, Creekside Homes State: CA Sampling Point: TP1(W)
Investigator(s): Joseph Sailer, Sam Polly Section, Township, Range: Sec. 20+29, T6N, R1E, HBM
Landform (hillslope, terrace, etc.): Alluvial Plain Local relief (concave, convex, none): Convex Slope (%): 0-1
Subregion (LRR): A, MLRA 4B Lat: 40.881229° Long: -124.100403 Datum:
Soil Map Unit Name: 127 Jolly giant, 0-2%, SiCL NWI classification: PEM 1B
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: N 1/2, NW 1/4 sec 29

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft)			
1. Salix lasiandra var. lasiandra	53	✓	FACW
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 5 ft)			
1. Rubus armeniacus	56	✓	FAC
2.			
3.			
4.			
5.			
	56 = Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. Lamiastrum galeobdolon	87	✓	NL
2. Vinca Major	2		NL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	89 = Total Cover		44.5 / 17.8
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 11%

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
X 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

APPENDIX CC

SOIL

Sampling Point: TP(4)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/2	100					GrL	
4-14	10YR 3/2	100					GrGSL	Railroad base fill

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: Railroad base fill

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Fost & Ave (Trail Ext) City/County: Arcata, Humboldt Sampling Date: 2-13-18
Applicant/Owner: DANCO, Greenside Homes State: CA Sampling Point: TP 1 (W)
Investigator(s): Joseph Suler, Sam Polly Section, Township, Range: Sec. 20+29, T6N, R1E, HBM
Landform (hillslope, terrace, etc.): Alluvial plain Local relief (concave, convex, none): Concave Slope (%): 0-1
Subregion (LRR): A, MLRA 4B Lat: 40.881157 Long: -124.100304 Datum:
Soil Map Unit Name: NWI classification: PEM 1B
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes ____ No X
Wetland Hydrology Present? Yes X No ____
Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiandra var. lasiandra	37	✓	FACW
2.			
3.			
4.			
	37 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5 ft)			
1. Rubus armeniacus	45%	✓	FAC
2. Rubus ursinus	18	✓	FACU
3.			
4.			
5.			
	63 = Total Cover		3.5 / 12.6
Herb Stratum (Plot size: 5 ft)			
1. Helminthotheca echioides	1		FAC
2. Holcus lanatus	32	✓	FAC
3. Convolvulus arvensis	4		NL
4. Symphyotrichum chilense	3		FAC
5. Plantago lanceolata	4		FACU
6. Allium triquetrum	1		NL
7. Vicia hirsuta	1		NL
8. Equisetum arvense	1		FAC
9. Stachys ajugoides	2		Obl.
10. Vicia sativa	2		UPL
11. Chamerion angustifolia	2		FACU
12. Juncus effusus	3		FACW
2.			
	56 = Total Cover		28 / 11.2

% Bare Ground in Herb Stratum 44%

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
X 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: TP 1W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	10YR 3/2	100					SiL	
9-22+	10YR 3/1	77	10YR 3/3	23	C	M	SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks: This portion of ditch appears slightly elevated, w/ no standing H_2O, as compared to east of this location.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): 14 in

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): Surface

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX CC

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Ave. (Trail Ext) City/County: Arcata, Humboldt Sampling Date: 2-13-18
Applicant/Owner: DANCO Creekside Homes State: CA Sampling Point: 2
Investigator(s): Joseph Sater, Sam Polly Section, Township, Range: Sec 20+29, T6N, R1E, HBM
Landform (hillslope, terrace, etc.): Alluvial plain (Floodside) Local relief (concave, convex, none): Concave Slope (%): 0-1
Subregion (LRR): A, MLRA 4B Lat: 40.881117° Long: -124.100373° Datum:
Soil Map Unit Name: NWI classification: PEM 1B
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft)			
1. Salix lasiandra var. lasiandra	29	✓	FACW
2.			
3.			
4.			
	29 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5ft)			
1. Rubus armeniacus	27	✓	FAC
2. Rubus ursinus	8	✓	FACU
3.			
4.			
5.			
	35 = Total Cover		17.5/7
Herb Stratum (Plot size: 5ft)			
1.			
2. Chamerion angustifolia	2		FACW
3. Symphyotrichum chilense	7	✓	FAC
4. Equisetum arvense	5	✓	FAC
5. Festuca arundinacea	3		FAC
6. Holcus lanatus	4		FAC
7. Convolvulus arvense	8	✓	NL
8. Cirsium vulgare	2		FACU
9.			
10.			
11.			
	31 = Total Cover		15.5/6.2
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 69% (Rubus thicket)

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across All Strata: 6 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ____

Remarks:

APPENDIX CC

SOIL

Sampling Point: TP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 2/1	100					Loam	
5-20+	10YR 3/1	93	N4/	2	D	M	L	
			10YR 3/6	5	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): 14 inches

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): 12.5in

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Ave (Trail Extension) City/County: Arcata, Humboldt Sampling Date: 2/13/2018
Applicant/Owner: DANCO Creekside Homes State: CA Sampling Point: TP 3
Investigator(s): Joseph Sater, Sam Polly Section, Township, Range: Sec 20+29, T6N, R1E, HBM
Landform (hillslope, terrace, etc.): Alluvial plain, Roadside ditch Local relief (concave, convex, none): Concave Slope (%): 0-1
Subregion (LRR): A, MLRA 4B Lat: 40.881077° Long: -124.100164° Datum:
Soil Map Unit Name: NWI classification: PEM 1B
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 5ft)			
1. Rubus ursinus	10	✓	FACU
2. Rubus armeniacus	36	✓	FAC
3.			
4.			
5.			
	46 = Total Cover		23/9.2
Herb Stratum (Plot size: 5ft)			
1. Holcus lanatus	32	✓	FAC
2. Ranunculus repens	7		FAC
3. Equisetum arvense	6		FAC
4. Cirsium vulgare	1		FACU
5. Plantago lanceolata	1		FACU
6. Phalaris arundinacea	3		FACW
7.			
8.			
9.			
10.			
11.			
	51 = Total Cover		25.5/10.2
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 49%

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
X 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

APPENDIX CC

SOIL

Sampling Point: TP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/1	100					CL	
4-20	10YR 3/1	81	10YR 3/3	19	C	M	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): 13 inches

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): 12.5 in

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX CC

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Ave. (Trail Extension) City/County: Arcata, Humboldt Sampling Date: 2/13/18

Applicant/Owner: DANCO, Creekside Homes State: CA Sampling Point: TP4

Investigator(s): Sam Polly, Joseph Sater Section, Township, Range: Sec. 20+29, T6N, R1E, HBM

Landform (hillslope, terrace, etc.): Alluvial plain (roadside) Local relief (concave, convex, none): Concave Slope (%): 0-1

Subregion (LRR): A, MLRA 4B Lat: 40.881052° Long: -124.100084 Datum:

Soil Map Unit Name: NWI classification: PEM 1B

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft)			
1. Pinus radiata	7	✓	NL
2.			
3.			
4.			
	7%	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5 ft)			
1. Rubus armeniacus	29	✓	FAC
2. Rubus ursinus	13	✓	FACU
3.			
4.			
5.			
	42	= Total Cover	21/8.4
Herb Stratum (Plot size: 5 ft)			
1. Ranunculus repens	20	✓	FAC
2. Holcus lanatus	24	✓	FAC
3. Dipsacus fullonum	1		FAC
4. Achillea millefolium	2		FACU
5. Equisetum arvense	10		FAC
6. Plantago lanceolata	1		FACU
7. Vicia sativa	1		UPL
8.			
9.			
10.			
11.			
	59	= Total Cover	29.5/11.8
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____	= Total Cover	

% Bare Ground in Herb Stratum 41%

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ 5 - Wetland Non-Vascular Plants[1]
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: TP 2 (W) 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/1	96	5YR 3/4	4	C	PL	Loam	
6-20	N4/	65	10YR 3/3	35	C	M	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- X Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes X No ____ Depth (inches): 6in.

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): Surface

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Ave. (Trail Ext.) City/County: Arcata, Humboldt Sampling Date: 2/13/2018
Applicant/Owner: DANCO Creekside Homes State: CA Sampling Point: TP 5
Investigator(s): Sam Polly, Joseph Saler Section, Township, Range: Sec. 20+29, T6N, R1E, HBM
Landform (hillslope, terrace, etc.): Alluvial Plain, railbed Local relief (concave, convex, none): Convex Slope (%): 0-1
Subregion (LRR): A, MLRA 4B Lat: 40.880564° Long: -124.098149° Datum:
Soil Map Unit Name: NWI classification: PEM 1B
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: On Railroad bed 5ft south of rails

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus radiata	30	✓	NL
2.			
3.			
4.			
	30 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5ft)			
1. Rubus ursinus	30	✓	FACU
2. Rubus armeniacus	35	✓	FAC
3.			
4.			
5.			
	65 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Anthoxanthum odoratum	5	✓	FACU
2. Equisetum arvense	8	✓	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	13 = Total Cover 6.5 / 2.6		
Woody Vine Stratum (Plot size: /)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 87 (Heavy litter)

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 5 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

APPENDIX CC

SOIL

Sampling Point: TP5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-5	10YR 2/2	100					GrL	
5-15+	10YR 3/2	100					VGrGSL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Very dry, elevated

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Ave (Trail Ext.) City/County: Arcata, Humboldt Sampling Date: 2/14/2018
Applicant/Owner: DANCO Creekside Homes State: CA Sampling Point: TP 6 (wet)
Investigator(s): Sam Polly, Joseph Sater Section, Township, Range: Sec. 20+29, T6N, R1E, HBM
Landform (hillslope, terrace, etc.): Alluvial Plain (roadside) Local relief (concave, convex, none): Concave Slope (%): 0-1
Subregion (LRR): A, MLRA 4B Lat: 40.880130° Long: -124.096804° Datum:
Soil Map Unit Name: NWI classification: PEM 1B
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 5ft)			
1. Rubus ursinus	5	See Note Below	FACU
2.			
3.			
4.			
5.			
	5 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Phalaris arundinacea	70	✓	FACW
2. Juncus effusus	10		FACW
3. Sonchus oleraceus	2		UPL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	82 = Total Cover		41/16.4
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 18 %

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
- ____ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ 5 - Wetland Non-Vascular Plants[1]
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Rubus ursinus growing from higher elevation, does not reflect conditions at this TP.

APPENDIX CC

SOIL

Sampling Point: TP6(W)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/1	100					L	
3-20+	10YR 3/1	74	5YR 4/4	26			CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- X Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes X No _____ Depth (inches): 12in

Water Table Present? Yes X No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Ave. (Trail Ext) City/County: Arcata, Humboldt Sampling Date: 2/14/2018
Applicant/Owner: DANCO Creekside Homes State: CA Sampling Point: TP 6A
Investigator(s): Joseph Sater, Sam Polk Section, Township, Range: Sec. 20+29, T6N, R1E, HBM
Landform (hillslope, terrace, etc.): Alluvial plain Local relief (concave, convex, none): Convex Slope (%): 50%
Subregion (LRR): A, MLRA 4B Lat: 40.880149° Long: -124.096797° Datum:
Soil Map Unit Name: NWI classification: PEM 1B
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X
Hydric Soil Present? Yes ____ No X
Wetland Hydrology Present? Yes ____ No X
Is the Sampled Area within a Wetland? Yes ____ No X

Remarks: Edge of railroad bed, just out of wetland

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 5ft)			
1. Rubus ursinus	45	✓	FACU
2.			
3.			
4.			
5.			
	45 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Phalaris arundinacea	42	✓	FACW
2. Chamerion angustifolium	1		FACU
3. Equisetum arvense	4		FAC
4. Dipsacus fullonum	1		FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	48 = Total Cover		24/9.6
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 52%

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

APPENDIX CC

SOIL

Sampling Point: TP 6A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12.5	10YR 3/1	100					CL	
12.5-26	10YR 3/1	77	10YR 3/4	23	C	M	CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): 14 in

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): 3 in

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Ave (Trail Ext.) City/County: Arcata, Humboldt Sampling Date: 2/14/18
Applicant/Owner: DANCO Creekside Homes State: CA Sampling Point: TP 6B
Investigator(s): Sam Pelly, Joseph Saler Section, Township, Range: Sec. 20+29, T6N, R1E, HBM
Landform (hillslope, terrace, etc.): Alluvial plain, RR bed Local relief (concave, convex, none): Convex Slope (%): 0-1
Subregion (LRR): A, MLRA 4B Lat: 40.880188° Long: -124.096775 Datum:
Soil Map Unit Name: NWI classification: PEM 1B
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X
Hydric Soil Present? Yes ____ No X
Wetland Hydrology Present? Yes ____ No X
Is the Sampled Area within a Wetland? Yes ____ No X

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 5ft)			
1. Baccharis pilularis ssp. consanguinea	45	✓	NL
2. Rubus ursinus	55	✓	FACU
3.			
4.			
5.			
	100 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Equisetum arvense	5	✓	FAC
2. Dipsacus fullonum	1	✓	FAC
3. Galium aparine	1		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	8 = Total Cover		4/16
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 92% (Leaf litter)

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5 - Wetland Non-Vascular Plants[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

APPENDIX CC

SOIL

Sampling Point: TP6B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	2.5Y 3/2	100					VGr CSL	
12-20+	10YR 3/1	100					Sil	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Foster Ave. (Trail Ext.) City/County: Arcata, Humboldt Sampling Date: 2/13/18
Applicant/Owner: DANCO Creekside Homes State: CA Sampling Point: TP 6C
Investigator(s): Joseph Sater, Sam Polly Section, Township, Range: Sec. 20+29, T6N, R1E, HBM
Landform (hillslope, terrace, etc.): Alluvial plain Local relief (concave, convex, none): Concave Slope (%): 0-1
Subregion (LRR): A, MLRA 4B Lat: 40.880228° Long: -124.096770° Datum:
Soil Map Unit Name: NWI classification: PEM 1B
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____
Is the Sampled Area within a Wetland? Yes X No ____

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 5 ft)			
1. Rubus Ursinus	75	✓	FACU
2.			
3.			
4.			
5.			
	75% = Total Cover		
Herb Stratum (Plot size: 5 ft)			
1. Rumex crispus	1		FAC
2. Juncus effusus	3	✓	FACW
3. Equisetum arvense	2	✓	FAC
4. Hypochaeris radicata	1		FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	7 = Total Cover 3.5 1.4		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 93%

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 67% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
- X 2 - Dominance Test is >50%
- ____ 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ 5 - Wetland Non-Vascular Plants[1]
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:
Rubus Ursinus rooted at higher elevation, does not reflect ditch conditions.

APPENDIX CC

SOIL

Sampling Point: TP6C

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-5	10YR 3/1	100					SiL	Granular structure
5-20	N3/	81%	N4/	2	D	M	SiL	
			10YR 3/6	17	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1) **(except MLRA 1)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) **(LRR A)**
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- X Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) **(LRR A)**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes X No ___ Depth (inches): 3 inches

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): Surface

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX CC

Eureka, CA | Arcata, CA | Redding, CA | Willits, CA | Coos Bay, OR | Klamath Falls, OR

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APPENDIX DD

0161205001-11030

FINAL WETLAND MITIGATION AND MONITORING PLAN FOR FOSTER AVENUE, LLC, CREEKSIDE HOMES ASSESSOR PARCEL NUMBER (APN) 505-161-11 ARCATA, CALIFORNIA

August 2006

Prepared for:

Chris Dart
Danco Builders
5251 Ericson Way
Arcata, California 95521

Prepared by:

Winzler & Kelly Consulting Engineers
633 Third Street
Eureka, California 95501-0417
(707) 443-8326

FINAL WETLAND MITIGATION AND MONITORING PLAN FOR FOSTER AVENUE, LLC, CREEKSIDE HOMES ASSESSOR PARCEL NUMBER (APN) 505-161-11 ARCATA, CALIFORNIA

Prepared for Applicant:

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Lia Webb
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Reviewed by:

Misha Schwarz
Project Manager

Applicant's Designated Agent:

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633 Third Street
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(707) 443-8326

August 2006

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(California Engineering Company [CEC], July 28, 2006)
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Appendix B Groundwater Monitoring Data

SUMMARY

The property designated as Assessor's Parcel Number (APN) 505-161-11 is located northwest of the intersection of Alliance Road and 17th Street, in Arcata, California. Janes Creek borders the southeastern side of the proposed development parcel.

The project proposes to annex parcel APN 505-161-11 to the City of Arcata, modify the zoning, and subdivide the parcel for the development of residential lots, housing units, new residential streets, and a public roadway extension. To allow for the various aspects of the proposed development, wetland areas will be filled and impacted. A total of 33,412 square feet (0.77 acres) of two and three parameter seasonal wetlands will be filled in total, associated with the proposed site development. The mitigation plan proposes to create 0.85 acres (37,000 feet^2) of wetlands in an on-site area on the property, adjacent to Janes Creek.

This conceptual mitigation plan is prepared for future use as part of the Section 404 Permit for the U.S. Army Corps of Engineers (COE). The mitigation project includes grading, planting, and five years of additional monitoring on the mitigation site.

PROJECT DESCRIPTION

Responsible Parties

Foster Avenue, LLC, is the owner of the project site and is the responsible party for development of the project site and implementation of mitigation plan. The proposed mitigation area is on-site of the subject parcel. The working contact for Foster Avenue, LLC, is Chris Dart, Danco Builders, 5251 Ericson Way, Arcata, California 95521, (707) 822-9000. Misha Schwarz and Lia Webb of Winzler & Kelly Consulting Engineers, 633 Third Street, Eureka, California 95501, (707) 443-8326, have prepared this Mitigation and Monitoring Plan.

Location

The project site is located in the Arcata North USGS 7.5 minute quadrangle, within the northwest ¼ of Section 29 and the southwest ¼ of Section 20 of Township 6 North and Range 1 East. The 16-acre property designated as Assessor's Parcel Number (APN) 505-161-11 is located adjacent to the east boundary of the City of Arcata and is proposed for annexation. Access to the site is provided by traversing west on 17th Street off of Alliance Road, which then leads to the project site on Foster Avenue. Janes Creek borders the southeastern side of the proposed development parcel. The parcel is within the Sphere of Influence and the Urban Services Boundary of the City of Arcata. The property is not in the Coastal Zone.

Proposed Project

The project proposes to annex the parcel APN 505-161-11 to the City of Arcata, modify the zoning, and subdivide the parcel for the development of residential lots, housing units, new residential streets, and a public roadway extension as detailed on the site plan (Appendix A, Sheet 1 of 5). A new subdivision access road will be provided off of Foster Avenue.

To allow for the various aspects of the proposed development, wetland areas will be filled and impacted. A total of 33,412 square feet (0.77 acres) of two and three parameter seasonal wetlands will be filled in total, associated with the proposed site development. Three grading scenarios

were analyzed during the mitigation site design that varied in side slope and resulting total mitigation acreage. The three grading options were presented to the City of Arcata Creeks and Wetlands Committee at an October 6, 2005 committee meeting. The Committee indicated that the preferred option is the 3:1 side slope scenario because although it would result in a comparatively less total mitigation acreage (with a 110% replacement value), the more gentle slope ensures slope stability and mitigation area success (Table 1).

Table 1: Impact Acreage of Wetlands to be Filled Versus Mitigation Acreage

Filled Wetland Type	Acres	Square Feet	Notes / Location
3-parameter	0.36	15,524	Wetland pockets scattered throughout development area
2-parameter	0.41	17,888	Ditch at southern edge of property and several others scattered throughout development area
Total Wetlands Filled	**0.77**	**33,412**	
Mitigation Wetland	0.85	37,000	3:1 side slopes, 110 % replacement

Site Characteristics

Jurisdictional Areas

See Site Plan (Appendix A) for project area and proposed wetland areas to be filled. Natural Resources Management Corporation (NRM) delineated the wetland areas on May 21-24 and July 8, 2004. As stated by NRM in the delineation report, the definition of a wetland on the project site may be subject to a number of different jurisdictional definitions, namely the 2-parameter City of Arcata definition and the 3-parameter Army Corp of Engineers definition (NRM, 2004). NRM additionally identified 1-parameter wetlands on site for informational and planning purposes. The 1-parameter wetland areas do not exhibit yearlong standing water, lack hydric soils, and were defined by dominant vegetation of poison hemlock and blackberry. These one-parameter wetlands were not included in total acreage of wetlands to be filled, as they do not meet the jurisdictional agencies (City of Arcata and COE) definitions of a wetland.

A total of 33,412 square feet (0.77 acres) of 2-parameter and 3-parameter wetlands will be filled as a result of the proposed project. All impacts to wetlands will be mitigated as outlined in this mitigation and monitoring plan.

Aquatic Functions

Janes Creek is a small third order stream that borders the southeastern side of the proposed project parcel. Lower Janes Creek has been greatly modified from pre-development conditions. A fish habitat study at the project site rated the Creek value in the vicinity of the project from fairly good habitat to poor habitat. The reaches of the creek immediately upstream and downstream of the project site have nearly complete shade canopy and are virtually devoid of reed canary grass. Shading has prevented canary grass encroachment and preserved low flow channel habitat. The existence of a floodplain, even a relatively small one, allows a portion of storm flow volume to spread over bank, a process that helps to reduce in-channel velocities and allows fish to temporarily use off-channel habitat to escape high storm flow velocities, an important benefit to over-wintering juvenile salmonids. The creation of floodplain benches to create additional flood storage can result

in fish entrapment as the creek level drops and is therefore not recommended as a mitigation alternative for this proposed project. Additionally, floodplain benches as a project alternative would effect mature riparian vegetation in most section of the creek (on site).

The scattered 3-parameter wetland areas that will be impacted as a result of the proposed project are the result of past heavy equipment use on the parcel and uneven compaction of fill material, and are considered atypical (NRM, 2004). Additionally, some of the impacted wetlands are 2-parameter ditches, and several 2-parameter wetlands are on compacted fill. The wetland areas formed on compacted gravel fill as well as the "ditch" wetlands have low aquatic function and are not connected hydrologically to Janes Creek or other wetland areas.

Hydrology and Topography

The project site is located on an uplifted alluvial plain. The majority of the project site is more or less flat, with elevations ranging from approximately 20 to 29 feet above sea level (asl). Elevations from the bed of Janes Creek to the top of the bank range from approximately 11 to 26 feet (asl) (Kelly-O'Hern Associates, 2001). On the project site the creek is well incised and the 100-year flood plain line is at the top of bank in most locations. Janes Creek is a small low gradient year round creek that also carries storm water from residential areas and runoff from adjacent agricultural fields during winter months.

Groundwater for the site typically remains lower than 3 feet below ground surface, yet fluctuating to within one foot in the upland areas and from 4 to 12 inches in the wetland areas for most of the year. Variations in depth to groundwater are due to the compacted fill that exists at the surface of the project site. The absence of distinct geologic variations or changes in topography at the project site indicates a low-lying groundwater gradient, with the slight grade sloped towards the creek (similar to topography). Groundwater monitoring well data collected by Pacific Watershed Associates is attached as Appendix B, but is inconclusive in predicting an accurate groundwater gradient slope and direction.

Soils

Fill material (compacted river-run gravel, gravelly silt, wood debris, etc.) caps the parcel to an approximate depth of 1 to 2.5 feet below ground surface (bgs). Below the fill, at approximately 1 to 2.5 foot depth, silt loam to silty clay loam were encountered to a depth of 3 to 4 feet bgs. Very fine loose sand underlies the silty loam in most locations, beginning at an approximate depth of 4 feet bgs.

Vegetation

Three habitat types exist at the project site, each with distinct plant species. The habitat types identified at the site are: disturbed upland, wetland areas ("pockets"), and riparian. The plant communities specific to the habitat types are presented below. Any potential special-status plant species are discussed in the following sub-section titled "Threatened / Endangered Species."

Disturbed Areas

The vegetation across the majority of the parcel is characteristic of "degraded upland," with a dominance of nonnative annual and perennial grasses, herbs, and shrubs. Himalayan blackberry (*Rubus discolor*), California blackberry (*R. ursinus*), sweet vernal grass (*Anthoxanthum odoratum*), soft chess (*Bromus hordeaceus*), annual fescue (*Vulpia* spp.), rose-flowered lotus (*Lotus micranthus*), bird's-foot trefoil (*L. corniculatus*), hairy cat's-ear (*Hypochaeris radicata*),

English plantain (*Plantago lanceolata*), poison hemlock (*Conium maculatum*), riverbank lupine (*Lupinus rivularis*), wild radish (*Raphanus* spp.), bluegrass (*Poa* spp.), wild rye (*Lolium* spp.), and wild teasel (*Dipsacus fullonum*) are the most commonly observed species on the parcel.

Riparian
A strip of riparian vegetation surrounds Janes Creek, and common plants in this area include red alder (*Alnus rubra*), willow (*Salix* spp.), Himilayan blackberry, reed canary grass (*Phalaris arundinacea*), goose grass (*Galium aparine*), creeping buttercup (*Ranunculus repens*), lady fern (*Athyrium filix-femina*), water parsley (*Oenanthe sarmentosa*), small-flowered bulrush (*Scirpus microcarpus*), and others. Many of the native trees and shrubs in the riparian area were planted by Redwood Community Action Agency (Eureka, CA) during restoration efforts in 1995 (Mad River Biologists, 2000).

Wetlands
The vegetation of the scattered wet areas on the parcel consists primarily of pennyroyal (*Mentha pulegium*) and water foxtail (*Alopecurus geniculatus*). Other topographic low areas on the parcel are dominated by blackberry (*Rubus* spp.) and other "wetland-oriented" species such as curly dock (*Rumex crispus*), creeping buttercup (*Ranunculus repens*), giant horsetail (*Equisetum telmateia*), and northern willow herb (*Epilobium ciliatum*). Most of the wetlands occur on compacted fill material.

Threatened / Endangered Species
Known wildlife use consists primarily of commonly occurring land birds found in coastal Humboldt County. No raptor nests or threatened or endangered bird or mammal species are known to exist at the site.

No rare, threatened or endangered plants occur at the project site. Sensitive plant species that could occur at the site (USGS 7.5 Minute Arcata-North Quad) include Point Reyes birds beak (*Cordylanthus maritimus* ssp. *palustris*), Humboldt Bay wallflower (*Erysimum menziesii* ssp. *eurekense*), beach layia (*Layia carnosa*), and Humboldt Bay owl's clover (*Castilleja ambigua* ssp. *humboldtiensis*) (USFWS, 2005). No habitat occurs in the project area to support any of these species (i.e., salt marsh or sand dunes).

Species-status fish species, including coast cutthroat (*Oncorhynchus clarki clarki*) and coho (*Oncorhynchus kisutch*) have historically occurred in Janes Creek. Present habitat use at the project site is likely limited to migration and occasional juvenile rearing. Coho adults returning to the hatchery on Jolly Giant Creek have been occasionally reported to stray to Janes Creek , which enters Arcata Bay only about one-half mile from Jolly Giant Creek. A single tagged coho carcass, originally released into Jolly Giant Creek as a smolt reared in the Arcata wastewater pond hatchery, was found in a spawned-out condition in Janes Creek in fall 1984. In June of 1985, coho juveniles were found in substantial numbers about one mile upstream of the project site, near the confluence of the north and south forks (Klein, 2004).

The riparian area around the creek provides for quality fish habitat, roughness elements (such as large woody debris or boulders which provide, among other things, over-wintering refuge from high stream flow velocities), shade canopy, and runoff filtration. The proposed project will not likely adversely affect coho and will not destroy or adversely modify critical habitat in the stream or the surrounding riparian vegetation. Janes Creek will be impacted in two locations from the

proposed project. An extension of Foster Avenue will mandate a crossover of Janes Creek with an arched culvert. As proposed, the mitigation area will connect to Janes Creek on the central eastern portion of the property. Limited bank protection (rip-rap) at this location will be necessary.

MITIGATION DESIGN

Location of Mitigation Site

The mitigation area is located in an on-site upland area adjacent to Janes Creek.

Basis of Design

The project site has scattered wetland areas that are difficult to impossible to avoid by the proposed project and the required wetland setback of 50 to 100 feet would make the project infeasible.

An alternative to the proposed on-site mitigation area was evaluated in the planning process of the project. An off-site wetland mitigation area on the agricultural parcel adjacent to the west was considered, but would have resulted in permanently converting land used for agricultural purposes to wetlands and is outside the City limits. The alternative off-site mitigation area is potentially still available, but the on-site mitigation is favored. The on-site mitigation area matches the impact area in soils and elevation. The on-site mitigation area will convert a disturbed and compacted upland area adjacent to Janes Creek into a native wetland habitat and will have higher biological value than the impacted wetlands and the original disturbed upland habitat. The proposed mitigation area adjacent to Janes Creek is consistent with the Janes Creek Linear Park as mentioned in the City of Arcata Creeks Management Plan and Parks Master Plan.

Three grading design scenarios were analyzed for the wetland mitigation area that varied in side slope and resulting total mitigation acreage. The original plan for 1:1 side slopes from existing ground surface into the created wetlands were compared with variations in the side slope of 1:1, 2:1, 3:1, and a combination scenario. Lessening the slope of the side bank results in a reduction of the total created wetland area. A combination of 1:1 and 2:1 slopes would maintain a 1.5:1 mitigation ratio (150 percent replacement), as preferred as a minimum replacement ratio by the City of Arcata, while providing the benefits of less steep side slope. The 1:3 slope is the preferred and proposed option (as indicated by the City of Arcata Creeks and Wetlands Committee, October 6, 2005 meeting) as it satisfies concerns of the City of Arcata in regards to slope steepness while maintaining greater than 1:1 wetlands replacement ratio. Although the preferred scenario will result in a comparatively less total mitigation acreage , the more gentle slope ensures slope stability and mitigation area success.

Mitigation Site Characteristics

<u>Ownership Status</u>

Foster Avenue, LLC, is the owner and operator of the project and mitigation sites. After the grading and planting is completed, the wetland area will be part of the larger parcel, which is proposed for subdivision. After the mitigation and monitoring period of five years is over the COE and the City of Arcata must approve the success of the mitigation area.

Jurisdictional Delineation

The wetland areas at the project site were delineated on May 21-24 and July 8, 2004. The U.S. Army Corps of Engineers (COE) has not verified the delineation. The specific location of the mitigation area is confirmed to be upland based on the original delineation (NRM, 2004).

Aquatic Functions

The mitigation area is on the development parcel; therefore, the aquatic functions for mitigation area are similar as for the project site (presented above). The mitigation area is located at a minimum of 50 feet east of the development area. The area proposed for mitigation has been delineated as an upland area (NRM, 2004). The site is in close proximity to Janes Creek. Currently the area functions minimally for water filtration for runoff progressing towards the creek area.

Hydrology and Topography

The general hydrology and topography for the mitigation project area is presented above in existing conditions for the project site. The existing groundwater conditions within the proposed mitigation can be more specifically analyzed by assuming a flat surface and extrapolate based on Pacific Watershed Associates groundwater monitoring well data collected in the area adjacent to the proposed mitigation wetlands (Appendix B). Based on these data, it appears groundwater underlying the mitigation area currently fluctuates drastically depending on sustained rainfall, and can vary from as close as four inches and on average remaining from 4 to 8 feet below ground surface (bgs) in the winter yet can drop to as low as 10 feet bgs in the summer. These groundwater fluctuations are not presented on the site plan cross sections as the well locations were not surveyed and groundwater data was gathered only during a one year time period. Further details on existing groundwater conditions in the proposed mitigation are would require additional borings with in this area coupled with year long monitoring to evaluate seasonal fluctuations.

Soils

The soils in the mitigation area are the same as presented above for the project site.

Vegetation

The mitigation area is characterized by the upland disturbed habitat, as described above for the project site. The mitigation site is adjacent to the wetland riparian area, also previously described.

Present and Historical Uses of Mitigation Area

The project site was historically used for the location of a lumber mill (North Coast Exports) and although the parcel has been vacant for over 30 years, past land use has influenced the site's present environmental setting. Fill material (compacted river-run gravel, gravelly silt, wood debris, etc.) caps the parcel to a depth of approximately 4 feet in some places (LACO, 2002). Building foundations are still visible.

Present and Proposed Uses of All Adjacent Areas

The agricultural parcel directly adjacent to the west of the project site (APN 505-151-01) has been used consistently for livestock grazing purposes. The site is proposed to remain as open space, with potential agricultural area and nature trails (still in planning phase). Further to the west are additional open agricultural fields. Residential housing is situated on the north and east side of

the parcel. To the south is Foster Avenue, with open fields and a few scattered houses bordering the road to the south. No changes to adjacent land uses are known at this time.

Created / Restored Habitats

Compensation Ratios

The compensation ratio for the wetlands fill is approximately 1.1 to 1 and the proposed mitigation is summarized in Table 1. Approximately 0.85 acres of wetlands will be created on-site.

Long-Term Goal(s)

Habitat enhancement / creation will include three main elements:

1) Create 0.85 acres of wetlands at the on-site mitigation area.
2) Connect the new wetland area to Janes Creek to allow for stormwater flow into the mitigation site while allowing escape routes for fish; therefore ensuring no fish entrapment occurs as a result of the proposed mitigation area.

Aquatic and Wildlife Functions

The wetland mitigation area will be of higher functional value than the compacted wetland areas being filled. The new wetland mitigation area will be hydrologically connected to Janes Creek and will retain flood waters during storm events, will function for groundwater recharge, serve as native wetland habitat, slow surface flow, and additionally filter surface runoff. The well established and deep rooted wetland and riparian vegetation in 2-parameter wetlands adjacent to mitigation site will not be significantly impacted by the mitigation site as a result of the steepening of adjacent slope. The low groundwater gradient (and corresponding flat topography), cool coastal climate with short summer season, available soil moisture, and low hydraulic conductivity soils will ensure that the mitigation area will not deplete groundwater conditions from the adjacent wetland areas.

Long-term mitigation wetland survival and stability will depend on vigorous vegetation establishment. Palustrine habitats created the first year will be available immediately for wildife use. The maturity of the palustrine seasonal habitat will occur in approximately three to five years. The riparian trees will provide habitat for land birds and other wildlife in approximately three to ten years. The mitigation area will widen the wildlife corridor through the project area.

Hydrology / Topography

Based on the mitigation site groundwater monitoring data presented in Appendix B, the approximate grading depth of from 3 feet to as deep as 8 feet below existing ground surface will create seasonal wetland hydrology for a significant part of the growing season. Open water may exist at times, but a slope of approximately 0.4 percent towards the outlet to the creek will allow for flooding to dissipate into the creek and/or recharge groundwater. Groundwater data collected in the area adjacent to the proposed mitigation area indicates that the created wetland area at the deepest point will be saturated to the surface in the wetter months and will have from zero to four feet of standing water depending on sustained rainfall conditions. In the summer months, ground water will fluctuate from the soil surface to two feet below ground surface. Because of the low groundwater gradient, the sloped lands in the mitigation area will have gradually increasing depths

to groundwater based on vertical distance up from water table as established in the bottom of the mitigation area. The top of bank and upper portion of the slope in the created mitigation area is not included in the total wetland acreage and is not expected to support seasonal wetland hydrology or hydric soils. The grading of the specific mitigation area will significantly change the topography, which is generally flat except for undulations caused by past use and fill. The mitigation area will be graded down ranging from 3 to 8 feet below existing ground surface. Several design scenarios are being considered for the grading of the mitigation area (Table 1) with a 3:1 side slope being the preferred option, per the City of Arcata Creeks and Wetlands Committee, October 6, 2005 meeting.

Soils

Soils at the proposed mitigation site are described above under site characteristics of the project site. The mitigation area will be graded to an approximate depth of 3 to 8 feet below ground surface. It is expected that the soil in the new wetland mitigation area will be predominantly the underlying native Loleta silt loam subsoil in most locations, which will be uncovered during grading. Since the river-run fill cap is estimated to be on average 4 feet deep (bgs) for most of the project site, some areas of the mitigation site will be partially the same as the existing surface soil. The Soil treatment and disposal is discussed below under implementation plan.

Vegetation

Vegetation at the new mitigation site will be managed to have a predominance of native wetland type species. The site will be planted according to the planting plan, presented in Table 3. The vegetation will have higher biological value than the wetland pockets that are proposed for filling.

MONITORING PLAN

Success Criteria

Table 2 provides the yearly criteria to be met, based on a reasonably paced progress towards final success criteria.

Table 2: Annual Performance Criteria

Year	Seasonal Wetland Vegetation Establishment
1	30% cover of native plant species over mitigation area and 30% of all species counted are FAC or wetter
2	35% cover of native plant species over mitigation area and 35% of all species counted are FAC or wetter
3	40% cover of native plant species over mitigation area and 40% of all species counted are FAC or wetter
4	45% cover of native plant species over mitigation area and 45% of all species counted are FAC or wetter
5	50% cover of native plant species over mitigation area and 50% of all species counted are FAC or wetter

Monitoring

Methods
Randomly placed, one-meter square sample plots shall be sampled at 15 locations within the mitigation area each season during June, July, or August. Five dominant plants in each sample plot shall be identified to species, and percent of hydrophytic vegetation and percent cover of native plant species shall be noted. The coverage of the 15 plots shall be averaged and compared to the Annual Performance Criteria.

Monitoring Schedule
The monitoring period will be for five years, beginning approximately 6 to 9 months after initial planting. Monitoring will occur once a year during June, July, or August.

Photo-Documentation
Photographs of the mitigation area during monitoring shall be taken from the same location in the same direction. Photos of each sampling location shall also be taken to document the percent vegetative cover and will be included with the annual report, as deemed necessary.

Maintenance Activities
Green machines and mowers will be used to weed around the riparian plantings and wetland mitigation site, as needed. The weed management will be done once a year in late summer until riparian plants are established. Stakes and mulch collars will help to keep the weeds and mowers away from the plants.

IMPLEMENTATION PLAN

Site Preparation

Avoidance Measures
Direct impacts to Janes Creek will be avoided by the proposed project. The only time that grading will occur in close proximity to the creek is at the juncture where the mitigation area joins in with Janes Creek. This phase of work will occur in summer months when the creek flows are low and no heavy equipment shall operate in the creek. The riparian vegetation that surrounds the creek will be left in place and will provide a buffer around the creek. Riparian vegetation will be removed only to allow for the arch culvert bridge of Janes Creek. The area will be revegetated immediately after construction completion. Little impact to the creek is expected and no long-term impacts will occur.

Soil Disposal
Any excess soil generated during wetland mitigation grading will be removed from the wetland mitigation area and stockpiled for future on site uses or removed completely from the project area.

Soil Treatment
All stockpiles will be covered if rain is pending to prevent sediment-laden runoff from impacting the wetlands and creek areas, in compliance with the SWPPP.

Noxious Plant Removal

There are many non-native plants in existence at the parcel due to adjacent agricultural parcels that are annually seeded and as well the disturbed existing conditions at the subject parcel. Most of the non-native plants within the proposed mitigation area are not identified as "pest plant" species. Patches of poison hemlock (*Conium maculatum)* and Himalayan blackberry (*Rubus discolor)* are present at the project site and are often identified as "pest plants" (NRM, 2004). The site will be completely graded during development and most to all vegetation will be removed, including the identified "pest plants." The mitigation area will be replanted according to the planting plan presented in this report. The remainder of the parcel will be developed with the proposed housing project and re-vegetated according to the developer's landscape plan.

Construction Monitor

Foster Avenue, LLC will oversee the implementation of the proposed project and mitigation based on this mitigation and monitoring plan. After construction, a qualified biologist shall complete wetlands monitoring for a total of five years.

Grading Plan

The mitigation site will be graded to a total depth varying from approximately 3 to 8 feet below ground surface, as shown on the Site Plan (Appendix A, Sheet 2 of 5) and cross sections (Sheets 3 of 5 and 5 of 5).

Planting Plan

Recommended Plants

The wetland area will be planted according to the planting plan shown in Table 3. Red alder (*Alnus rubra*) and big leaf maple (*Acer macrophyllum)* will be planted on the top half of the slope and along the top of bank of the wetland boundary line and will provide a windbreak for the wetland mitigation area. Native willow(s) (*Salix* sp.*)* will be planted mid slope to the bottom of the slope of the mitigation area. Soft stem rush (*Juncus effuses)* and slough sedge (*Carex obnupta)* will be planted along the bottom of the sloped wetland area and within the flat bottom area.

All species will be planted in the late fall or early winter, when the plants are dormant, and after the rains have begun. Table 3 presents specific species to be planted in the wetland area. Also provided is planting location and recommended final spacing.

Source of Propagules

All plants should be obtained from a nursery in a minimum of ½ gallon pots to ensure healthy establishment, with the exception of the willows. Willow cuttings for the mitigation area can be gathered onsite or within 10 square miles and planted with adherence to the following directions.

Willow Planting Instructions

Willow *(Salix sp.)* cuttings can be taken from large vigorous-growing shrubs and trees from December 15 through February 1 (when plants are dormant) prior to bud swelling. The willow-cutting source shall be within a 15-mile radius of the project area. Length of cuttings shall be 3 feet with a minimum ¾ inch diameter at the base and maximum of 3 inches. It is recommended that the bottom of the willow cuttings be cut at a 45-degree angle in order to keep track of the correct orientation of the cutting and to facilitate planting. Cuttings shall be placed in a bucket filled with

water prior to planting to avoid desiccation. Willow cuttings shall be placed with the basal 2/3 of the slip in the ground, with approximately 10-12 inches above the soil surface. If holes are dug or augured for the willows the soil shall be tampered around each willow slip so no air void occurs.

Table 3: Species to Be Planted

Location	Common Name	Species	Spacing (feet)[1,2]
Bottom of Wetland	Soft stem rush	*Juncus effusus*	8-10
	Slough sedge	*Carex obnupta*	8-10
Bottom of Side Slopes (1/3 to 1/2 way up slope)	Willow species	*Salix* sp.	20
Top 1/2 of Side Slope and Top of Bank	Big leaf maple	*Acer macrophyllum*	100
	Red alder	*Alnus rubra*	35

[1] The spacing between plants in the mitigation area is between individual plants. The plant species are to be mixed in some areas. For example, the spacing between the big leaf maple and red alder along the upper slope and top of bank should result in a big leaf maple every 200 feet, yet the red alder may be interspersed at a distance of 35 feet from any other plant.

[2] To fit additional 50% increase in coverage to account for potential plant die off the recommended plant spacing may be decreased or plantings arranged in a zigzag across parcel.

Irrigation Plan
No irrigation is proposed. The planting will occur in the late fall or early winter once rains begin.

Fencing
Protective fencing will be placed at a minimum of three feet west of the wetland mitigation area. The fencing will be a minimum of 3 feet high and constructed of wood split rails.

Signage
Signs will be placed at the mitigation site identifying the area as a sensitive habitat and directing people to stay off the planted area. Signs shall be heavy, durable, vandal resistant, and weather resistant (such as baked enamel / embossed sign, porcelain enamel, metal, or equivalent). The sign border, legend, and symbol shall be white and the background shall be a contrasting dark color. Signs will be held by 4 inch by 4 inch or 6 inch by 6 inch wood rough cut Douglas fir posts (or equivalent or better). All posts shall be pressure treated according to AWPA Quality Standard C2 (min. retention of 0.25 lbs per cubic feet) for above ground use, and AWPA Quality Standard C2 (min. retention of 0.40 lbs per cubic feet) for ground contact with ACZA wood preservative. 2 inch diameter galvanized steel pipes or high tensile steel "U" - channel posts with pre-drilled 3/8 inch holes on 1 inch centers may be used in lieu of wood posts.

Implementation Schedule
The development of the mitigation area will be in accordance with the schedule presented in Table 4.

Table 4: Development Time Schedule (Preliminary)

Task	Description	Date[1]
1	Grade mitigation site	June
2	Begin bridge construction	June
3	Place material in fill area	June
4	Complete in-stream work	October
5	Place wetland plants in mitigation area	November
6	Place wetland trees in mitigation area	December / January
7	Complete as-built drawings	February
8	Monitor wetland success	For five years from implementation

[1] Actual dates/years are not yet determined for the proposed project. Months provided are estimates of when the work would be expected to occur.

MONITORING REPORTS

Due Dates

Annual reports of monitoring results shall be submitted yearly. The first annual report shall be delivered by November 1 of the year following the first growing season after planting, and for every year through the five-year monitoring period.

As-built Conditions

A report will be submitted to the City of Arcata and the COE within six weeks of completion of the mitigation site planting describing as-built conditions. A topography map of as-built contours of the mitigation area and planting areas will be provided.

Annual Reports

The report will assess both attainment of yearly target criteria and progress toward final success criteria. If final success criteria are met early, then a request for early completion of mitigation will be made. Photographs of mitigation area taken during monitoring, as described by the monitoring methods, shall be included with the annual report, as necessary to document site conditions.

CONTINGENCY MEASURES

Initiating Procedures

The mitigation area will be evaluated annually against the success criteria proposed herein. If an annual performance criterion (averaged over 15 sample plots) is not met for any year, or if final criteria are not met, a report shall be prepared analyzing the cause of failure and, if necessary, will propose remedial action. Specifically, if success criteria are not met consecutively for three years, remedial actions will be mandated to be implementation of replacement plantings and/or regrading of the site to improve hydrologic conditions. If after the fifth year of monitoring the success criteria are not met, and all feasible onsite remedial measures have been attempted, then additional off-site mitigation (within the same major watershed system) will be sought, at a replacement ratio of 2:1, based on the original impact area (may take into consideration areas of mitigation area that have been successful).

Funding Mechanisms

The property owner, Foster Avenue LLC, will provide funding for installation of the wetland mitigation area and subsequent maintenance and monitoring. Mr. Chris Dart of Danco Builders will be the responsible party.

COMPLETION OF MITIGATION

Notification of Completion

The COE shall be notified when performance criteria have been met at the time the annual report is submitted.

Confirmation

It is the responsibility of the COE to verify or confirm that the wetland mitigation area has been successfully established. A jurisdictional delineation may be required at the completion of the monitoring period

LONG-TERM MANAGEMENT

Property Ownership

The Foster Avenue, LLC parcel will be subdivided and sold as individual lots. The private property owners will then be responsible for maintenance of each individual parcel. No specific long-term maintenance of the wetland areas and enhancement areas is required.

Management Plan

The long-term management plans for the wetland mitigation area is unknown at this point. Foster Avenue LLC will develop long-term plans for the wetland mitigation area in coordination with the City of Arcata, Creeks and Wetland Committee, the Planning Commission, and the City Council.

Site Protection

The wetland mitigation area will be protected from the development by a minimum 50-foot buffer. No buildings or site development features will encroach on this setback (except for the stormwater detention basin and access routes for bikes, walking, nature trails, or emergency access). The wetland mitigation area will be protected from future development and impacts as a result of this buffer zone.

REFERENCES

Kelly O'Hern Associates, 2001. *Topographic Survey for Foster Avenue LLC*. Unpublished survey map, Eureka, CA.

LACO, 2002. *Soils Report for Proposed Foster Avenue Development.*

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USFWS, 2005. *Listed/Proposed Threatened and Endangered Species for the Arcata North Quadrangle (Candidates Included).* United States Fish and Wildlife Service (USFWS).

University of California, 1965. *Soils of Western Humboldt County California.* Department of Soils and Plant Nutrition, University of California, Davis, in cooperation with County of Humboldt.

Appendix A
Figures

Appendix B
Groundwater Monitoring Data