CHEN RYAN

TO: County of San Diego – Department of Public Works

FROM: Monique Chen, PE; Chen Ryan Associates

Phuong Nguyen, PE; Chen Ryan Associates

DATE: February 28, 2019

RE: **13th Street Bridge – Data Validation Memorandum**

Overview

The County of San Diego Department of Public Works, (DPW) in cooperation with the California Department of Transportation (Caltrans) proposes to replace the existing undersized culvert with a bridge where 13th Street/Maple Street crosses the Santa Maria Creek, in the unincorporated community of Ramona in San Diego County. The project consists of improvements to 13th Street/Maple Street between Main Street and Walnut Street and construction of an approximately 480-foot-long bridge over Santa Maria Creek to replace the existing corrugated steel culvert. The bridge and approaches would include a six-foot sidewalk on the west, two 12-foot travel lanes on the bridge, three-foot shoulders on each side of 13th Street, and a 10-foot multi-use trail on the east separated from the travel lane by a concrete barrier and equestrian- railing. The new bridge would be elevated by approximately 10-feet to convey the 100-year storm event based on County and FEMA standards.

Traffic counts for the roadway segments and intersections were conducted on April 9, 2013 to support the 13th Street Bridge Traffic Impact Analysis Report (TIA) prepared by Linscott, Law, & Greenspan Engineers (LLG) (October 2013). Since the counts in the TIA were more than 2 years old, new counts were conducted on January 16, 2018.The purpose of this memorandum is to determine whether or not the results of the 2013 TIA are still accurate and can be relied upon, or if further studies are recommended. A total of seven (7) roadway segments and five (5) intersections were analyzed in the 13th Street Bridge TIA, these roadway segments and intersections are identified below:

Roadways

1. Olive Street, between Maple Street and Pine Street
2. Main Street (SR-67), between 14th Street and 13th Street
3. Main Street (SR-67), between 13th Street and 10th Street
4. Maple Street, between Olive Street and Walnut Street
5. 13th Street, south of Walnut Street
6. 13th Street, north of Main Street (SR-67)
7. Pine Street/10th Street (SR-78), between Olive Street and Main Street (SR-67)

Intersections

1. Maple Street / Olive Street
2. Pine Street / Olive Street
3. Maple Street/13th Street / Walnut Street
4. 13th Street / Main Street (SR-67)
5. 10th Street (SR-78) / Main Street (SR-67)

2013 TIA Analysis Summary

Based on the 13th Street Bridge TIA, all roadway segments would operate at an acceptable LOS with the exception of those roadway segments and intersections denoted below:

Existing Conditions (Year 2013)

Roadway

- None Identified.

Intersection

- None Identified.

Near-Term Conditions (Project Opening Year 2018)

Roadway

- Pine Street/10th Street (SR-78), between Olive Street and Main Street (SR-67) – LOS E without project and LOS B with project.

Intersection

- None Identified.

Long-Term Conditions (Year 2035) – *Note that the 2035 analysis will not change regardless of the current condition traffic volumes as the 2035 traffic volumes used in the 13th Street Bridge TIA were derived from the SANDAG Series 12 County General Plan Update Forecast Year 2050 model. The TIA indicated that based on discussion with SANDAG staff, the Year 2035 is appropriate to use as this scenario included the latest County General Plan land use. See Section 8.1 of the LLG TIA submitted in October 2013, for a detailed methodology of their Horizon Year analysis.*

Roadway

- Main Street, between 14th Street and 13th Street – LOS E;
- Main Street, between 13th Street and 10th Street – LOS F; and
- Pine Street / 10th Street (SR-78) – between Olive Street and Main Street – LOS E without project and LOS B with project.

Intersection

- 10th Street / Main Street (SR-67) – LOS E during the PM peak hour without project and acceptable LOS with project.

LLG did not identify any significant impacts as a result of the 13th Street Bridge project. Additionally, based upon the TIA, both intersection and roadway operations along SR-67 would improve with the construction of the 13th Street Bridge project.

Traffic Volumes Validation - Roadway

Existing Conditions

New traffic counts were conducted on January 16, 2018 for the seven identified roadway segments. Roadway geometrics were also reviewed and were found to match the roadway cross sections identified

in the TIA. **Table 1** provides a comparison between the current (Year 2018) traffic volumes and those studied in the TIA (Year 2013). The roadway daily traffic volume counts for the seven (7) segments are provided in this memorandum as **Attachment A.**

Table 1 Change in Roadway Segment Daily Traffic Volumes & LOS – Existing Counts

Roadway	From	To	Tuesday, 1/16/2018		13th Street Bridge TIA		LOS D Threshold	Difference in Volume	Percent Difference
			Count	LOS	Count	LOS			
Olive Street	Maple Street	Pine Street	3,453	B	2,940	B	7,000	513	17.4%
Main Street (SR-67)	14th Street	13th Street	27,855	D	27,220	C	30,800	635	2.3%
	13th Street	10th Street	26,665	C	26,010	C	30,800	655	2.5%
Maple Street	Olive Street	Walnut Street	1,277	A	1,060	A	7,000	217	20.5%
13th Street	Walnut Street	550 ft North of Main Street	676	B	510	B	1,800*	166	32.5%
	550 ft North of Main Street	Main Street (SR-67)	3,065	B	2,120	B	7,000	945	44.6%
Pine Street/10th Street (SR-78)	Olive Street	Main Street (SR-67)	10,922	E	9,970	D	10,900	952	9.5%

Source: Chen Ryan Associates, Inc., October 2018; 13th Street Bridge TIA, 2013

Notes:
* Per the TIA, this roadway segment capacity is assumed to be ¼ of the Minor Collector capacity to account for existing unimproved (dirt) roadway.
Bold letter indicates unacceptable LOS E or F.
LOS = Level of Service.

As shown in **Table 1**, the daily traffic volume along all roadway segments increased between 2.3% and 44.6% (166 trips and 952 trips). All roadway segments currently operate at acceptable LOS D or better, and the increase in daily traffic volumes would result in one of the segments, Pine Street/10th Street (SR-78) between Olive Street and Main Street (SR-67), to operate at unacceptable LOS E. According to the TIA, the 13th Street Bridge project would reduce traffic volume along this roadway segment, thus a significant impact would not occur along this roadway segment.

Near-Term Conditions

Consistent with the 13th Street Bridge TIA, a five-year period was assumed for the Near-Term Opening Day, thereby yielding a Near-Term Year 2023. An ambient growth rate was applied to the January 2018 counts to arrive at the Near-Term ADT. The growth percentage 2.1% per year was developed from the initial counts conducted in April 2013 to the new counts conducted in January 2018. These growth rates were determined to be reasonable for the location and facility types and were also found to be consistent with the LLG TIA growth rate applied in the initial study in October 2013. As shown in **Table 2** on the following page, all of the roadway segments would continue to operate at LOS D or better with the exception of Pine Street/10th Street (SR-78) between Olive Street and Main Street (SR-67). This segment would operate at LOS E. However, the 13th Street Bridge project would reduce traffic volume along this roadway segment, thus a significant impact would not occur along this roadway segment.

Table 2 Roadway Segment Level of Service Analysis – Near-Term Year 2023 (Project Opening) Scenarios

Roadway	From	To	With Project		Without Project		LOS D Threshold	Significant Impact?
			Volume	LOS	Count	LOS		
Olive Street	Maple Street	Pine Street	4,540	C	3,630	B	7,000	No
Main Street (SR-67)	14th Street	13th Street	29,370	D	29,440	D	30,800	No
	13th Street	10th Street	27,880	D	28,790	D	30,800	No
Maple Street	Olive Street	Walnut Street	2,300	B	1,390	A	7,000	No
13th Street	Walnut Street	550 ft North of Main Street	1,680	A	770	B	1,800*/ 7,000	No
	550 ft North of Main Street	Main Street (SR-67)	4,220	C	3,380	B	7,000	No
Pine Street/10th Street (SR-78)	Olive Street	Main Street (SR-67)	11,200	E	12,110	E	10,900	No

Source: Chen Ryan Associates, Inc., October 2018; 13th Street Bridge TIA, 2013

Notes:
* Per the 13th Street Bridge TIA, this roadway segment capacity is assumed to be ¼ of the Minor Collector capacity to account for existing unimproved (dirt) roadway under the Without Project conditions.
Bold letter indicates unacceptable LOS E or F.
LOS = Level of Service.

Therefore, it can be concluded that from a roadway capacity perspective, the 13th Street Bridge TIA is still valid as no additional traffic impact would occur due to the increase in baseline traffic volumes. No additional analysis is needed.

Traffic Volumes Validation - Intersection

New traffic counts were conducted January 16, 2018 at the five identified study area intersections, and included in Attachment A. Intersections geometrics were also reviewed and were found to match the intersection geometrics identified in the TIA. **Table 3** displays the total intersection approach volumes for the AM and PM peak hours, respectively.

Table 3 Change in Intersection Traffic Volumes – Existing Counts

Intersection	Traffic Control	Peak Hour	Tuesday, 1/16/2018	13th Street Bridge TIA			Difference in Volumes	Percent Difference
				Tuesday, April 9, 2013 Counts	Average Delay (sec.)	LOS		
1. Maple Street & Olive Street	SSSC	AM	187	197	9.0	A	-10	-5.1%
		PM	307	281	9.1	A	26	8.5%
2. Pine Street & Olive Street	Signal	AM	948	942	16.5	B	6	0.6%
		PM	1,222	1096	20.6	C	126	11.5%
3. Maple Street/13th Street & Walnut Street	Yield	AM	121	67	7.1	A	54	80.6%
		PM	60	88	7.0	A	-28	-31.8%
4. 13th Street & Main Street (SR-67)	SSSC	AM	1,638	1601	11.7	B	37	2.3%
		PM	2,187	2205	12.9	B	-18	-0.8%

Table 3 Change in Intersection Traffic Volumes – Existing Counts

Intersection	Traffic Control	Peak Hour	Tuesday, 1/16/2018	13th Street Bridge TIA			Difference in Volumes	Percent Difference
				Tuesday, April 9, 2013 Counts	Average Delay (sec.)	LOS		
5. 10th Street (SR-78) & Main Street (SR-67)	Signal	AM	1,999	1859	30.7	C	140	7.5%
		PM	2,562	2255	37.0	D	307	13.6%

Source: Chen Ryan Associates, Inc., October 2018; 13th Street Bridge TIA, 2013

Notes:
SSSC = Side-Street Stop Controlled, the delay shown is the worst delay experienced by any of the approaches.
LOS = Level of Service.

As shown in Table 3, intersection peak hour approach volumes vary ranging from -31.8% to +80.6% when comparing the 1/6/2018 counts and the counts utilized in the 13th Street Bridge TIA. Due to the variance in traffic volumes, additional intersection analysis was conducted for Existing and Near-Term (project opening year) scenarios in order to provide a definitive conclusion on whether the 13th Street Bridge project would result in any significant traffic impacts at study area intersections due to the increase in baseline traffic volumes.

Intersection LOS Analysis

This section provides an analysis of the intersection traffic conditions both with and without the proposed project. The scenarios analyzed in this section include:

- Existing
- Opening Day (Year 2023) Near-Term Base
- Opening Day (Year 2023) Near-Term Base + Project

Intersection volumes for the Existing, Near-term Base, and Near-Term Base + Project conditions are provided in **Attachments B**, **C**, and **D** respectively.

Since the Near-Term peak hour traffic volumes are higher than the Existing conditions traffic volumes, it is determined that the Near-Term conditions is the worst-case scenario, thus used for traffic impact evaluations.

New Existing Conditions

Table 4 displays intersection LOS and average vehicle delay results for the key study area intersections under Existing conditions. LOS calculation worksheets for Existing conditions are provided in Attachment B**.**

Table 4 Peak Hour Intersection Level of Service Results – Existing Conditions

Intersection	Traffic Control	AM Peak Hour		PM Peak Hour	
		Average Delay (sec.)	LOS	Average Delay (sec.)	LOS
1. Maple Street & Olive Street	SSSC	9.0	A	9.4	A
2. Pine Street & Olive Street	Signal	44.3	D	31.9	C
3. Maple Street/13th Street & Walnut Street	Yield	7.2	A	7.2	A
4. 13th Street & Main Street (SR-67)	SSSC	12.4	B	13.9	B
5. 10th Street (SR-78) & Main Street (SR-67)	Signal	30.6	C	48.1	D

Source: Chen Ryan Associates, Inc., October 2018

Notes:

SSSC = Side-Street Stop Controlled, the delay shown is the worst delay experienced by any of the approaches.
LOS = Level of Service.

As shown, all key study intersections currently operate at LOS D or better under Existing Conditions.

Near-Term Conditions

Table 5 displays intersection LOS and average vehicle delay results for the key study area intersections under Opening Day (Year 2023) Near-Term Base and Opening Day (Year 2023) Base + Project conditions. LOS calculation worksheets for Near-Term conditions are provided in Attachments C & D**.**

Table 5 Peak Hour Intersection Level of Service Results – Opening Day (Year 2023) Near-Term Conditions

Intersection	Traffic Control	AM Peak Hour w/ Project		PM Peak Hour w/ Project		Delay w/o Project (sec) AM/PM	LOS w/o Project AM/PM	Change in Delay (sec)	SI?
		Average Delay (sec.)	LOS	Average Delay (sec.)	LOS				
1. Maple Street & Olive Street	SSSC	9.2	A	9.6	A	8.9 / 9.3	A / A	0.3 / 0.3	No
2. Pine Street & Olive Street	Signal	53.6	D	44.1	D	49.9 / 34.3	D / C	3.7 / 9.8	No
3. Maple Street/13th Street & Walnut Street	Yield / SSSC*	9.5	A	9.3	A	7.2 / 7.1	A / A	2.3 / 2.2	No
4. 13th Street & Main Street (SR-67)	SSSC	12.5	B	13.6	B	12.7 / 14.9	B / B	-0.2 / -1.3	No
5. 10th Street (SR-78) & Main Street (SR-67)	Signal	29.2	C	52.4	D	32.4 / 58.9	C / E	-3.2 / -6.5	No

Source: Chen Ryan Associates, Inc., October 2018

Notes:

*As recommended by the Project, Maple Street / 13th Street / Walnut Street was analyzed as a side-street stop-controlled intersection in the Opening Day (Year 2023) Plus Project scenario with northbound and southbound movements operating as free-flow.
SSSC = Side-Street Stop Controlled, the delay shown is the worst delay experienced by any of the approaches.
LOS = Level of Service.
SI? = Significant Impact?

As shown, all key study intersections are projected to operate at acceptable LOS D or better under Near-Term Plus Project conditions. Intersection delay would *decrease* at the intersections of 13th Street & Main Street (SR-67) and 10th Street (SR-78) & Main Street (SR-67) due to a redistribution of traffic that reduced traffic from these intersections and rerouted them to the proposed 13th Street Bridge, as shown in the initial LLG TIA.

Based on the County of San Diego's Significance Criteria, outlined in the LLG TIA (October 2013), the traffic associated with the proposed project would not cause any intersections to operate at an unacceptable LOS E or F under Near-Term Plus Project conditions. Therefore, no significant project related impacts were identified and no mitigation is required.

Detours, Closures, and Traffic Management Plans

Based on review of the 13th Street Bridge TIA, the project description and the field conditions, we concur with the recommendations provided in the TIA which recommended that a formal construction traffic control plan be prepared based on the County of San Diego Standards and Guidelines. In addition, the following traffic control approach is recommended:

- Detour and advance warning signs should be placed on Main Street, Montecito Road, Maple Street and Walnut Street to inform motorists about potential road closures as well as potential detour routes during the construction of the 13th Street Bridge.
- Detour and advance warning signs should also be provided to inform bicyclists of potential road closures and detours.
- Alternative pedestrian access should be provided and sign/marked, as appropriate.
- Construction activities and road closures would likely result in additional traffic (due to detours) along Main Street and Pine Street / 10th Street. However, these increases are temporary in nature and are not expected to be significant.

Results and Findings

Based on the results of the comparison between the current traffic volumes (January 16, 2018) and those utilized in the 13th Street Bridge TIA (April 9, 2013), no additional analysis would be required from a roadway perspective.

Based on the County of San Diego's Significance Criteria, outlined in the LLG TIA (October 2013), the traffic associated with the proposed project would not cause any intersections to operate at an unacceptable LOS E or F under the Opening Day (Year 2023) Near-Term conditions. Therefore, no significant project related impacts were identified and no mitigation is required, consistent with the findings presented in the initial LLG TIA.

Attachment A
Traffic Count

Chen Ryan Associates

3900 Fifth Avenue, Suite 310 San Diego, CA 92103

Average Daily Traffic

Location: **Olive Street, between Maple Street and Pine Street**

Date: **Tuesday, January 16, 2017** Total Daily Volume: **3453** Description: **Total Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
11	23	10	8	20	97	185	203	222	221	217	224	248	234	240	292	297	300	150	119	54	42	23	13
4	4	5	1	4	21	34	64	72	49	70	52	64	57	69	57	84	92	45	26	16	10	4	6
4	0	3	2	1	22	51	49	54	56	44	62	58	51	51	75	82	92	45	39	16	15	7	3
1	4	2	1	5	21	40	43	47	59	45	54	69	70	75	82	83	62	32	37	13	9	5	1
2	15	0	4	10	33	60	47	49	57	58	56	57	56	45	78	48	54	28	17	9	8	7	3

Date: **Tuesday, January 16, 2017** Total Daily Volume: **1806** Description: **Eastbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
4	11	7	6	11	58	110	111	115	123	103	116	142	116	115	141	154	160	87	60	22	18	10	6
1	0	4	1	4	9	27	38	30	29	34	30	34	27	30	31	51	51	25	9	5	6	3	3
2	0	2	2	1	14	33	27	35	34	21	39	35	27	25	34	37	47	31	14	9	3	2	2
0	4	1	1	1	10	20	24	26	28	21	23	33	35	45	45	38	35	15	26	2	6	3	0
1	7	0	2	5	25	30	22	24	32	27	24	40	27	15	31	28	27	16	11	6	3	2	1

Date: **Tuesday, January 16, 2017** Total Daily Volume: **1647** Description: **Westbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
7	12	3	2	9	39	75	92	107	98	114	108	106	118	125	151	143	140	63	59	32	24	13	7
3	4	1	0	0	12	7	26	42	20	36	22	30	30	39	26	33	41	20	17	11	4	1	3
2	0	1	0	0	8	18	22	19	22	23	23	23	24	26	41	45	45	14	25	7	12	5	1
1	0	1	0	4	11	20	19	21	31	24	31	36	35	30	37	45	27	17	11	11	3	2	1
1	8	0	2	5	8	30	25	25	25	31	32	17	29	30	47	20	27	12	6	3	5	5	2

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Average Daily Traffic

Location: **Main Street (SR-67), between 14th Street and 13th Street**

Date: **Tuesday, January 16, 2017** Total Daily Volume: **27855** Description: **Total Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
126	57	40	103	278	820	1099	1532	1712	1662	1734	1927	1899	1920	2142	2172	2213	2026	1582	1096	715	529	306	165
40	9	10	23	41	145	245	365	435	413	425	446	439	452	505	537	591	546	474	345	200	142	98	40
40	13	12	25	58	192	282	340	446	426	415	455	460	434	520	546	569	538	383	274	172	152	91	45
30	17	4	25	62	209	260	348	410	412	431	486	500	507	537	545	552	482	364	278	183	121	54	44
16	18	14	30	117	274	312	479	421	411	463	540	500	527	580	544	501	460	361	199	160	114	63	36

Date: **Tuesday, January 16, 2017** Total Daily Volume: **13893** Description: **Eastbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
78	28	18	41	74	240	412	654	721	735	798	890	947	999	1133	1177	1209	1134	913	662	417	326	186	101
25	7	2	7	11	40	81	145	188	178	180	197	213	222	267	273	323	287	251	209	111	90	61	31
23	7	6	8	17	46	96	148	189	204	186	223	244	234	277	285	319	299	214	163	99	94	51	21
19	4	3	9	14	66	108	162	167	176	204	224	233	268	278	297	289	277	221	169	107	74	32	32
11	10	7	17	32	88	127	199	177	177	228	246	257	275	311	322	278	271	227	121	100	68	42	17

Date: **Tuesday, January 16, 2017** Total Daily Volume: **13962** Description: **Westbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
48	29	22	62	204	580	687	878	991	927	936	1037	952	921	1009	995	1004	892	669	434	298	203	120	64
15	2	8	16	30	105	164	220	247	235	245	249	226	230	238	264	268	259	223	136	89	52	37	9
17	6	6	17	41	146	186	192	257	222	229	232	216	200	243	261	250	239	169	111	73	58	40	24
11	13	1	16	48	143	152	186	243	236	227	262	267	239	259	248	263	205	143	109	76	47	22	12
5	8	7	13	85	186	185	280	244	234	235	294	243	252	269	222	223	189	134	78	60	46	21	19

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Average Daily Traffic

Location: **Main Street (SR-67), between 13th Street and 10th Street**

Date: **Tuesday, January 16, 2017** Total Daily Volume: **26665** Description: **Total Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
129	71	43	102	282	786	1061	1474	1575	1558	1599	1788	1791	1828	2017	2103	2093	1971	1559	1066	727	549	322	171
36	25	12	24	44	146	244	350	397	392	390	415	420	426	476	543	547	540	461	336	202	152	96	44
39	12	12	27	61	182	258	319	408	402	379	432	438	435	505	499	548	513	382	271	181	151	98	47
33	15	5	23	63	202	251	349	379	360	404	443	457	486	513	511	508	469	367	265	184	125	61	46
21	19	14	28	114	256	308	456	391	404	426	498	476	481	523	550	490	449	349	194	160	121	67	34

Date: **Tuesday, January 16, 2017** Total Daily Volume: **13655** Description: **Eastbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
77	35	21	38	76	232	401	644	693	694	751	865	911	974	1126	1175	1172	1135	917	664	428	333	191	102
23	14	4	8	12	40	80	147	180	169	165	201	214	212	273	296	314	292	248	206	115	94	59	30
21	7	6	7	17	43	91	138	181	195	188	213	236	243	281	271	314	296	220	167	106	93	52	22
18	4	4	7	17	63	108	167	169	149	178	212	218	262	270	280	276	270	226	169	105	76	36	32
15	10	7	16	30	86	122	192	163	181	220	239	243	257	302	328	268	277	223	122	102	70	44	18

Date: **Tuesday, January 16, 2017** Total Daily Volume: **13010** Description: **Westbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
52	36	22	64	206	554	660	830	882	864	848	923	880	854	891	928	921	836	642	402	299	216	131	69
13	11	8	16	32	106	164	203	217	223	225	214	206	214	203	247	233	248	213	130	87	58	37	14
18	5	6	20	44	139	167	181	227	207	191	219	202	192	224	228	234	217	162	104	75	58	46	25
15	11	1	16	46	139	143	182	210	211	226	231	239	224	243	231	232	199	141	96	79	49	25	14
6	9	7	12	84	170	186	264	228	223	206	259	233	224	221	222	222	172	126	72	58	51	23	16

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Average Daily Traffic

Location: **Maple Street, between Olive Street and Walnut Street**

Date: **Tuesday, January 16, 2017** Total Daily Volume: **1277** Description: **Total Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
5	10	6	3	7	40	77	64	85	90	89	94	99	73	89	115	113	113	31	53	10	7	2	2
0	4	4	2	0	11	10	16	25	18	24	19	23	19	29	24	28	26	10	6	3	2	2	0
2	0	0	1	0	14	25	15	25	29	18	27	26	25	14	20	36	60	11	16	2	1	0	2
2	3	2	0	2	7	23	14	15	26	20	26	28	17	27	33	29	16	4	24	2	2	0	0
1	3	0	0	5	8	19	19	20	17	27	22	22	12	19	38	20	11	6	7	3	2	0	0

Date: **Tuesday, January 16, 2017** Total Daily Volume: **651** Description: **Northbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
1	6	3	2	0	17	33	28	34	49	47	46	49	38	37	71	61	63	24	32	4	4	1	1
0	1	2	1	0	2	6	5	9	9	14	9	11	11	12	15	16	11	7	2	1	1	1	0
1	0	0	1	0	7	11	8	12	19	9	18	11	15	5	11	16	32	9	2	0	1	0	1
0	3	1	0	0	2	8	5	6	12	11	10	14	8	15	26	18	14	3	21	1	2	0	0
0	2	0	0	0	6	8	10	7	9	13	9	13	4	5	19	11	6	5	7	2	0	0	0

Date: **Tuesday, January 16, 2017** Total Daily Volume: **626** Description: **Southbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
4	4	3	1	7	23	44	36	51	41	42	48	50	35	52	44	52	50	7	21	6	3	1	1
0	3	2	1	0	9	4	11	16	9	10	10	12	8	17	9	12	15	3	4	2	1	1	0
1	0	0	0	0	7	14	7	13	10	9	9	15	10	9	9	20	28	2	14	2	0	0	1
2	0	1	0	2	5	15	9	9	14	9	16	14	9	12	7	11	2	1	3	1	0	0	0
1	1	0	0	5	2	11	9	13	8	14	13	9	8	14	19	9	5	1	0	1	2	0	0

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3900 Fifth Avenue, Suite 310 San Diego, CA 92103

Average Daily Traffic

Location: **13th Street, South of Walnut Street**

Date: **Tuesday, January 16, 2017** Total Daily Volume: **676** Description: **Total Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
2	2	2	2	1	10	44	33	35	47	48	52	35	35	62	60	72	63	31	22	10	4	4	0
0	0	0	1	0	4	7	6	9	13	9	11	7	6	21	12	19	16	10	5	2	0	2	0
0	0	2	1	0	1	15	9	8	13	9	16	7	12	11	12	25	21	10	8	5	1	2	0
2	1	0	0	0	2	10	11	9	14	10	12	13	9	17	14	19	16	8	7	1	2	0	0
0	1	0	0	1	3	12	7	9	7	20	13	8	8	13	22	9	10	3	2	2	1	0	0

Date: **Tuesday, January 16, 2017** Total Daily Volume: **312** Description: **Northbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
1	1	2	1	0	2	13	15	15	20	20	27	15	18	31	30	33	33	18	10	5	1	1	0
0	0	0	1	0	0	2	3	3	6	2	4	5	2	9	7	6	9	6	3	1	0	1	0
0	0	2	0	0	1	6	5	4	4	3	9	3	6	6	5	12	13	6	1	4	0	0	0
1	1	0	0	0	0	2	5	3	6	3	6	4	5	9	5	9	7	5	5	0	0	0	0
0	0	0	0	0	1	3	2	5	4	12	8	3	5	7	13	6	4	1	1	0	1	0	0

Date: **Tuesday, January 16, 2017** Total Daily Volume: **364** Description: **Southbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
1	1	0	1	1	8	31	18	20	27	28	25	20	17	31	30	39	30	13	12	5	3	3	0
0	0	0	0	0	4	5	3	6	7	7	7	2	4	12	5	13	7	4	2	1	0	1	0
0	0	0	1	0	0	9	4	4	9	6	7	4	6	5	7	13	8	4	7	1	1	2	0
1	0	0	0	0	2	8	6	6	8	7	6	9	4	8	9	10	9	3	2	1	2	0	0
0	1	0	0	1	2	9	5	4	3	8	5	5	3	6	9	3	6	2	1	2	0	0	0

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Average Daily Traffic

Location: **13th Street, North of Main Street**

Date: **Tuesday, January 16, 2017** Total Daily Volume: **3065** Description: **Total Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
2	4	11	10	3	20	83	102	110	221	265	303	281	225	288	270	281	239	176	102	38	20	9	2
0	0	0	2	0	8	18	16	22	50	70	99	101	42	74	57	71	82	61	33	15	2	2	0
0	0	7	4	0	2	26	25	31	48	33	75	71	65	59	59	72	63	52	29	14	5	2	0
0	2	4	0	0	3	14	30	26	60	68	59	53	55	77	76	72	51	31	35	4	5	5	0
2	2	0	4	3	7	25	31	31	63	94	70	56	63	78	78	66	43	32	5	5	8	0	2

Date: **Tuesday, January 16, 2017** Total Daily Volume: **1134** Description: **Northbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
1	1	5	3	2	14	41	58	52	118	110	100	93	87	97	93	101	59	52	27	8	7	4	1
0	0	0	0	0	6	6	6	10	21	36	33	15	16	22	16	33	16	15	7	4	0	1	0
0	0	4	2	0	1	10	14	16	28	15	23	26	24	16	27	22	18	15	12	1	2	2	0
0	0	1	0	0	2	8	18	10	37	28	25	27	24	26	26	20	14	13	6	1	3	1	0
1	1	0	1	2	5	17	20	16	32	31	19	25	23	33	24	26	11	9	2	2	2	0	1

Date: **Tuesday, January 16, 2017** Total Daily Volume: **1931** Description: **Southbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
1	3	6	7	1	6	42	44	58	103	155	203	188	138	191	177	180	180	124	75	30	13	5	1
0	0	0	2	0	2	12	10	12	29	34	66	86	26	52	41	38	66	46	26	11	2	1	0
0	0	3	2	0	1	16	11	15	20	18	52	45	41	43	32	50	45	37	17	13	3	0	0
0	2	3	0	0	1	6	12	16	23	40	34	26	31	51	50	52	37	18	29	3	2	4	0
1	1	0	3	1	2	8	11	15	31	63	51	31	40	45	54	40	32	23	3	3	6	0	1

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Average Daily Traffic

Location: **Pine Street-10th Street (SR-78), between Olive Street and Main Street (SR-67)**

Date: **Tuesday, January 16, 2017** Total Daily Volume: **10922** Description: **Total Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
42	40	25	52	148	374	569	741	647	671	572	675	677	635	803	810	910	835	652	364	297	196	111	76
11	12	4	7	18	59	132	206	184	165	144	188	172	149	171	199	201	252	227	106	77	58	34	23
16	8	12	12	36	90	107	195	154	161	123	167	182	146	204	190	242	236	179	102	77	50	38	13
12	10	4	11	31	91	155	163	158	182	145	171	167	168	230	192	245	201	130	95	74	44	17	19
3	10	5	22	63	134	175	177	151	163	160	149	156	172	198	229	222	146	116	61	69	44	22	21

Date: **Tuesday, January 16, 2017** Total Daily Volume: **5090** Description: **Northbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
20	18	8	29	101	231	326	377	345	316	286	296	331	319	361	382	358	326	233	156	116	81	40	34
7	6	1	3	14	45	81	99	95	70	70	83	83	81	74	97	86	103	79	44	34	27	5	10
8	2	5	6	24	51	65	108	75	90	66	75	96	79	95	80	97	83	67	48	28	21	16	2
5	4	2	8	25	63	93	82	95	81	63	71	86	76	107	90	100	81	46	38	30	17	7	14
0	6	0	12	38	72	87	88	80	75	87	67	66	83	85	115	75	59	41	26	24	16	12	8

Date: **Tuesday, January 16, 2017** Total Daily Volume: **5832** Description: **Southbound Volume**

0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
22	22	17	23	47	143	243	364	302	355	286	379	346	316	442	428	552	509	419	208	181	115	71	42
4	6	3	4	4	14	51	107	89	95	74	105	89	68	97	102	115	149	148	62	43	31	29	13
8	6	7	6	12	39	42	87	79	71	57	92	86	67	109	110	145	153	112	54	49	29	22	11
7	6	2	3	6	28	62	81	63	101	82	100	81	92	123	102	145	120	84	57	44	27	10	5
3	4	5	10	25	62	88	89	71	88	73	82	90	89	113	114	147	87	75	35	45	28	10	13

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BC 18-009
Location: Maple Street & Olive Street

Start Date: 01/16/2018
File Name: 009-01-1

	None Southbound				Olive Street Westbound				Maple Street Northbound				Olive Street Eastbound				
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	0	0	0	0	7	14	0	0	1	0	7	0	0	28	2	0	59
7:15	0	0	0	0	9	11	0	0	0	0	6	0	0	14	0	0	40
7:30	0	0	0	0	7	4	0	0	0	0	6	0	0	17	1	0	35
7:45	0	0	0	0	10	15	0	0	1	0	9	0	0	16	0	0	51
Total	0	0	0	0	33	44	0	0	2	0	28	0	0	75	3	0	185
8:00	0	0	0	0	12	19	0	0	1	0	8	0	0	11	0	0	51
8:15	0	0	0	0	10	7	0	0	1	0	11	0	0	13	3	0	45
8:30	0	0	0	0	7	9	0	0	1	0	6	0	0	16	1	0	40
8:45	0	0	0	0	13	11	0	0	0	0	6	0	0	16	0	0	46
Total	0	0	0	0	42	46	0	0	3	0	31	0	0	56	4	0	182
Grand Total	0	0	0	0	75	90	0	0	5	0	59	0	0	131	7	0	367
Approach%	-	-	-	-	45.5	54.5	-	-	7.8	-	92.2	-	-	94.9	5.1	-	
Total%	-	-	-	-	20.4	24.5	-	-	1.4	-	16.1	-	-	35.7	1.9	-	

Peak hour analysis for the period 07:45 to 08:30

Volume	-	-	-	-	39	50	-	-	4	-	34	-	-	56	4	-	187
Approach%	-	-	-	-	43.8	56.2	-	-	10.5	-	89.5	-	-	93.3	6.7	-	
Total%	-	-	-	-	20.9	26.7	-	-	2.1	-	18.2	-	-	29.9	2.1	-	
PHF				######				0.72				0.79				0.88	

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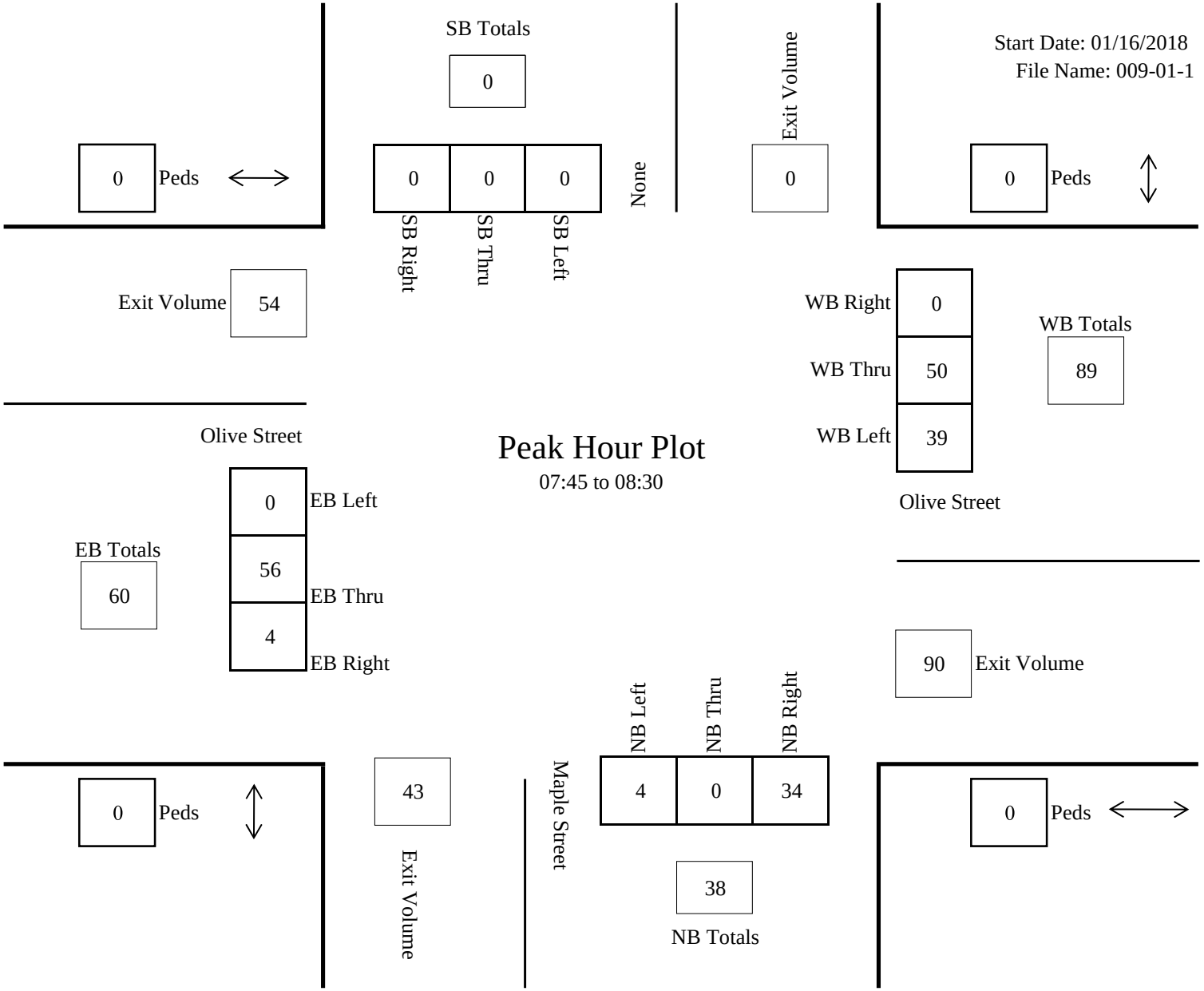
Start Date: 01/16/2018
File Name: 009-01-1



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3900 Fifth Avenue, Suite 210 | San Diego, CA 92103

BC 18-009 Start Date: 01/16/2018

Location: Maple Street & Olive Street File Name: Revised 009-01-2

	None Southbound				Olive Street Westbound				Maple Street Northbound				Olive Street Eastbound				
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	0	0	0	0	12	14	0	0	3	0	14	0	0	24	1	0	68
16:15	0	0	0	0	17	23	0	0	2	0	12	0	0	18	1	0	73
16:30	0	0	0	0	12	26	0	0	1	0	16	2	0	23	0	0	80
16:45	0	0	0	0	7	12	0	0	1	0	11	0	0	22	2	0	55
Total	0	0	0	0	48	75	0	0	7	0	53	2	0	87	4	0	276
17:00	0	0	0	0	12	27	0	0	1	0	10	0	0	23	3	0	76
17:15	0	0	0	0	22	22	0	0	0	0	31	0	0	19	2	0	96
17:30	0	0	0	0	1	26	0	0	0	0	14	0	0	18	2	0	61
17:45	0	0	0	0	5	20	0	0	2	0	5	0	0	21	0	0	53
Total	0	0	0	0	40	95	0	0	3	0	60	0	0	81	7	0	286
Grand Total	0	0	0	0	88	170	0	0	10	0	113	2	0	168	11	0	562
Approach%	-	-	-	-	34.1	65.9	-	-	8.0	-	90.4	1.6	-	93.9	6.1	-	
Total%	-	-	-	-	15.7	30.2	-	-	1.8	-	20.1	0.4	-	29.9	2.0	-	

Peak hour analysis for the period 16:30 to 17:15

Volume	-	-	-	-	53	87	-	-	3	-	68	2	-	87	7	-	307
Approach%	-	-	-	-	37.9	62.1	-	-	4.1	-	93.2	2.7	-	92.6	7.4	-	
Total%	-	-	-	-	17.3	28.3	-	-	1.0	-	22.1	0.7	-	28.3	2.3	-	
PHF				######				0.80				0.59				0.90	

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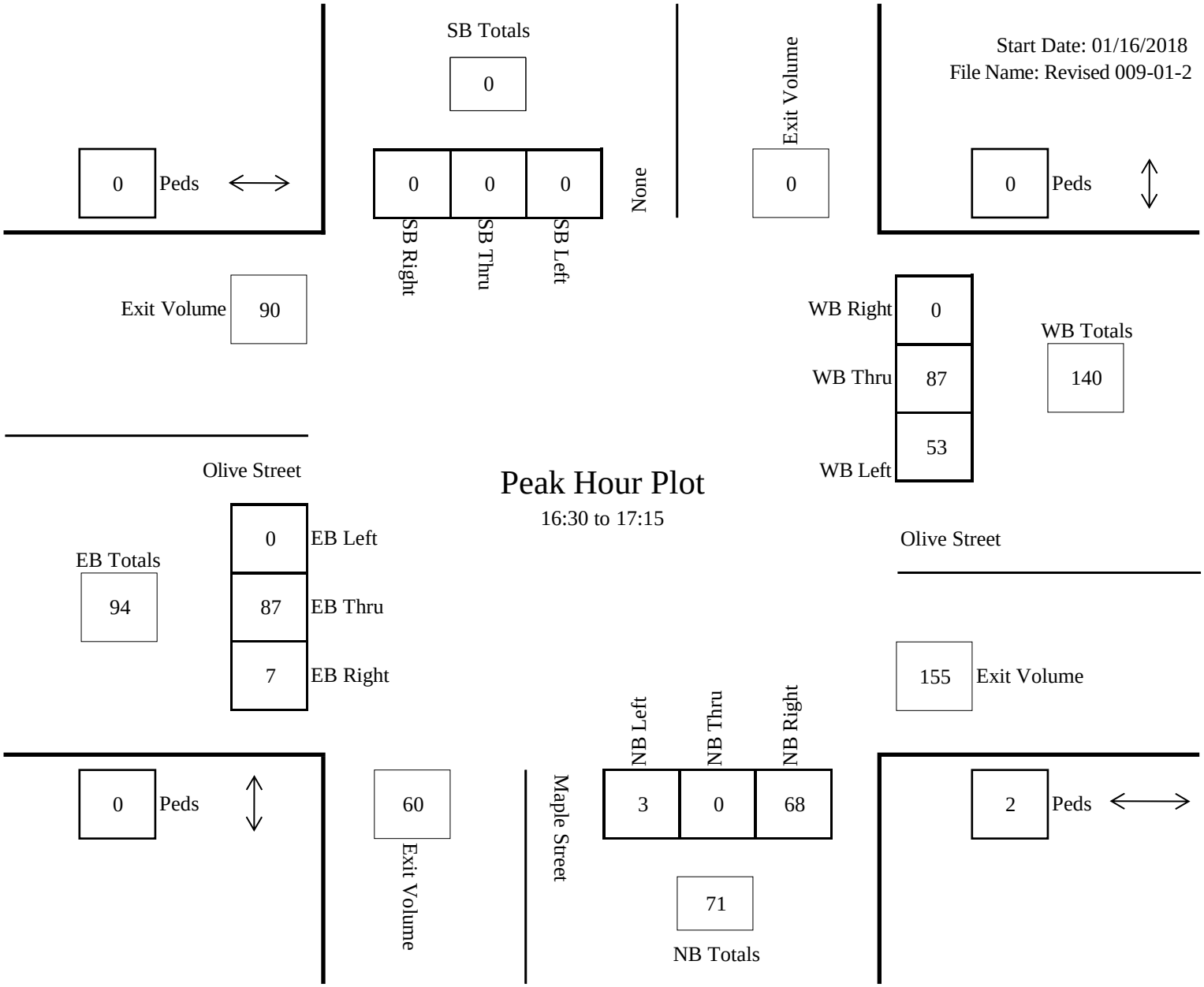

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BC 18-009 Start Date: 01/16/2018

Location: Pine Street & Olive Street File Name: 009-02-1

	Pine Street Southbound				Olive Street Westbound				Pine Street Northbound				Olive Street Eastbound				
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	13	6	14	0	3	83	3	1	2	12	38	0	6	89	1	0	271
7:15	11	6	11	1	4	72	5	0	1	7	29	0	7	93	0	0	247
7:30	6	0	13	0	3	62	3	1	3	9	21	0	6	69	0	0	196
7:45	9	4	7	0	6	73	6	1	3	11	34	0	5	75	0	0	234
Total	39	16	45	1	16	290	17	3	9	39	122	0	24	326	1	0	948
8:00	7	9	9	0	5	71	11	0	2	14	22	0	13	80	2	0	245
8:15	7	7	12	0	4	54	4	0	3	8	14	0	8	59	1	0	181
8:30	9	7	9	0	6	52	3	0	0	7	26	0	8	83	1	0	211
8:45	7	9	10	0	7	58	7	0	0	9	21	0	13	63	1	0	205
Total	30	32	40	0	22	235	25	0	5	38	83	0	42	285	5	0	842
Grand Total	69	48	85	1	38	525	42	3	14	77	205	0	66	611	6	0	1790
Approach%	34.0	23.6	41.9	0.5	6.3	86.3	6.9	0.5	4.7	26.0	69.3	-	9.7	89.5	0.9	-	
Total%	3.9	2.7	4.7	0.1	2.1	29.3	2.3	0.2	0.8	4.3	11.5	-	3.7	34.1	0.3	-	

Peak hour analysis for the period 07:00 to 07:45

Volume	39	16	45	1	16	290	17	3	9	39	122	-	24	326	1	-	948
Approach%	38.6	15.8	44.6	1.0	4.9	89.0	5.2	0.9	5.3	22.9	71.8	-	6.8	92.9	0.3	-	
Total%	4.1	1.7	4.7	0.1	1.7	30.6	1.8	0.3	0.9	4.1	12.9	-	2.5	34.4	0.1	-	
PHF				0.77				0.91				0.82				0.88	

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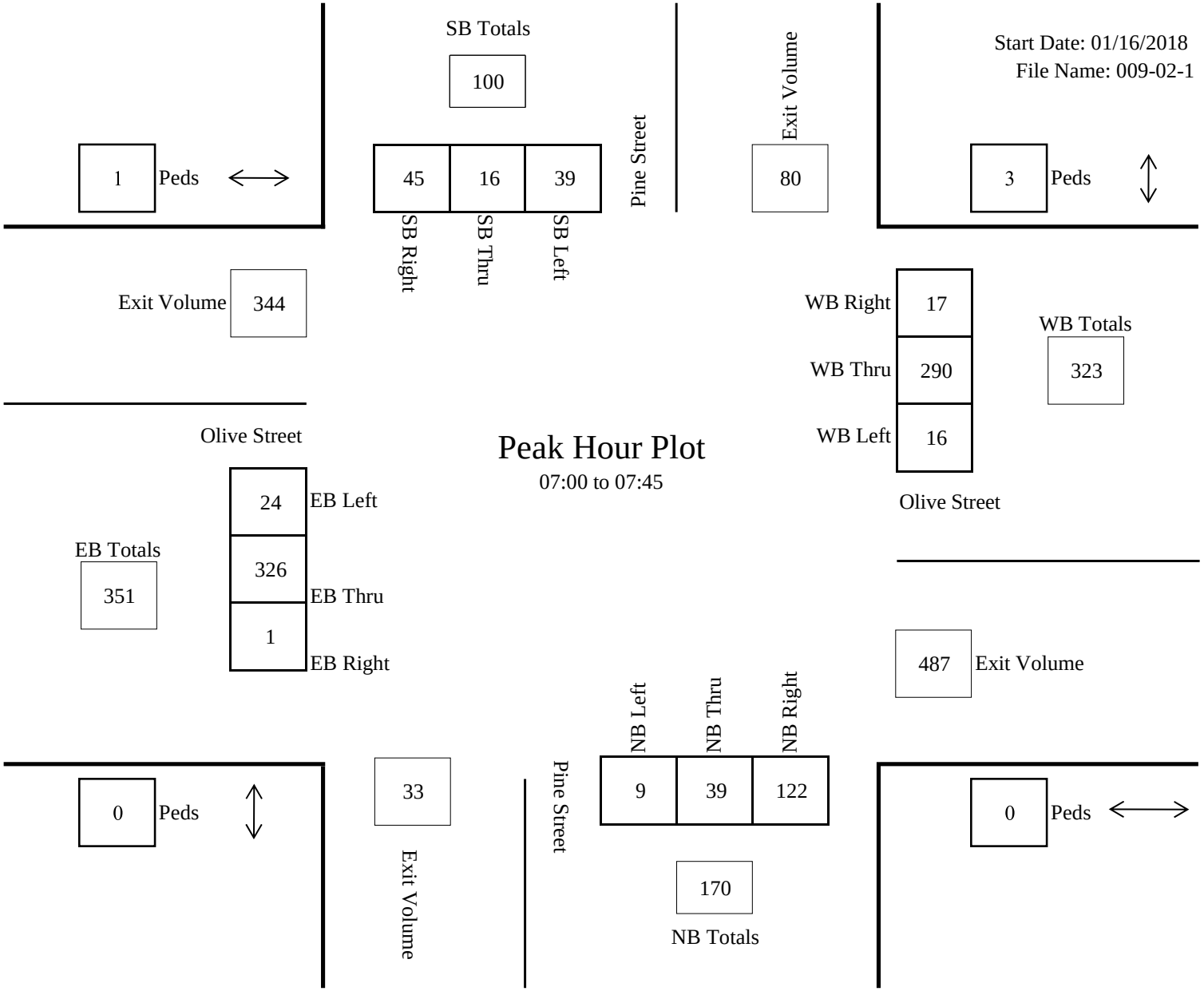
Start Date: 01/16/2018
File Name: 009-02-1



Chen Ryan Associates

3900 Fifth Avenue, Suite 210 | San Diego, CA 92103

BC 18-009 Start Date: 01/16/2018

Location: Pine Street & Olive Street File Name: 009-02-2

	Pine Street Southbound				Olive Street Westbound				Pine Street Northbound				Olive Street Eastbound				
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	10	68	4	0	11	21	12	1	12	100	10	0	1	10	17	0	277
7:15	18	74	4	0	7	10	15	0	14	120	13	0	2	10	13	0	300
7:30	17	83	1	0	12	12	19	0	20	112	10	0	5	10	13	0	314
7:45	3	73	0	0	9	8	13	1	12	130	9	0	2	6	12	0	278
Total	48	298	9	0	39	51	59	2	58	462	42	0	10	36	55	0	1169
8:00	10	86	3	0	13	11	20	0	28	124	14	0	0	13	8	0	330
8:15	21	50	5	0	7	15	25	0	14	112	10	0	3	13	9	0	284
8:30	5	74	5	0	8	14	10	0	9	107	14	0	5	6	7	0	264
8:45	7	50	2	0	9	5	12	0	5	64	9	0	3	9	6	0	181
Total	43	260	15	0	37	45	67	0	56	407	47	0	11	41	30	0	1059
Grand Total	91	558	24	0	76	96	126	2	114	869	89	0	21	77	85	0	2228
Approach%	13.5	82.9	3.6	-	25.3	32.0	42.0	0.7	10.6	81.1	8.3	-	11.5	42.1	46.4	-	
Total%	4.1	25.0	1.1	-	3.4	4.3	5.7	0.1	5.1	39.0	4.0	-	0.9	3.5	3.8	-	

Peak hour analysis for the period 07:15 to 08:00

Volume	48	316	8	-	41	41	67	1	74	486	46	-	9	39	46	-	1,222
Approach%	12.9	84.9	2.2	-	27.3	27.3	44.7	0.7	12.2	80.2	7.6	-	9.6	41.5	48.9	-	
Total%	3.9	25.9	0.7	-	3.4	3.4	5.5	0.1	6.1	39.8	3.8	-	0.7	3.2	3.8	-	
PHF				0.92				0.85				0.91				0.84	

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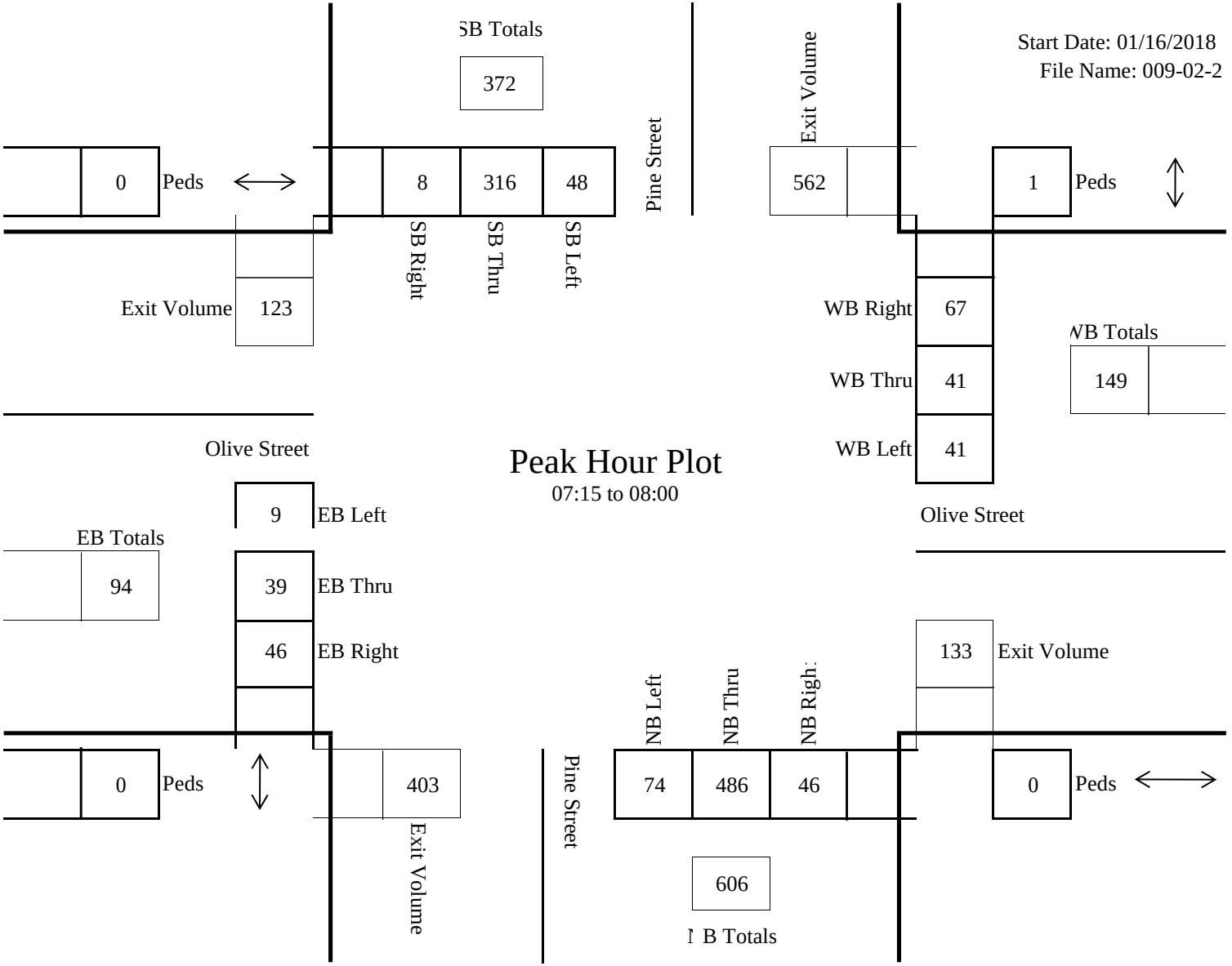
3900 Fifth Avenue, Suite 210 | San Diego, CA 92103

Start Date: 01/16/2018
File Name: 009-02-2

Peak Hour Plot

07:15 to 08:00



Chen Ryan Associates

3900 Fifth Avenue, Suite 210 | San Diego, CA 92103

BC 18-009 Start Date: 01/16/2018

Locaion: Maple Street/13th Street/Walnut Street File Name: 009-03-1

	Maple Street Southbound				Walnut Street Westbound				13th Street Northbound				Olive Street Eastbound				
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	0	3	7	0	1	0	1	0	4	6	0	0	3	0	2	0	27
7:15	0	10	6	0	0	0	0	0	2	12	1	0	5	0	3	1	40
7:30	1	6	7	0	0	0	0	0	4	8	1	0	7	0	3	0	37
7:45	0	4	5	0	0	1	0	0	0	1	1	0	3	0	2	0	17
Total	1	23	25	0	1	1	1	0	10	27	3	0	18	0	10	1	121
8:00	1	12	2	0	0	0	0	0	1	6	0	0	0	0	0	0	22
8:15	1	8	5	0	0	0	0	0	1	6	0	0	6	0	1	0	28
8:30	0	6	1	0	0	0	0	0	2	5	0	0	3	0	1	0	18
8:45	1	2	3	0	0	0	0	0	0	3	0	0	0	0	0	0	9
Total	3	28	11	0	0	0	0	0	4	20	0	0	9	0	2	0	77
Grand Total	4	51	36	0	1	1	1	0	14	47	3	0	27	0	12	1	198
Approach%	4.4	56.0	39.6	-	33.3	33.3	33.3	-	21.9	73.4	4.7	-	67.5	-	30.0	2.5	
Total%	2.0	25.8	18.2	-	0.5	0.5	0.5	-	7.1	23.7	1.5	-	13.6	-	6.1	0.5	

Peak hour analysis for the period 07:00 to 07:45

Volume	1	23	25	-	1	1	1	-	10	27	3	-	18	-	10	1	121
Approach%	2.0	46.9	51.0	-	33.3	33.3	33.3	-	25.0	67.5	7.5	-	62.1	-	34.5	3.4	
Total%	0.8	19.0	20.7	-	0.8	0.8	0.8	-	8.3	22.3	2.5	-	14.9	-	8.3	0.8	
PHF				0.77				0.38				0.67				0.73	

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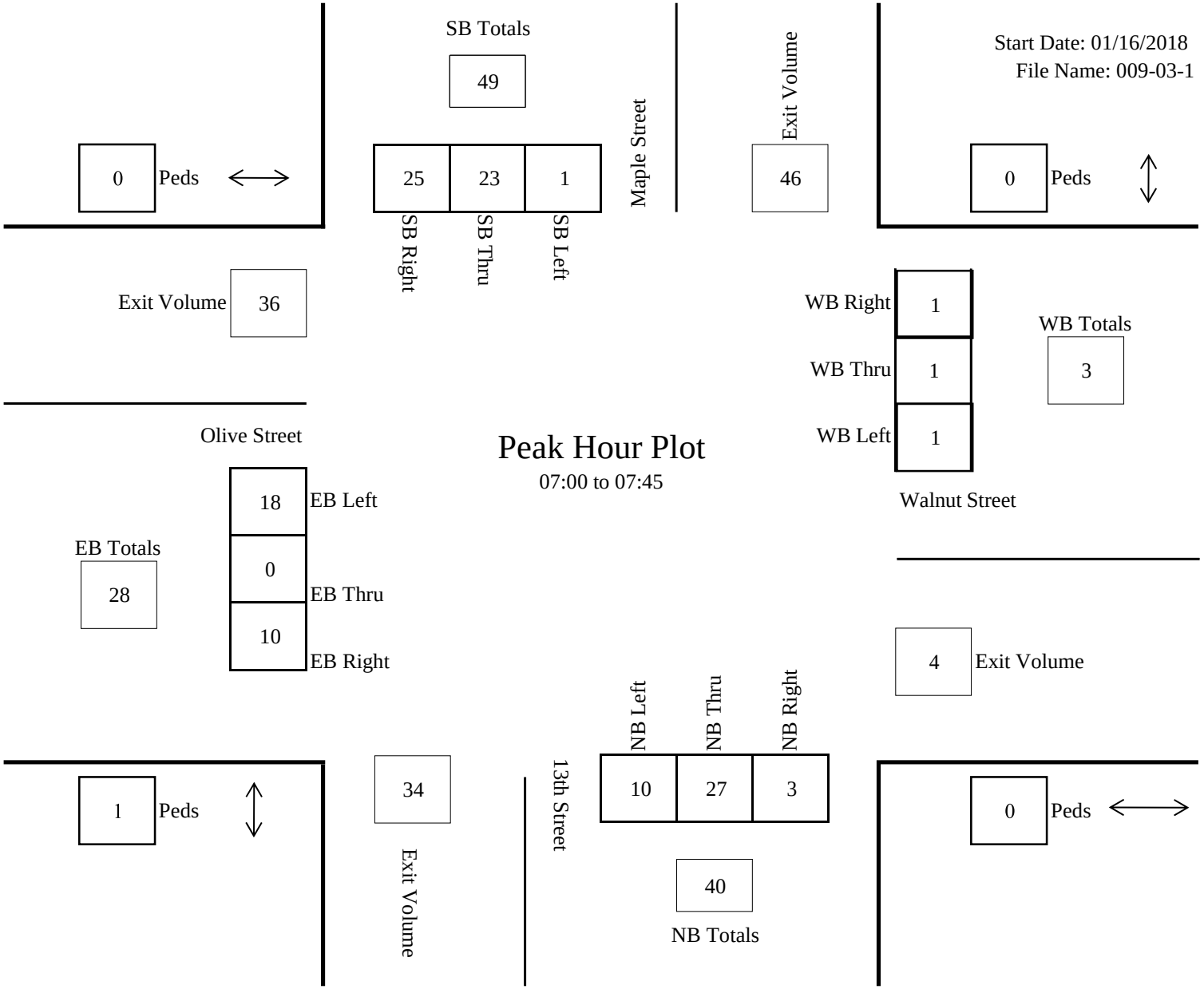
Start Date: 01/16/2018
File Name: 009-03-1



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3900 Fifth Avenue, Suite 210 | San Diego, CA 92103

BC 18-009 Start Date: 01/16/2018

Locaion: Maple Street/13th Street/Walnut Street File Name: 009-03-2

	Maple Street Southbound				Walnut Street Westbound				13th Street Northbound				Olive Street Eastbound				
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	2	1	1	0	1	0	0	0	0	3	0	0	0	0	0	0	8
16:15	0	4	0	0	0	0	1	0	1	3	0	0	4	0	0	0	13
16:30	0	4	0	0	0	0	2	0	1	5	0	0	2	0	0	0	14
16:45	1	1	0	0	0	0	0	0	0	6	0	0	6	0	2	0	16
Total	3	10	1	0	1	0	3	0	2	17	0	0	12	0	2	0	51
17:00	0	3	0	0	0	0	0	0	0	5	1	0	3	0	1	0	13
17:15	1	4	1	0	0	0	0	1	0	3	0	0	1	0	0	0	11
17:30	1	1	3	0	1	0	1	2	2	6	0	0	3	0	0	0	20
17:45	0	2	4	0	1	0	0	0	0	2	0	0	3	0	0	0	12
Total	2	10	8	0	2	0	1	3	2	16	1	0	10	0	1	0	56
Grand Total	5	20	9	0	3	0	4	3	4	33	1	0	22	0	3	0	107
Approach%	14.7	58.8	26.5	-	30.0	-	40.0	30.0	10.5	86.8	2.6	-	88.0	-	12.0	-	
Total%	4.7	18.7	8.4	-	2.8	-	3.7	2.8	3.7	30.8	0.9	-	20.6	-	2.8	-	

Peak hour analysis for the period 16:45 to 17:30

Volume	3	9	4	-	1	-	1	3	2	20	1	-	13	-	3	-	60
Approach%	18.8	56.3	25.0	-	20.0	-	20.0	60.0	8.7	87.0	4.3	-	81.3	-	18.8	-	
Total%	5.0	15.0	6.7	-	1.7	-	1.7	5.0	3.3	33.3	1.7	-	21.7	-	5.0	-	
PHF				0.67				0.31				0.72				0.50	

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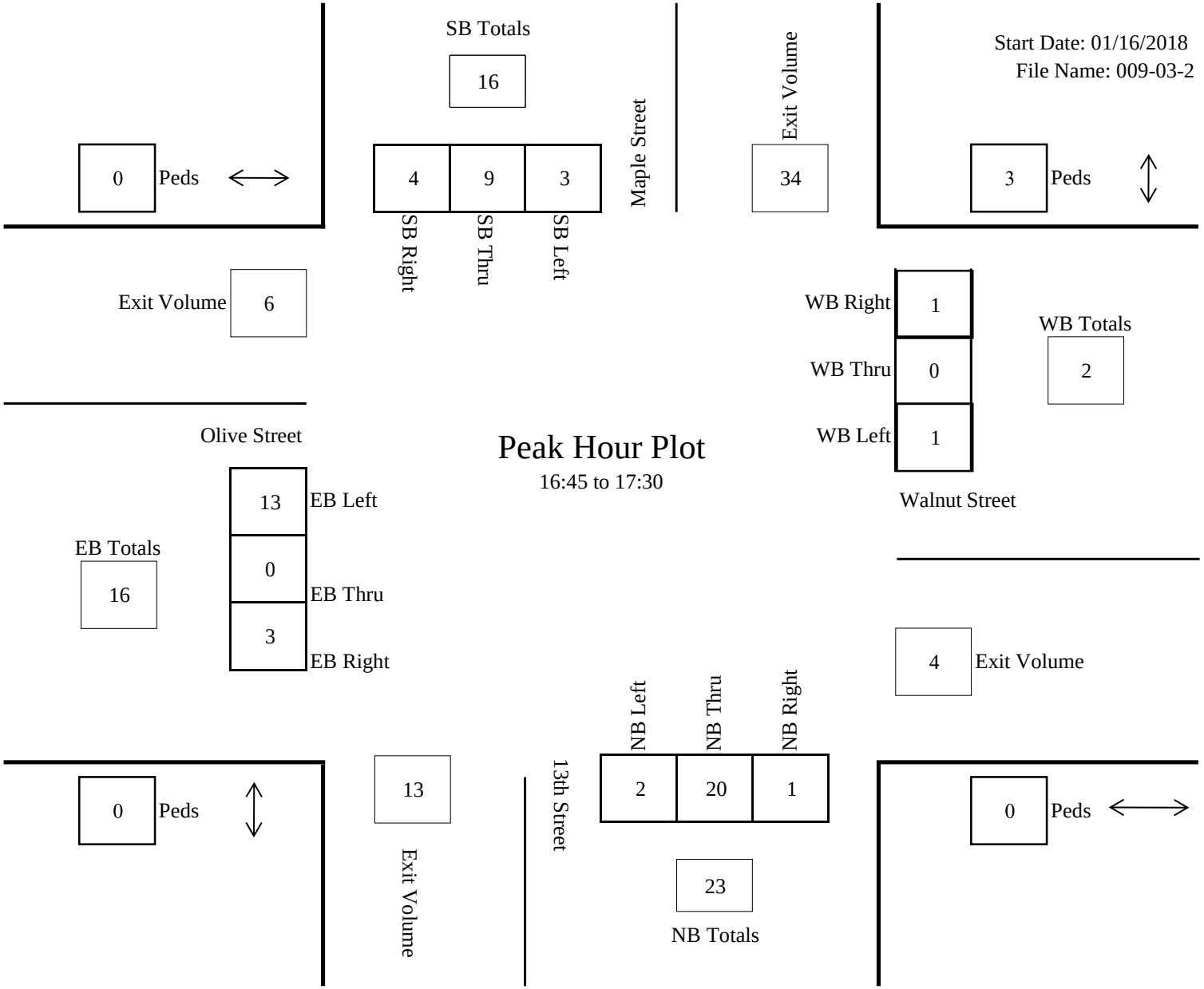

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3900 Fifth Avenue, Suite 210 | San Diego, CA 92103

BC 18-009 Start Date: 01/16/2018

Location: 10th Street (SR 78) / Main Street (SR 67) File Name: 009-05-1

	10th Street (SR 78) Southbound				Main Street (SR 67) Westbound				10th Street (SR 78) Northbound				Main Street (SR 67) Eastbound				
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	16	34	30	0	20	131	7	0	31	53	23	0	27	72	17	1	462
7:15	15	28	27	0	13	118	12	0	36	44	24	0	41	85	8	0	451
7:30	18	40	28	0	13	92	9	0	35	32	15	3	37	92	11	0	425
7:45	15	22	36	1	7	198	13	0	23	31	12	1	34	145	8	0	546
Total	64	124	121	1	53	539	41	0	125	160	74	4	139	394	44	1	1884
8:00	23	22	34	2	10	137	13	1	35	34	22	1	38	104	8	0	484
8:15	18	15	46	1	11	144	3	0	39	39	17	1	30	120	12	1	497
8:30	13	19	28	1	4	141	13	0	36	36	17	2	42	101	18	1	472
8:45	6	12	36	0	8	133	12	0	39	39	11	0	34	96	10	0	436
Total	60	68	144	4	33	555	41	1	149	148	67	4	144	421	48	2	1889
Grand Total	124	192	265	5	86	1094	82	1	274	308	141	8	283	815	92	3	3773
Approach%	21.2	32.8	45.2	0.9	6.8	86.6	6.5	0.1	37.5	42.1	19.3	1.1	23.7	68.3	7.7	0.3	
Total%	3.3	5.1	7.0	0.1	2.3	29.0	2.2	0.0	7.3	8.2	3.7	0.2	7.5	21.6	2.4	0.1	

Peak hour analysis for the period 07:45 to 08:30

Volume	69	78	144	5	32	620	42	1	133	140	68	5	144	470	46	2	1,999
Approach%	23.3	26.4	48.6	1.7	4.6	89.2	6.0	0.1	38.4	40.5	19.7	1.4	21.8	71.0	6.9	0.3	
Total%	3.5	3.9	7.2	0.3	1.6	31.0	2.1	0.1	6.7	7.0	3.4	0.3	7.2	23.5	2.3	0.1	
PHF				0.91				0.80				0.90				0.89	

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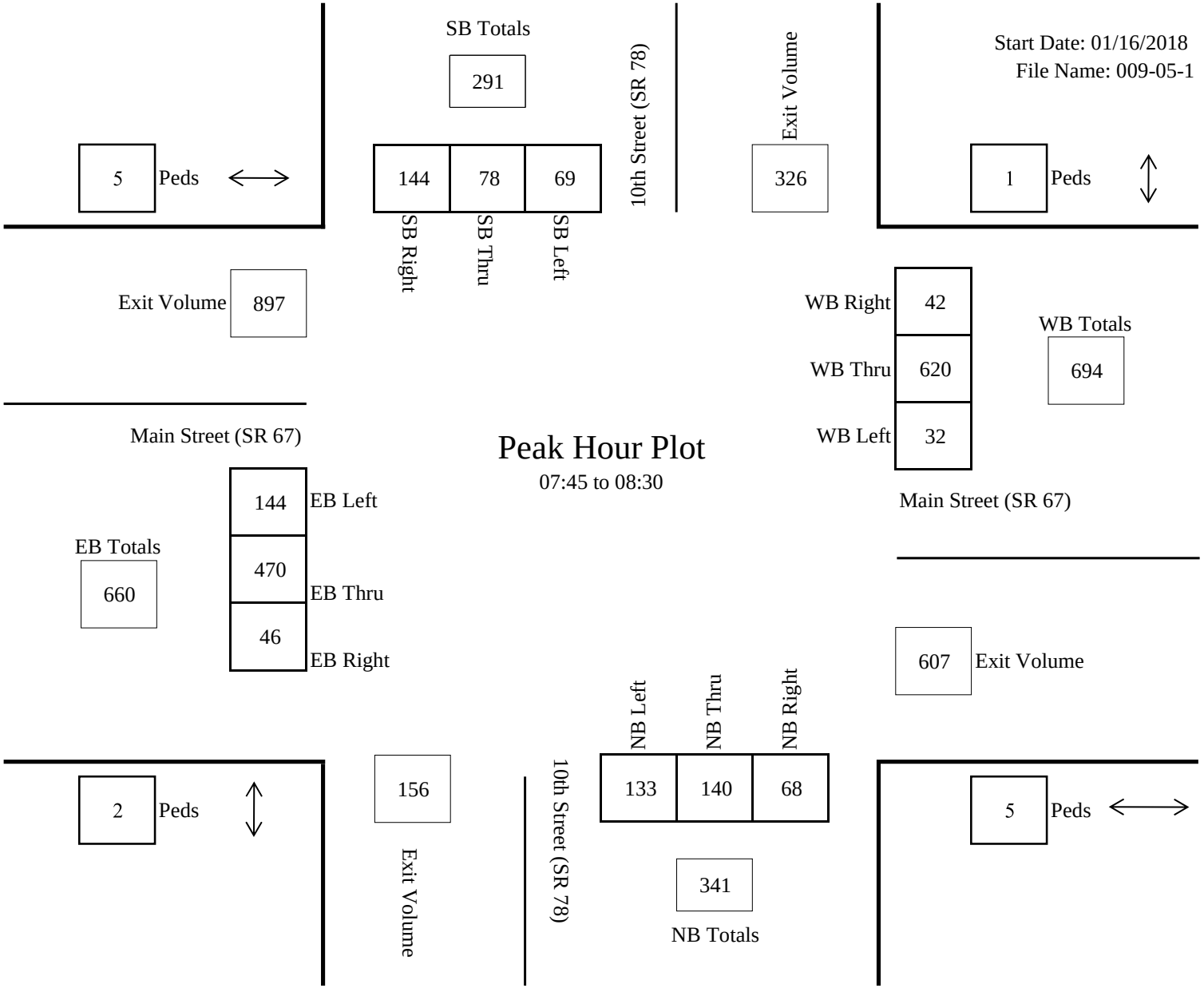
Start Date: 01/16/2018
File Name: 009-05-1



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3900 Fifth Avenue, Suite 210 | San Diego, CA 92103

BC 18-009 Start Date: 01/16/2018

Location: 10th Street (SR 78) / Main Street (SR 67) File Name: 009-05-2

	10th Street (SR 78) Southbound				Main Street (SR 67) Westbound				10th Street (SR 78) Northbound				Main Street (SR 67) Eastbound				
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	19	30	47	1	21	149	15	0	30	32	14	3	39	215	21	0	636
16:15	19	43	52	1	7	147	9	0	35	39	18	0	53	207	16	1	647
16:30	29	68	48	0	16	117	11	0	36	33	12	0	43	177	15	1	606
16:45	27	45	49	1	17	137	10	0	29	37	12	2	36	171	20	4	597
Total	94	186	196	3	61	550	45	0	130	141	56	5	171	770	72	6	2486
17:00	35	61	45	0	20	164	17	0	29	39	10	2	42	219	19	4	706
17:15	20	45	65	1	14	130	10	0	33	35	14	1	69	202	13	1	653
17:30	25	51	51	0	11	107	14	0	24	43	13	1	36	173	7	3	559
17:45	15	30	28	0	18	124	8	0	25	21	9	1	41	169	24	4	517
Total	95	187	189	1	63	525	49	0	111	138	46	5	188	763	63	12	2435
Grand Total	189	373	385	4	124	1075	94	0	241	279	102	10	359	1533	135	18	4921
Approach%	19.9	39.2	40.5	0.4	9.6	83.1	7.3	-	38.1	44.1	16.1	1.6	17.6	75.0	6.6	0.9	
Total%	3.8	7.6	7.8	0.1	2.5	21.8	1.9	-	4.9	5.7	2.1	0.2	7.3	31.2	2.7	0.4	

Peak hour analysis for the period 16:30 to 17:15

Volume	111	219	207	2	67	548	48	-	127	144	48	5	190	769	67	10	2,562
Approach%	20.6	40.6	38.4	0.4	10.1	82.7	7.2	-	39.2	44.4	14.8	1.5	18.3	74.2	6.5	1.0	
Total%	4.3	8.5	8.1	0.1	2.6	21.4	1.9	-	5.0	5.6	1.9	0.2	7.4	30.0	2.6	0.4	
PHF				0.93				0.82				0.98				0.91	

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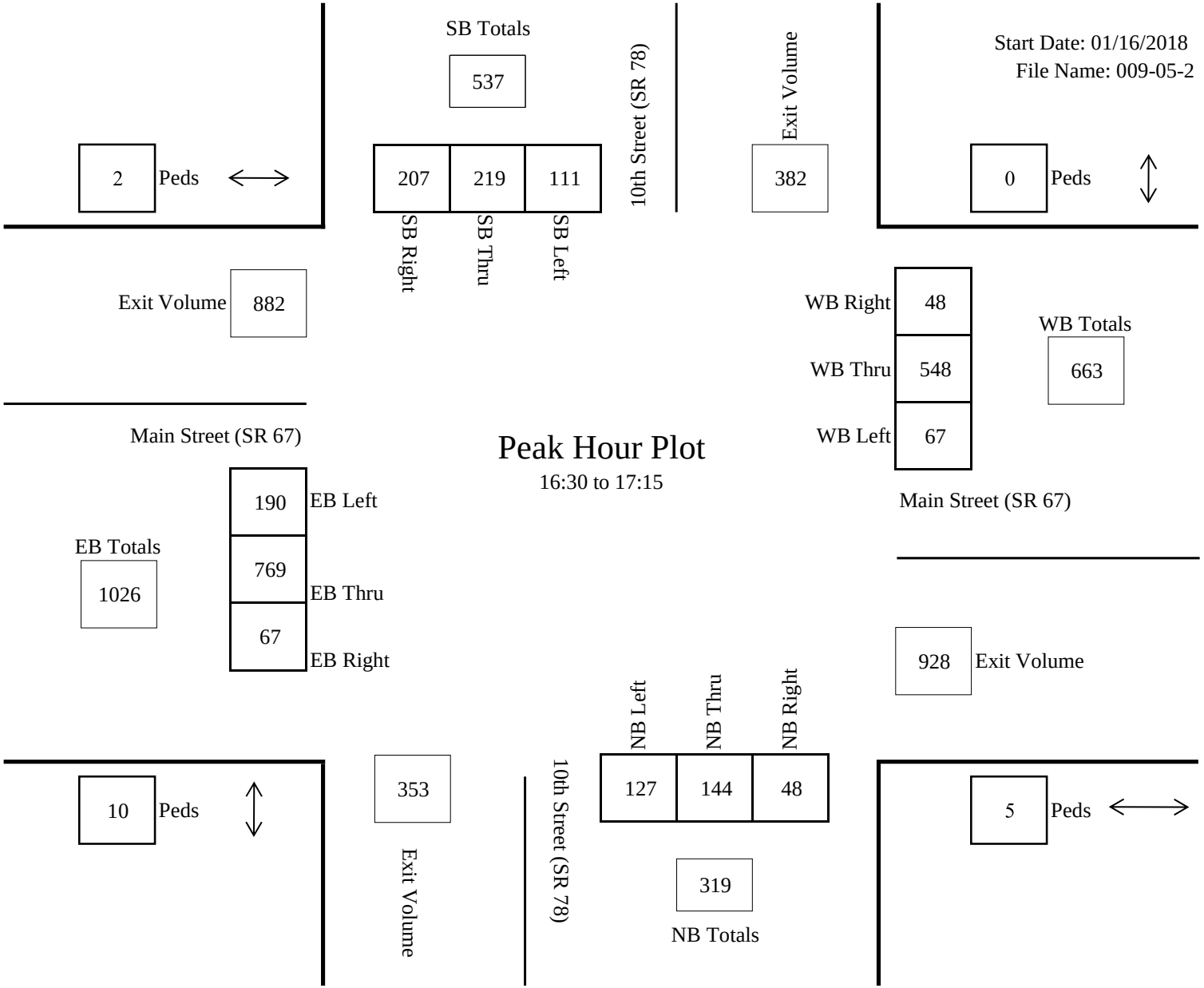

Chen Ryan Associates

3900 Fifth Avenue, Suite 210 | San Diego, CA 92103

BC 18-009 Ramona
Location: 13th Street & Main Street (SR-67)

Start Date: 01/16/2018
File Name: Revised 009-04-1

	13th Street Southbound				Main Street (SR-67) Westbound				13th Street Northbound				Main Street (SR-67) Eastbound				
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
7:00	0	0	0	0	3	139	1	0	0	0	3	2	4	196	1	0	349
7:15	0	0	4	1	8	130	0	0	0	0	5	0	3	169	4	0	324
7:30	0	0	3	0	9	152	0	0	0	0	6	0	4	167	6	0	347
7:45	0	0	1	1	7	174	3	0	0	0	3	1	7	235	12	0	444
Total	0	0	8	2	27	595	4	0	0	0	17	3	18	767	23	0	1464
8:00	0	0	5	2	5	169	0	0	0	0	6	1	3	210	3	0	404
8:15	0	0	4	1	8	181	2	0	0	0	8	0	2	212	8	0	426
8:30	0	0	0	0	5	148	3	0	0	0	7	2	1	194	4	0	364
8:45	0	0	3	0	9	153	3	0	0	0	5	1	2	214	5	0	395
Total	0	0	12	3	27	651	8	0	0	0	26	4	8	830	20	0	1589
Grand Total	0	0	20	5	54	1246	12	0	0	0	43	7	26	1597	43	0	3053
Approach%	-	-	80.0	20.0	4.1	95.0	0.9	-	-	-	86.0	14.0	1.6	95.9	2.6	-	
Total%	-	-	0.7	0.2	1.8	40.8	0.4	-	-	-	1.4	0.2	0.9	52.3	1.4	-	

Peak hour analysis for the period 07:45 to 08:30

Volume	-	-	10	4	25	672	8	-	-	-	24	4	13	851	27	-	1,638
Approach%	-	-	71.4	28.6	3.5	95.3	1.1	-	-	-	85.7	14.3	1.5	95.5	3.0	-	
Total%	-	-	0.6	0.2	1.5	41.0	0.5	-	-	-	1.5	0.2	0.8	52.0	1.6	-	
PHF				0.50				0.92				0.78				0.88	

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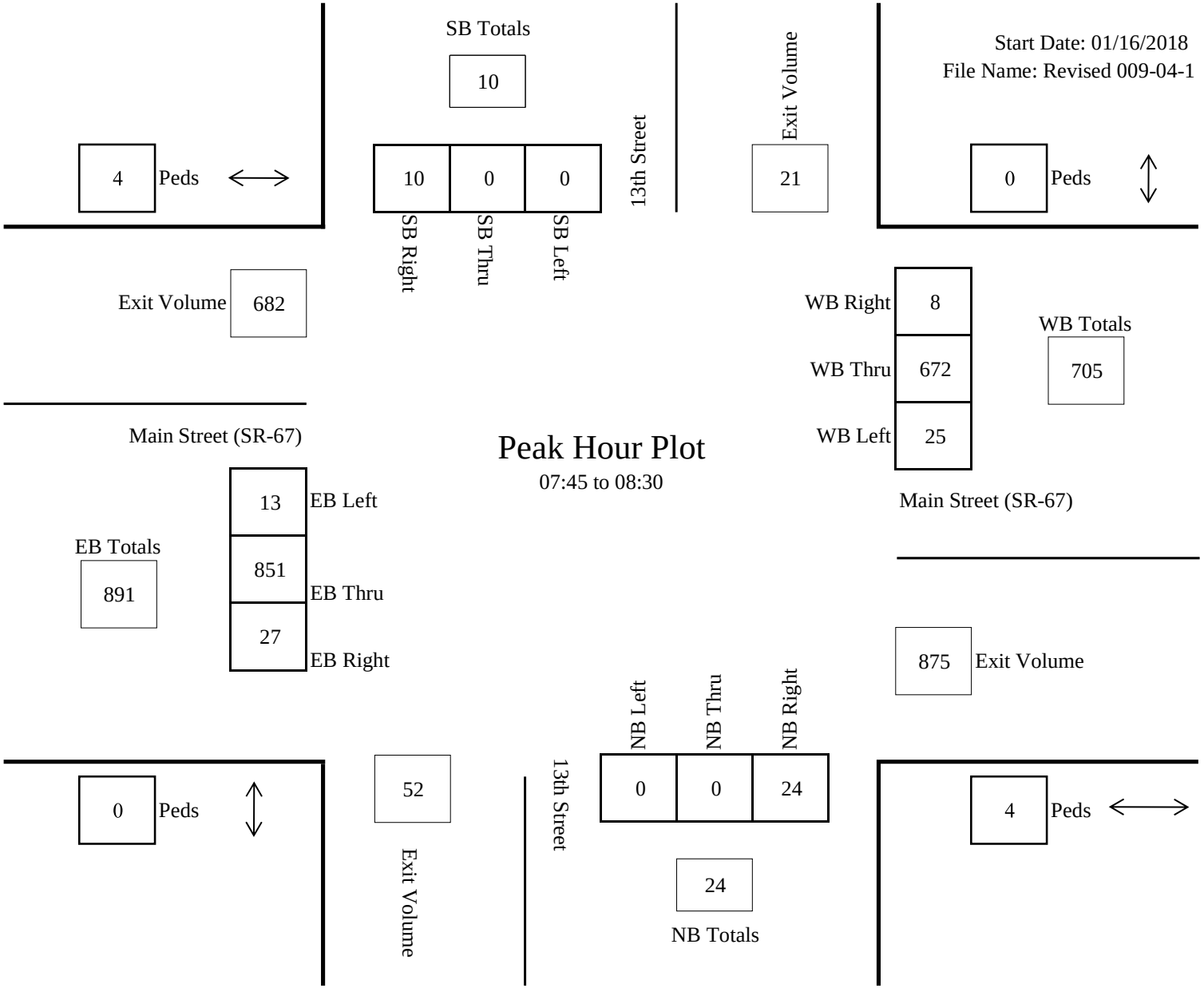

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3900 Fifth Avenue, Suite 210 | San Diego, CA 92103

BC 18-009 Ramona
Location: 13th Street & Main Street (SR-67)

Start Date: 01/16/2018
File Name: Revised 009-04-2

	13th Street Southbound				Main Street (SR-67) Westbound				13th Street Northbound				Main Street (SR-67) Eastbound				
Start Time	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Interval Total
16:00	0	0	11	0	24	286	3	0	0	0	16	2	8	214	8	0	572
16:15	0	0	5	0	16	294	0	0	0	0	16	3	15	203	7	0	559
16:30	0	0	7	0	10	255	6	0	0	0	21	2	7	209	11	0	528
16:45	0	0	12	0	15	259	3	0	0	0	19	3	10	195	12	0	528
Total	0	0	35	0	65	1094	12	0	0	0	72	10	40	821	38	0	2187
17:00	0	0	9	0	11	262	2	0	0	0	12	4	4	222	5	0	531
17:15	0	0	6	0	11	263	2	0	0	0	17	1	8	194	5	0	507
17:30	0	0	13	0	6	249	5	0	0	0	16	0	3	178	4	0	474
17:45	0	0	8	0	5	247	2	0	0	0	16	0	7	155	4	0	444
Total	0	0	36	0	33	1021	11	0	0	0	61	5	22	749	18	0	1956
Grand Total	0	0	71	0	98	2115	23	0	0	0	133	15	62	1570	56	0	4143
Approach%	-	-	100.0	-	4.4	94.6	1.0	-	-	-	89.9	10.1	3.7	93.0	3.3	-	
Total%	-	-	1.7	-	2.4	51.0	0.6	-	-	-	3.2	0.4	1.5	37.9	1.4	-	

Peak hour analysis for the period 16:00 to 16:45

Volume	-	-	35	-	65	1,094	12	-	-	-	72	10	40	821	38	-	2,187
Approach%	-	-	100.0	-	5.6	93.4	1.0	-	-	-	87.8	12.2	4.4	91.3	4.2	-	
Total%	-	-	1.6	-	3.0	50.0	0.5	-	-	-	3.3	0.5	1.8	37.5	1.7	-	
PHF				0.73				0.94				0.89				0.98	

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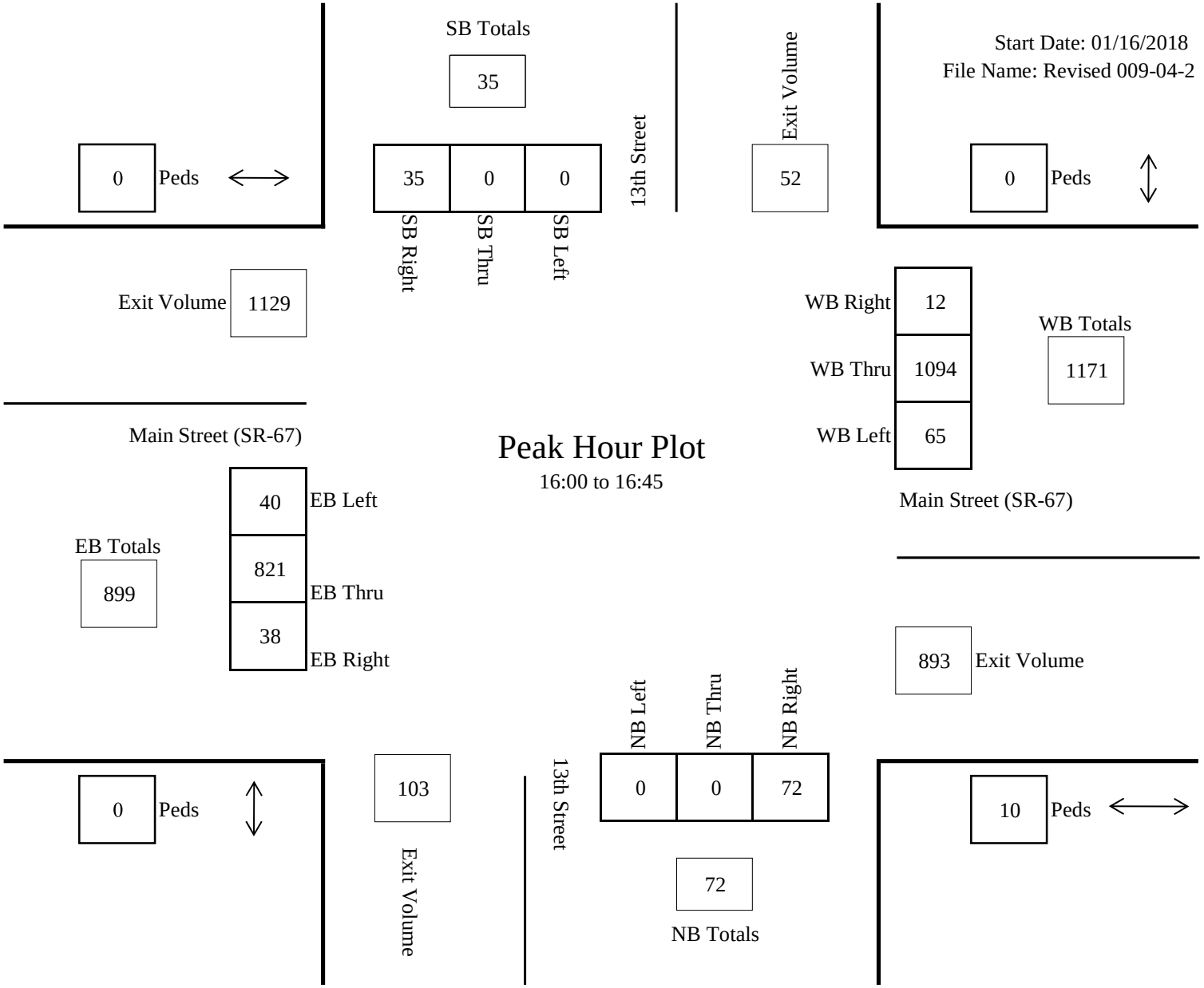
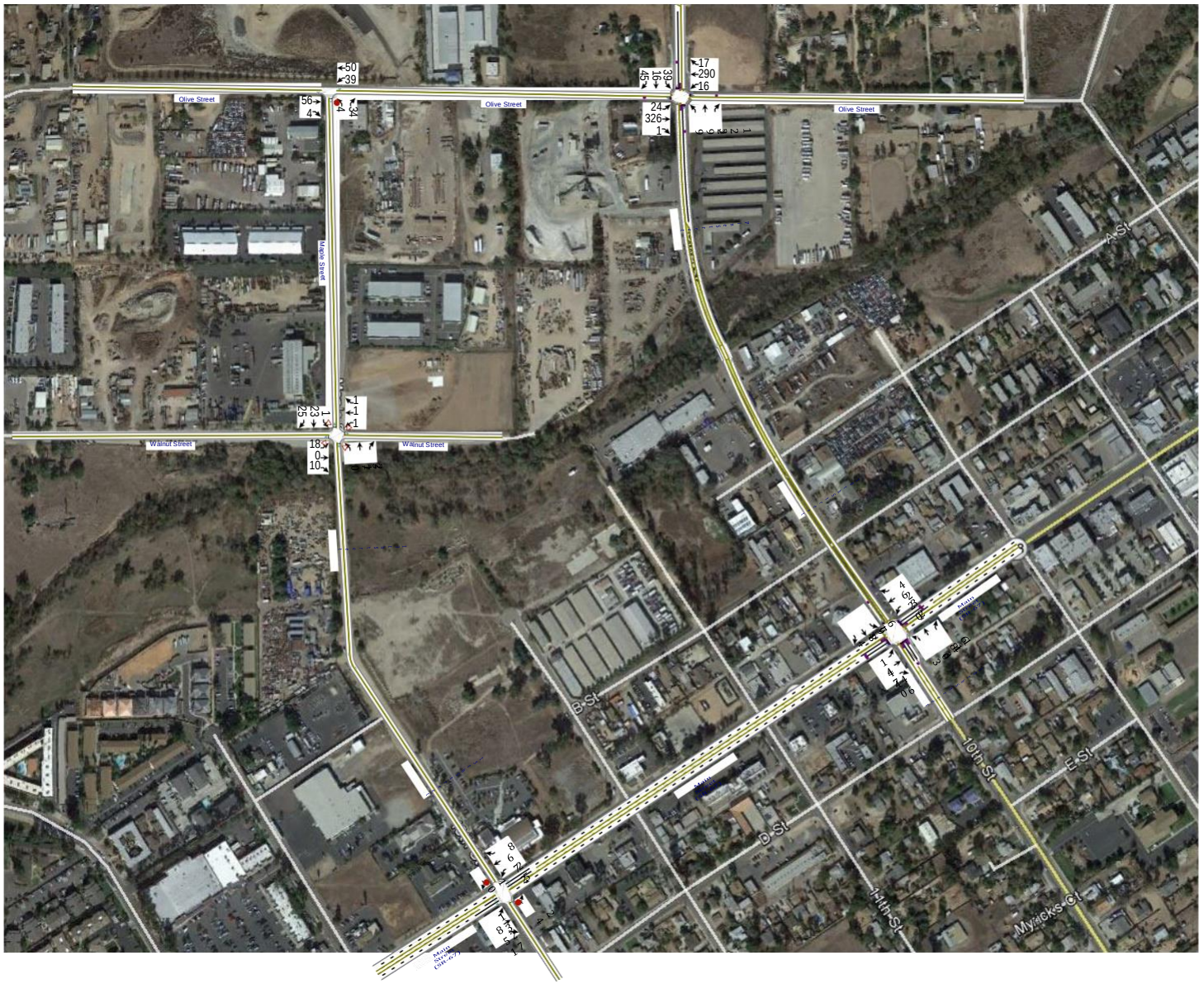


Attachment B
Existing Conditions Synchro Worksheets

Map - Existing AM
Volumes

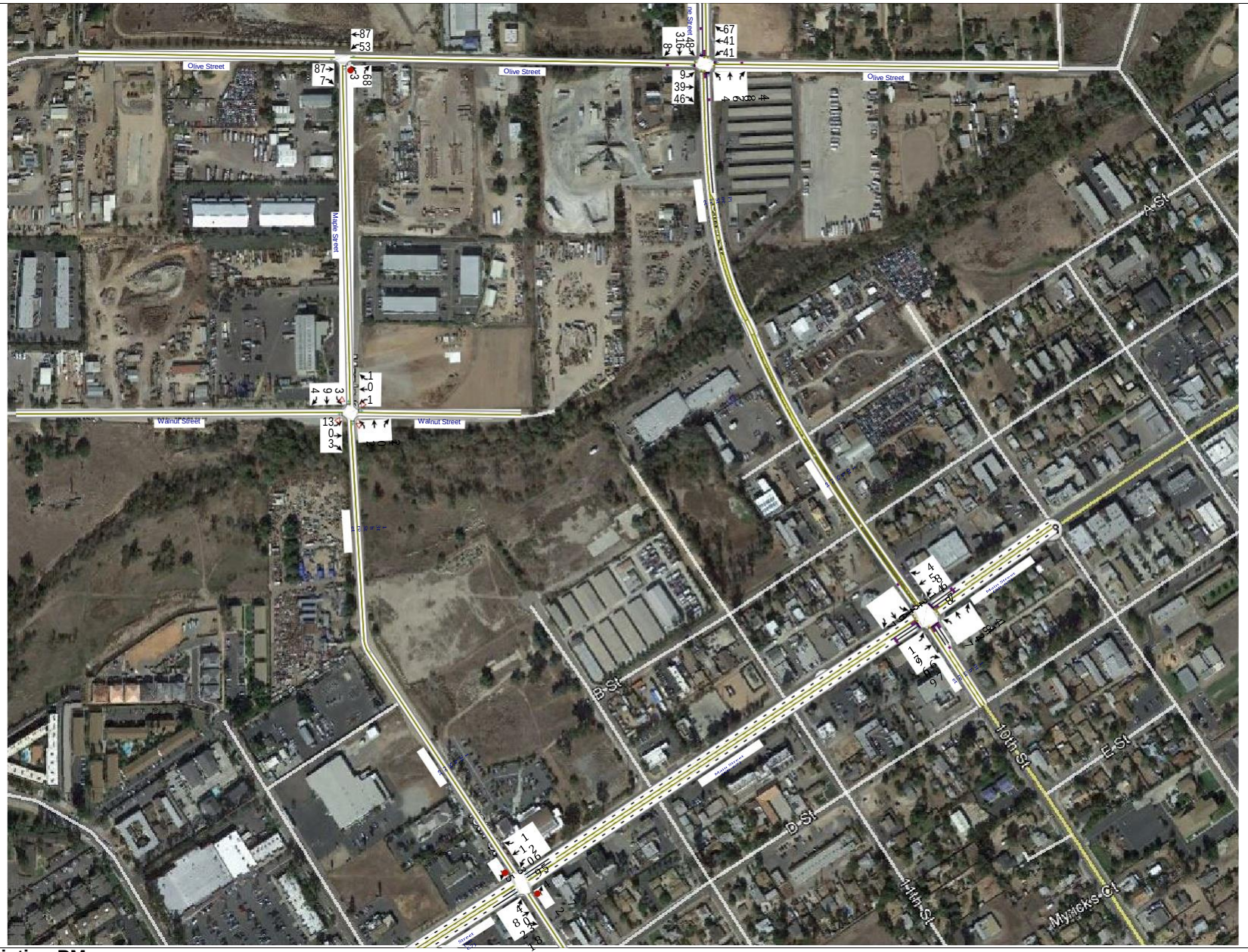
10/26/2018



Existing AM
Existing AM.syn

Map - Existing PM
Volumes

10/26/2018



Existing PM
Existing PM.syn

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	56	4	39	50	4	34
Future Volume (Veh/h)	56	4	39	50	4	34
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.72	0.72	0.79	0.79
Hourly flow rate (vph)	64	5	54	69	5	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				1272		
pX, platoon unblocked						
vC, conflicting volume			69		244	66
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			69		244	66
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		99	96
cM capacity (veh/h)			1532		719	997

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	69	123	48
Volume Left	0	54	5
Volume Right	5	0	43
cSH	1700	1532	958
Volume to Capacity	0.04	0.04	0.05
Queue Length 95th (ft)	0	3	4
Control Delay (s)	0.0	3.4	9.0
Lane LOS		A	A
Approach Delay (s)	0.0	3.4	9.0
Approach LOS			A

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	21.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	326	1	16	290	17	9	39	122	39	16	45
Future Volume (vph)	24	326	1	16	290	17	9	39	122	39	16	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.8			6.8		4.7	7.5		4.7	7.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		1.00			0.99		1.00	0.89		1.00	0.89	
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1856			1845		1770	1651		1770	1658	
Flt Permitted		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1856			1845		1770	1651		1770	1658	
Peak-hour factor, PHF	0.88	0.88	0.88	0.91	0.91	0.91	0.82	0.82	0.82	0.77	0.77	0.77
Adj. Flow (vph)	27	370	1	18	319	19	11	48	149	51	21	58
RTOR Reduction (vph)	0	0	0	0	2	0	0	110	0	0	46	0
Lane Group Flow (vph)	0	398	0	0	354	0	11	87	0	51	33	0
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		20.9			21.9		1.3	15.6		4.6	18.9	
Effective Green, g (s)		20.9			21.9		1.3	15.6		4.6	18.9	
Actuated g/C Ratio		0.24			0.25		0.01	0.18		0.05	0.21	
Clearance Time (s)		6.8			6.8		4.7	7.5		4.7	7.5	
Vehicle Extension (s)		3.0			3.0		3.0	7.0		3.0	7.0	
Lane Grp Cap (vph)		436			455		25	290		91	352	
v/s Ratio Prot		c0.21			c0.19		0.01	c0.05		c0.03	c0.02	
v/s Ratio Perm												
v/c Ratio		0.91			0.78		0.44	0.30		0.56	0.09	
Uniform Delay, d1		33.1			31.2		43.4	31.9		41.1	28.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		23.2			8.2		11.9	2.1		7.7	0.4	
Delay (s)		56.3			39.4		55.3	33.9		48.8	28.5	
Level of Service		E			D		E	C		D	C	
Approach Delay (s)		56.3			39.4			35.1			36.5	
Approach LOS		E			D			D			D	

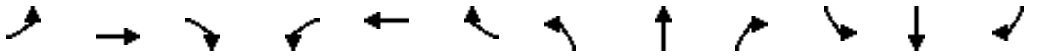
Intersection Summary			
HCM 2000 Control Delay	44.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	88.8	Sum of lost time (s)	25.8
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Yield			Yield			Yield			Yield	
Traffic Volume (vph)	18	0	10	1	1	1	10	27	3	1	23	25
Future Volume (vph)	18	0	10	1	1	1	10	27	3	1	23	25
Peak Hour Factor	0.73	0.73	0.73	0.38	0.38	0.38	0.67	0.67	0.67	0.77	0.77	0.77
Hourly flow rate (vph)	25	0	14	3	3	3	15	40	4	1	30	32

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	39	9	59	63
Volume Left (vph)	25	3	15	1
Volume Right (vph)	14	3	4	32
Hadj (s)	-0.05	-0.10	0.04	-0.27
Departure Headway (s)	4.1	4.1	4.1	3.8
Degree Utilization, x	0.04	0.01	0.07	0.07
Capacity (veh/h)	846	848	854	930
Control Delay (s)	7.3	7.1	7.4	7.1
Approach Delay (s)	7.3	7.1	7.4	7.1
Approach LOS	A	A	A	A

Intersection Summary				
Delay	7.2			
Level of Service	A			
Intersection Capacity Utilization	17.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	851	27	25	672	8	0	0	24	0	0	10
Future Volume (Veh/h)	13	851	27	25	672	8	0	0	24	0	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.92	0.92	0.92	0.78	0.78	0.78	0.50	0.50	0.50
Hourly flow rate (vph)	15	967	31	27	730	9	0	0	31	0	0	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	739			998			1452	1806	499	1333	1816	370
vC1, stage 1 conf vol							1012	1012		788	788	
vC2, stage 2 conf vol							439	793		544	1028	
vCu, unblocked vol	739			998			1452	1806	499	1333	1816	370
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			96			100	100	94	100	100	97
cM capacity (veh/h)	863			689			230	242	517	275	229	628

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	15	645	353	27	487	252	31	20
Volume Left	15	0	0	27	0	0	0	0
Volume Right	0	0	31	0	0	9	31	20
cSH	863	1700	1700	689	1700	1700	517	628
Volume to Capacity	0.02	0.38	0.21	0.04	0.29	0.15	0.06	0.03
Queue Length 95th (ft)	1	0	0	3	0	0	5	2
Control Delay (s)	9.2	0.0	0.0	10.4	0.0	0.0	12.4	10.9
Lane LOS	A			B			B	B
Approach Delay (s)	0.1			0.4			12.4	10.9
Approach LOS							B	B

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	34.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	144	470	46	32	620	42	133	140	68	69	78	144
Future Volume (vph)	144	470	46	32	620	42	133	140	68	69	78	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	4.7		4.7	4.7		5.4	5.4	5.4		5.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00		1.00	
Frt	1.00	0.99		1.00	0.99		1.00	1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)	1770	3492		1770	3505		1770	1863	1583		1718	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)	1770	3492		1770	3505		1770	1863	1583		1718	
Peak-hour factor, PHF	0.89	0.89	0.89	0.80	0.80	0.80	0.90	0.90	0.90	0.91	0.91	0.91
Adj. Flow (vph)	162	528	52	40	775	52	148	156	76	76	86	158
RTOR Reduction (vph)	0	4	0	0	3	0	0	0	66	0	21	0
Lane Group Flow (vph)	162	576	0	40	825	0	148	156	10	0	299	0
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	15.6	47.2		6.3	37.9		15.8	15.8	15.8		28.3	
Effective Green, g (s)	15.6	47.2		6.3	37.9		15.8	15.8	15.8		28.3	
Actuated g/C Ratio	0.13	0.40		0.05	0.32		0.13	0.13	0.13		0.24	
Clearance Time (s)	4.7	4.7		4.7	4.7		5.4	5.4	5.4		5.4	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		3.0	3.0	3.0		6.0	
Lane Grp Cap (vph)	234	1399		94	1127		237	249	212		412	
v/s Ratio Prot	c0.09	0.17		0.02	c0.24		0.08	c0.08			c0.17	
v/s Ratio Perm									0.01			
v/c Ratio	0.69	0.41		0.43	0.73		0.62	0.63	0.05		0.73	
Uniform Delay, d1	48.8	25.3		54.0	35.4		48.2	48.2	44.4		41.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	7.0	0.2		1.1	2.5		5.1	4.9	0.1		8.7	
Delay (s)	55.8	25.5		55.1	37.9		53.2	53.1	44.5		49.8	
Level of Service	E	C		E	D		D	D	D		D	
Approach Delay (s)		32.1			38.7			51.4			49.8	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	40.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	117.8	Sum of lost time (s)	20.2
Intersection Capacity Utilization	67.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	87	7	53	87	3	68
Future Volume (Veh/h)	87	7	53	87	3	68
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.80	0.80	0.59	0.59
Hourly flow rate (vph)	97	8	66	109	5	115
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				1272		
pX, platoon unblocked						
vC, conflicting volume			105		342	101
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			105		342	101
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		99	88
cM capacity (veh/h)			1486		625	954

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	105	175	120
Volume Left	0	66	5
Volume Right	8	0	115
cSH	1700	1486	934
Volume to Capacity	0.06	0.04	0.13
Queue Length 95th (ft)	0	3	11
Control Delay (s)	0.0	3.1	9.4
Lane LOS		A	A
Approach Delay (s)	0.0	3.1	9.4
Approach LOS			A

Intersection Summary			
Average Delay	4.2		
Intersection Capacity Utilization	25.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	39	46	41	41	67	74	486	46	48	316	8
Future Volume (vph)	9	39	46	41	41	67	74	486	46	48	316	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.8			6.8		4.7	7.5		4.7	7.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.93			0.94		1.00	0.99		1.00	1.00	
Flt Protected		1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1731			1726		1770	1838		1770	1856	
Flt Permitted		1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1731			1726		1770	1838		1770	1856	
Peak-hour factor, PHF	0.84	0.84	0.84	0.85	0.85	0.85	0.91	0.91	0.91	0.92	0.92	0.92
Adj. Flow (vph)	11	46	55	48	48	79	81	534	51	52	343	9
RTOR Reduction (vph)	0	32	0	0	33	0	0	3	0	0	1	0
Lane Group Flow (vph)	0	80	0	0	142	0	81	582	0	52	351	0
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		6.7			12.2		6.6	34.2		4.3	31.9	
Effective Green, g (s)		6.7			12.2		6.6	34.2		4.3	31.9	
Actuated g/C Ratio		0.08			0.15		0.08	0.41		0.05	0.38	
Clearance Time (s)		6.8			6.8		4.7	7.5		4.7	7.5	
Vehicle Extension (s)		3.0			3.0		3.0	7.0		3.0	7.0	
Lane Grp Cap (vph)		139			253		140	755		91	711	
v/s Ratio Prot		c0.05			c0.08		c0.05	c0.32		0.03	0.19	
v/s Ratio Perm												
v/c Ratio		0.57			0.56		0.58	0.77		0.57	0.49	
Uniform Delay, d1		36.9			33.0		37.0	21.1		38.5	19.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.6			2.8		5.7	6.6		8.4	1.9	
Delay (s)		42.5			35.8		42.6	27.7		46.9	21.4	
Level of Service		D			D		D	C		D	C	
Approach Delay (s)		42.5			35.8			29.6			24.7	
Approach LOS		D			D			C			C	

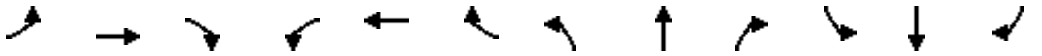
Intersection Summary			
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	83.2	Sum of lost time (s)	25.8
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Yield			Yield			Yield			Yield	
Traffic Volume (vph)	13	0	3	1	0	1	2	20	1	3	9	4
Future Volume (vph)	13	0	3	1	0	1	2	20	1	3	9	4
Peak Hour Factor	0.50	0.50	0.50	0.31	0.31	0.31	0.72	0.72	0.72	0.67	0.67	0.67
Hourly flow rate (vph)	26	0	6	3	0	3	3	28	1	4	13	6

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	32	6	32	23
Volume Left (vph)	26	3	3	4
Volume Right (vph)	6	3	1	6
Hadj (s)	0.08	-0.17	0.03	-0.09
Departure Headway (s)	4.1	3.9	4.0	3.9
Degree Utilization, x	0.04	0.01	0.04	0.03
Capacity (veh/h)	859	908	870	902
Control Delay (s)	7.3	6.9	7.2	7.0
Approach Delay (s)	7.3	6.9	7.2	7.0
Approach LOS	A	A	A	A

Intersection Summary				
Delay	7.2			
Level of Service	A			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	821	38	65	1094	12	0	0	72	0	0	35
Future Volume (Veh/h)	40	821	38	65	1094	12	0	0	72	0	0	35
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.98	0.98	0.98	0.94	0.94	0.94	0.89	0.89	0.89	0.73	0.73	0.73
Hourly flow rate (vph)	41	838	39	69	1164	13	0	0	81	0	0	48
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1177			877			1708	2254	438	1890	2268	588
vC1, stage 1 conf vol							940	940		1308	1308	
vC2, stage 2 conf vol							768	1315		582	959	
vCu, unblocked vol	1177			877			1708	2254	438	1890	2268	588
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			91			100	100	86	100	100	89
cM capacity (veh/h)	589			766			183	144	566	135	156	452

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	41	559	318	69	776	401	81	48
Volume Left	41	0	0	69	0	0	0	0
Volume Right	0	0	39	0	0	13	81	48
cSH	589	1700	1700	766	1700	1700	566	452
Volume to Capacity	0.07	0.33	0.19	0.09	0.46	0.24	0.14	0.11
Queue Length 95th (ft)	6	0	0	7	0	0	12	9
Control Delay (s)	11.6	0.0	0.0	10.2	0.0	0.0	12.4	13.9
Lane LOS	B			B			B	B
Approach Delay (s)	0.5			0.6			12.4	13.9
Approach LOS							B	B

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	40.6%	ICU Level of Service	A	
Analysis Period (min)	15			

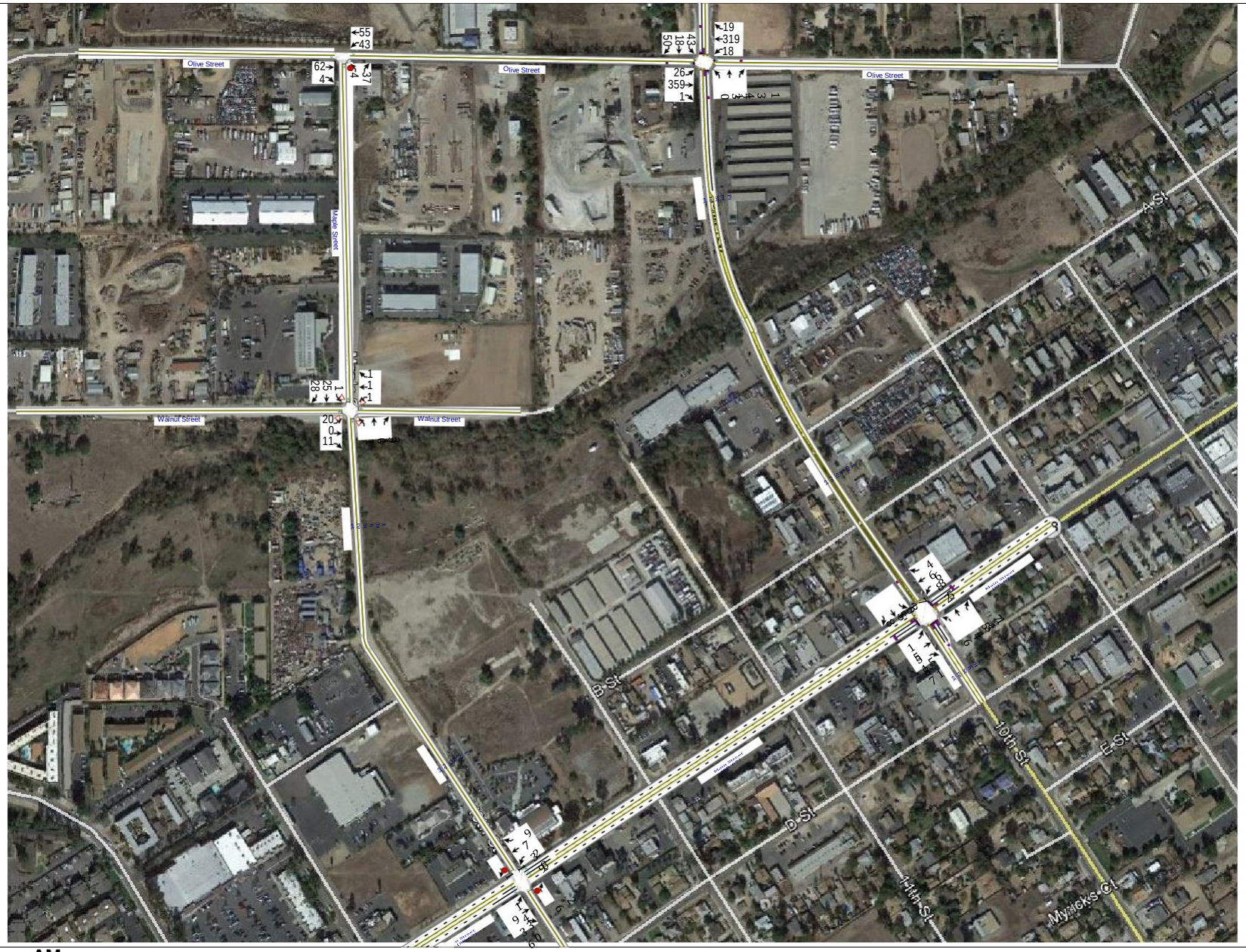
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	769	67	67	548	48	127	144	48	111	219	207
Future Volume (vph)	190	769	67	67	548	48	127	144	48	111	219	207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	4.7		4.7	4.7		5.4	5.4	5.4		5.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00		1.00	
Frt	1.00	0.99		1.00	0.99		1.00	1.00	0.85		0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)	1770	3500		1770	3496		1770	1863	1583		1748	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)	1770	3500		1770	3496		1770	1863	1583		1748	
Peak-hour factor, PHF	0.91	0.91	1.00	0.82	0.82	0.82	0.98	0.98	0.98	0.93	0.93	0.93
Adj. Flow (vph)	209	845	67	82	668	59	130	147	49	119	235	223
RTOR Reduction (vph)	0	3	0	0	4	0	0	0	43	0	13	0
Lane Group Flow (vph)	209	909	0	82	723	0	130	147	6	0	564	0
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	19.4	42.5		10.6	33.7		15.4	15.4	15.4		36.9	
Effective Green, g (s)	19.4	42.5		10.6	33.7		15.4	15.4	15.4		36.9	
Actuated g/C Ratio	0.15	0.34		0.08	0.27		0.12	0.12	0.12		0.29	
Clearance Time (s)	4.7	4.7		4.7	4.7		5.4	5.4	5.4		5.4	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		3.0	3.0	3.0		6.0	
Lane Grp Cap (vph)	273	1184		149	938		217	228	194		513	
v/s Ratio Prot	c0.12	c0.26		0.05	0.21		0.07	c0.08			c0.32	
v/s Ratio Perm									0.00			
v/c Ratio	0.77	0.77		0.55	0.77		0.60	0.64	0.03		1.10	
Uniform Delay, d1	50.9	37.1		55.2	42.4		52.2	52.5	48.5		44.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	10.9	3.0		2.5	4.0		4.4	6.1	0.1		69.9	
Delay (s)	61.8	40.2		57.7	46.4		56.6	58.6	48.6		114.2	
Level of Service	E	D		E	D		E	E	D		F	
Approach Delay (s)		44.2			47.5			56.3			114.2	
Approach LOS		D			D			E			F	

Intersection Summary			
HCM 2000 Control Delay	60.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	125.6	Sum of lost time (s)	20.2
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

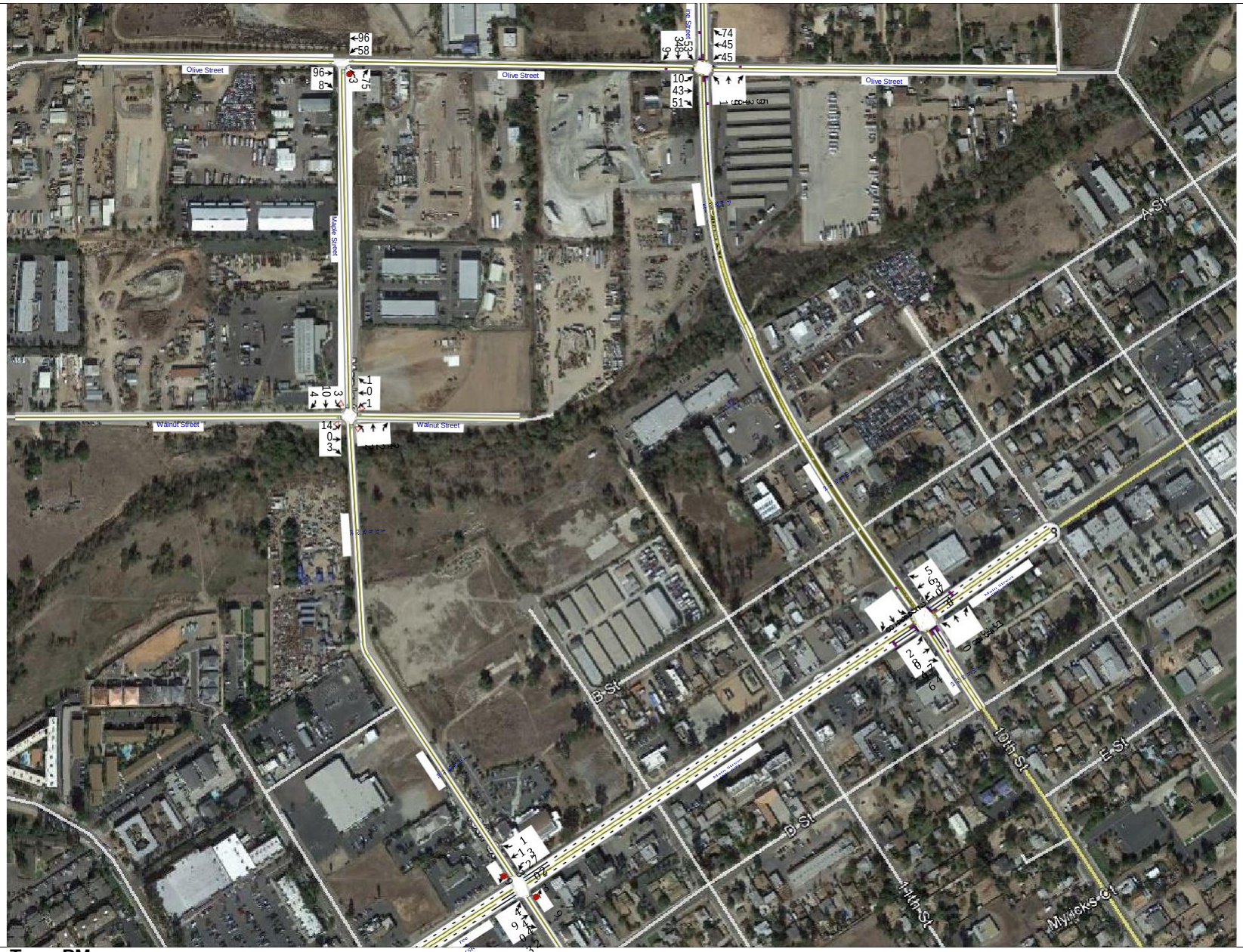
Attachment C
Opening Day (Year 2023) Near-Term Base Conditions
Synchro Worksheets

Map - Near-Term AM
Volumes **10/26/2018**



Near-Term AM
Near-Term AM.syn

Map - Near-Term PM
Volumes **10/26/2018**



Near-Term PM
Near-Term PM.syn

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	62	4	43	55	4	37
Future Volume (Veh/h)	62	4	43	55	4	37
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	67	4	47	60	4	40
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				1272		
pX, platoon unblocked						
vC, conflicting volume			71		223	69
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			71		223	69
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		99	96
cM capacity (veh/h)			1529		742	994

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	71	107	44
Volume Left	0	47	4
Volume Right	4	0	40
cSH	1700	1529	964
Volume to Capacity	0.04	0.03	0.05
Queue Length 95th (ft)	0	2	4
Control Delay (s)	0.0	3.4	8.9
Lane LOS		A	A
Approach Delay (s)	0.0	3.4	8.9
Approach LOS			A

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	21.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	359	1	18	319	19	10	43	134	43	18	50
Future Volume (vph)	26	359	1	18	319	19	10	43	134	43	18	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.8			6.8		4.7	7.5		4.7	7.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		1.00			0.99		1.00	0.89		1.00	0.89	
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1856			1844		1770	1651		1770	1659	
Flt Permitted		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1856			1844		1770	1651		1770	1659	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	390	1	20	347	21	11	47	146	47	20	54
RTOR Reduction (vph)	0	0	0	0	1	0	0	110	0	0	43	0
Lane Group Flow (vph)	0	419	0	0	387	0	11	83	0	47	31	0
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		20.9			23.6		1.3	15.4		4.6	18.7	
Effective Green, g (s)		20.9			23.6		1.3	15.4		4.6	18.7	
Actuated g/C Ratio		0.23			0.26		0.01	0.17		0.05	0.21	
Clearance Time (s)		6.8			6.8		4.7	7.5		4.7	7.5	
Vehicle Extension (s)		3.0			3.0		3.0	7.0		3.0	7.0	
Lane Grp Cap (vph)		429			481		25	281		90	343	
v/s Ratio Prot		c0.23			c0.21		0.01	c0.05		c0.03	c0.02	
v/s Ratio Perm												
v/c Ratio		0.98			0.80		0.44	0.29		0.52	0.09	
Uniform Delay, d1		34.5			31.2		44.1	32.7		41.8	28.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		37.0			9.4		11.9	2.1		5.4	0.4	
Delay (s)		71.4			40.6		56.0	34.8		47.2	29.3	
Level of Service		E			D		E	C		D	C	
Approach Delay (s)		71.4			40.6			35.9			36.3	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	50.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	90.3	Sum of lost time (s)	25.8
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Yield			Yield			Yield			Yield	
Traffic Volume (vph)	20	0	11	1	1	1	11	30	3	1	25	28
Future Volume (vph)	20	0	11	1	1	1	11	30	3	1	25	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	0	12	1	1	1	12	33	3	1	27	30

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	34	3	48	58
Volume Left (vph)	22	1	12	1
Volume Right (vph)	12	1	3	30
Hadj (s)	-0.05	-0.10	0.05	-0.27
Departure Headway (s)	4.1	4.1	4.1	3.8
Degree Utilization, x	0.04	0.00	0.05	0.06
Capacity (veh/h)	857	860	861	943
Control Delay (s)	7.2	7.1	7.3	7.0
Approach Delay (s)	7.2	7.1	7.3	7.0
Approach LOS	A	A	A	A

Intersection Summary				
Delay	7.2			
Level of Service	A			
Intersection Capacity Utilization	18.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	936	30	28	739	9	0	0	26	0	0	11
Future Volume (Veh/h)	14	936	30	28	739	9	0	0	26	0	0	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	1017	33	30	803	10	0	0	28	0	0	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	813			1050			1537	1936	525	1434	1948	406
vC1, stage 1 conf vol							1064	1064		868	868	
vC2, stage 2 conf vol							474	873		566	1080	
vCu, unblocked vol	813			1050			1537	1936	525	1434	1948	406
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			95			100	100	94	100	100	98
cM capacity (veh/h)	810			659			213	222	497	249	210	594

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	15	678	372	30	535	278	28	12
Volume Left	15	0	0	30	0	0	0	0
Volume Right	0	0	33	0	0	10	28	12
cSH	810	1700	1700	659	1700	1700	497	594
Volume to Capacity	0.02	0.40	0.22	0.05	0.31	0.16	0.06	0.02
Queue Length 95th (ft)	1	0	0	4	0	0	4	2
Control Delay (s)	9.5	0.0	0.0	10.7	0.0	0.0	12.7	11.2
Lane LOS	A			B			B	B
Approach Delay (s)	0.1			0.4			12.7	11.2
Approach LOS							B	B

Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	36.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	158	517	51	35	682	46	146	154	75	76	86	158
Future Volume (vph)	158	517	51	35	682	46	146	154	75	76	86	158
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	4.7		4.7	4.7		5.4	5.4	5.4		5.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00		1.00	
Frt	1.00	0.99		1.00	0.99		1.00	1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)	1770	3492		1770	3506		1770	1863	1583		1718	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)	1770	3492		1770	3506		1770	1863	1583		1718	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	172	562	55	38	741	50	159	167	82	83	93	172
RTOR Reduction (vph)	0	4	0	0	3	0	0	0	69	0	21	0
Lane Group Flow (vph)	172	613	0	38	788	0	159	167	13	0	327	0
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	16.6	46.0		6.2	35.6		16.8	16.8	16.8		30.9	
Effective Green, g (s)	16.6	46.0		6.2	35.6		16.8	16.8	16.8		30.9	
Actuated g/C Ratio	0.14	0.38		0.05	0.30		0.14	0.14	0.14		0.26	
Clearance Time (s)	4.7	4.7		4.7	4.7		5.4	5.4	5.4		5.4	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		3.0	3.0	3.0		6.0	
Lane Grp Cap (vph)	244	1337		91	1039		247	260	221		442	
v/s Ratio Prot	c0.10	0.18		0.02	c0.22		c0.09	0.09			c0.19	
v/s Ratio Perm									0.01			
v/c Ratio	0.70	0.46		0.42	0.76		0.64	0.64	0.06		0.74	
Uniform Delay, d1	49.4	27.7		55.2	38.3		48.8	48.8	44.8		40.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	7.3	0.3		1.1	3.2		5.6	5.3	0.1		8.7	
Delay (s)	56.8	28.0		56.3	41.6		54.5	54.2	44.9		49.6	
Level of Service	E	C		E	D		D	D	D		D	
Approach Delay (s)		34.3			42.3			52.4			49.6	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	42.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.1	Sum of lost time (s)	20.2
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	96	8	58	96	3	75
Future Volume (Veh/h)	96	8	58	96	3	75
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	104	9	63	104	3	82
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				1272		
pX, platoon unblocked						
vC, conflicting volume			113		338	108
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			113		338	108
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		100	91
cM capacity (veh/h)			1476		629	945

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	113	167	85
Volume Left	0	63	3
Volume Right	9	0	82
cSH	1700	1476	929
Volume to Capacity	0.07	0.04	0.09
Queue Length 95th (ft)	0	3	8
Control Delay (s)	0.0	3.1	9.3
Lane LOS		A	A
Approach Delay (s)	0.0	3.1	9.3
Approach LOS			A

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	26.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	43	51	45	45	74	81	535	51	53	348	9
Future Volume (vph)	10	43	51	45	45	74	81	535	51	53	348	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.8			6.8		4.7	7.5		4.7	7.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.93			0.94		1.00	0.99		1.00	1.00	
Flt Protected		1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1732			1726		1770	1839		1770	1856	
Flt Permitted		1.00			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1732			1726		1770	1839		1770	1856	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	47	55	49	49	80	88	582	55	58	378	10
RTOR Reduction (vph)	0	32	0	0	33	0	0	3	0	0	1	0
Lane Group Flow (vph)	0	81	0	0	145	0	88	634	0	58	387	0
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		6.6			12.4		6.7	36.0		6.2	35.5	
Effective Green, g (s)		6.6			12.4		6.7	36.0		6.2	35.5	
Actuated g/C Ratio		0.08			0.14		0.08	0.41		0.07	0.41	
Clearance Time (s)		6.8			6.8		4.7	7.5		4.7	7.5	
Vehicle Extension (s)		3.0			3.0		3.0	7.0		3.0	7.0	
Lane Grp Cap (vph)		131			246		136	760		126	757	
v/s Ratio Prot		c0.05			c0.08		c0.05	c0.34		0.03	0.21	
v/s Ratio Perm												
v/c Ratio		0.62			0.59		0.65	0.83		0.46	0.51	
Uniform Delay, d1		39.0			34.9		39.0	22.8		38.8	19.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		8.3			3.6		10.1	9.5		2.7	1.9	
Delay (s)		47.3			38.5		49.1	32.3		41.4	21.2	
Level of Service		D			D		D	C		D	C	
Approach Delay (s)		47.3			38.5			34.4			23.8	
Approach LOS		D			D			C			C	

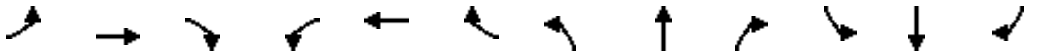
Intersection Summary			
HCM 2000 Control Delay	32.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	87.0	Sum of lost time (s)	25.8
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Yield			Yield			Yield			Yield	
Traffic Volume (vph)	14	0	3	1	0	1	2	22	1	3	10	4
Future Volume (vph)	14	0	3	1	0	1	2	22	1	3	10	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	0	3	1	0	1	2	24	1	3	11	4

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	18	2	27	18
Volume Left (vph)	15	1	2	3
Volume Right (vph)	3	1	1	4
Hadj (s)	0.10	-0.17	0.03	-0.07
Departure Headway (s)	4.1	3.8	4.0	3.9
Degree Utilization, x	0.02	0.00	0.03	0.02
Capacity (veh/h)	863	919	885	911
Control Delay (s)	7.2	6.9	7.1	7.0
Approach Delay (s)	7.2	6.9	7.1	7.0
Approach LOS	A	A	A	A

Intersection Summary				
Delay	7.1			
Level of Service	A			
Intersection Capacity Utilization	13.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	903	42	72	1203	13	0	0	79	0	0	39
Future Volume (Veh/h)	44	903	42	72	1203	13	0	0	79	0	0	39
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	48	982	46	78	1308	14	0	0	86	0	0	42
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1322			1028			1953	2579	514	2144	2595	661
vC1, stage 1 conf vol							1101	1101		1471	1471	
vC2, stage 2 conf vol							852	1478		673	1124	
vCu, unblocked vol	1322			1028			1953	2579	514	2144	2595	661
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91			88			100	100	83	100	100	90
cM capacity (veh/h)	519			671			143	105	505	103	118	405

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	48	655	373	78	872	450	86	42
Volume Left	48	0	0	78	0	0	0	0
Volume Right	0	0	46	0	0	14	86	42
cSH	519	1700	1700	671	1700	1700	505	405
Volume to Capacity	0.09	0.39	0.22	0.12	0.51	0.26	0.17	0.10
Queue Length 95th (ft)	8	0	0	10	0	0	15	9
Control Delay (s)	12.7	0.0	0.0	11.1	0.0	0.0	13.6	14.9
Lane LOS	B			B			B	B
Approach Delay (s)	0.6			0.6			13.6	14.9
Approach LOS							B	B

Intersection Summary				
Average Delay	1.3			
Intersection Capacity Utilization	43.7%	ICU Level of Service	A	
Analysis Period (min)	15			

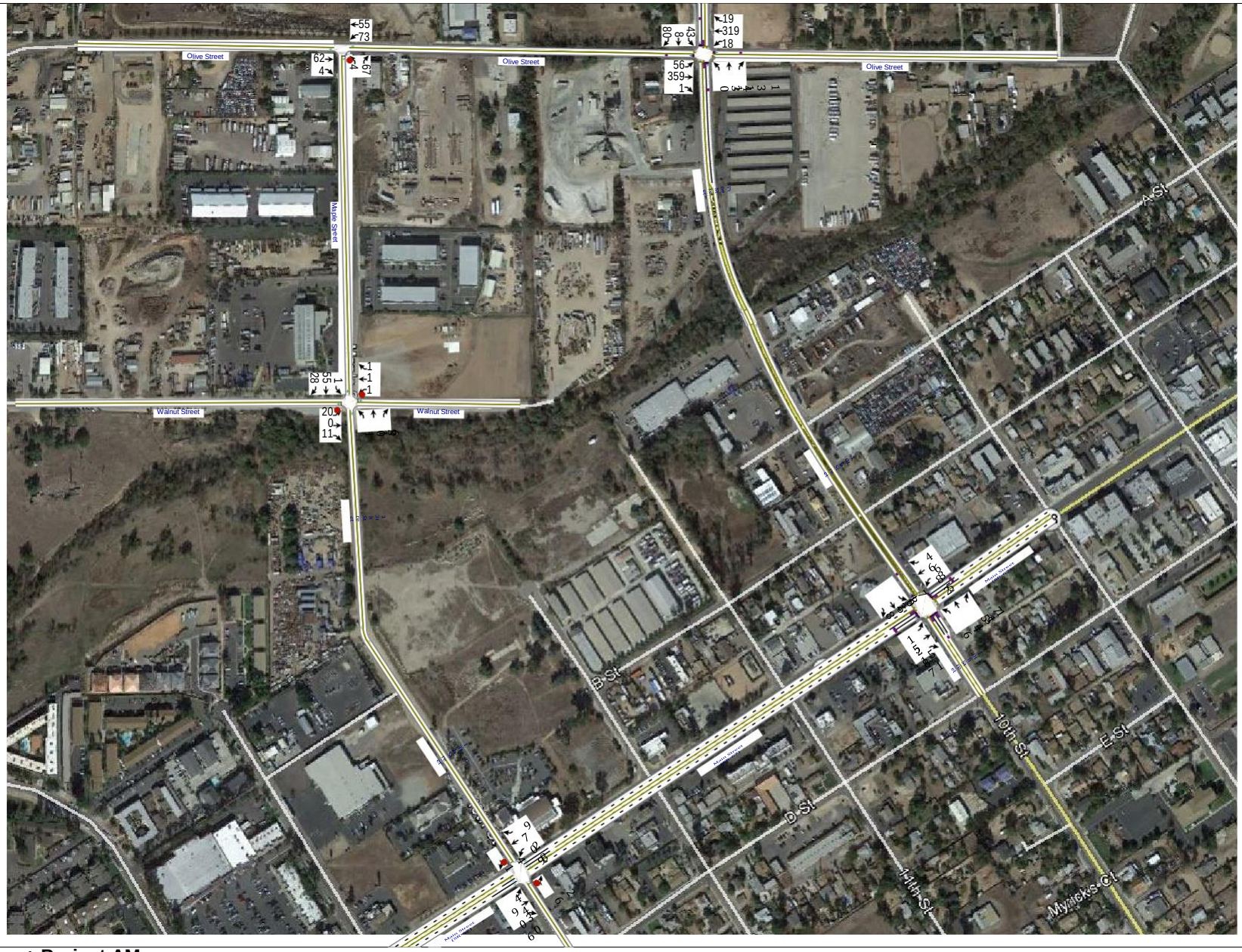
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	209	846	74	74	603	53	140	158	53	122	241	228
Future Volume (vph)	209	846	74	74	603	53	140	158	53	122	241	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	4.7		4.7	4.7		5.4	5.4	5.4		5.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00		1.00	
Frt	1.00	0.99		1.00	0.99		1.00	1.00	0.85		0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)	1770	3497		1770	3496		1770	1863	1583		1748	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)	1770	3497		1770	3496		1770	1863	1583		1748	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	227	920	80	80	655	58	152	172	58	133	262	248
RTOR Reduction (vph)	0	3	0	0	4	0	0	0	50	0	13	0
Lane Group Flow (vph)	227	997	0	80	709	0	152	172	8	0	630	0
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	21.2	43.9		10.7	33.4		17.7	17.7	17.7		37.0	
Effective Green, g (s)	21.2	43.9		10.7	33.4		17.7	17.7	17.7		37.0	
Actuated g/C Ratio	0.16	0.34		0.08	0.26		0.14	0.14	0.14		0.29	
Clearance Time (s)	4.7	4.7		4.7	4.7		5.4	5.4	5.4		5.4	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		3.0	3.0	3.0		6.0	
Lane Grp Cap (vph)	289	1185		146	901		241	254	216		499	
v/s Ratio Prot	c0.13	c0.29		0.05	0.20		0.09	c0.09			c0.36	
v/s Ratio Perm									0.01			
v/c Ratio	0.79	0.84		0.55	0.79		0.63	0.68	0.04		1.26	
Uniform Delay, d1	52.0	39.6		57.1	44.7		52.8	53.2	48.5		46.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	12.2	5.6		2.2	4.6		5.3	7.0	0.1		133.6	
Delay (s)	64.1	45.1		59.3	49.3		58.1	60.2	48.6		179.9	
Level of Service	E	D		E	D		E	E	D		F	
Approach Delay (s)		48.6			50.3			57.6			179.9	
Approach LOS		D			D			E			F	

Intersection Summary			
HCM 2000 Control Delay	77.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	129.5	Sum of lost time (s)	20.2
Intersection Capacity Utilization	90.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

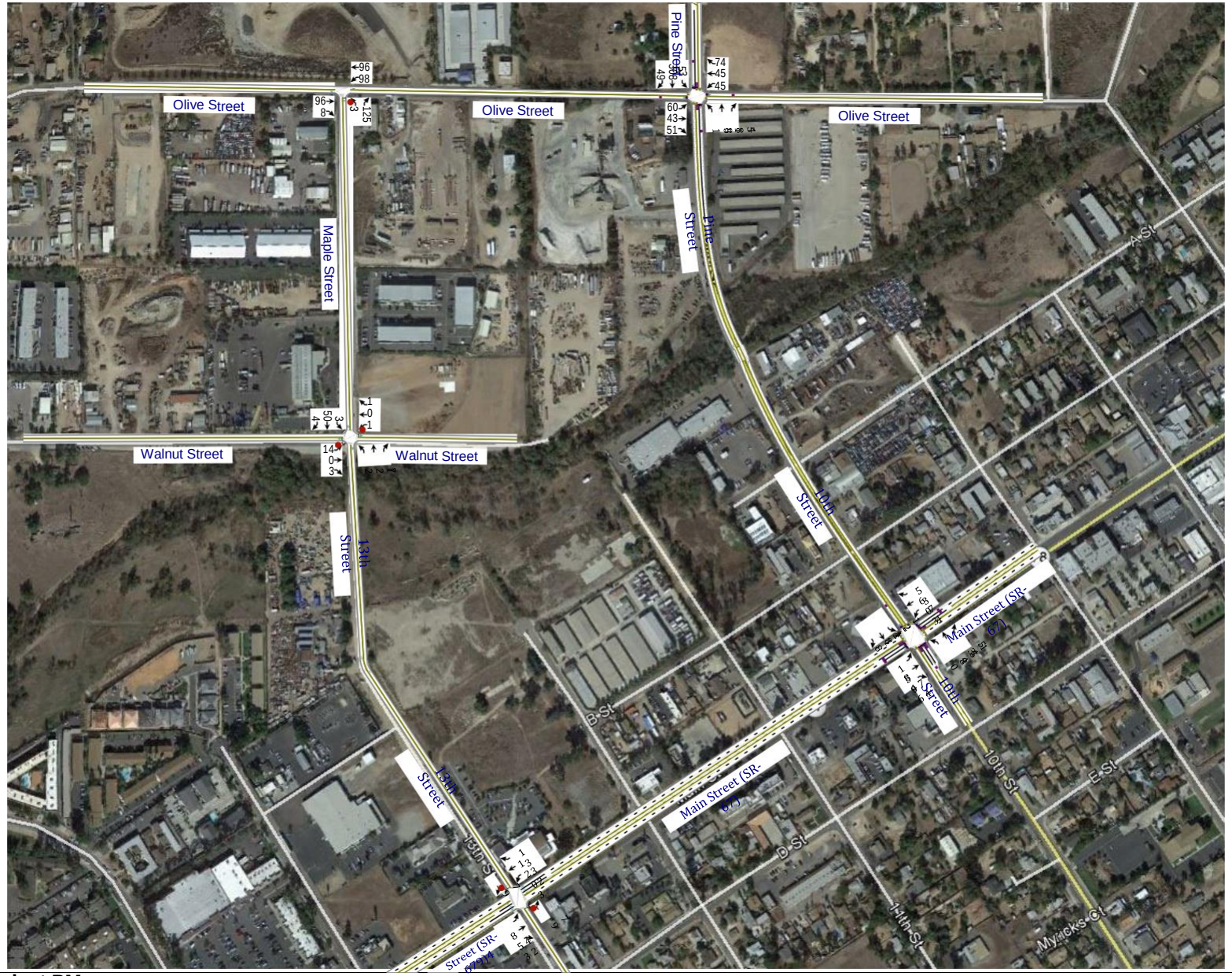
Attachment D
Opening Day (Year 2023) Near-Term Plus Project Conditions Synchro Worksheets

Map - Near-Term + Project AM
Volumes **10/26/2018**



Near-Term + Project AM
Near-Term + Project AM.syn

Map - Near-Term + Project PM
Volumes **10/26/2018**



Near-Term + Project PM
Near-Term + Project PM.syn

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	62	4	73	55	4	67
Future Volume (Veh/h)	62	4	73	55	4	67
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	67	4	79	60	4	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				1272		
pX, platoon unblocked						
vC, conflicting volume			71		287	69
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			71		287	69
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		99	93
cM capacity (veh/h)			1529		667	994

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	71	139	77
Volume Left	0	79	4
Volume Right	4	0	73
cSH	1700	1529	969
Volume to Capacity	0.04	0.05	0.08
Queue Length 95th (ft)	0	4	6
Control Delay (s)	0.0	4.4	9.0
Lane LOS		A	A
Approach Delay (s)	0.0	4.4	9.0
Approach LOS			A

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	24.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	359	1	18	319	19	10	13	134	43	8	80
Future Volume (vph)	56	359	1	18	319	19	10	13	134	43	8	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.8			6.8		4.7	7.5		4.7	7.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		1.00			0.99		1.00	0.86		1.00	0.86	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1850			1844		1770	1608		1770	1610	
Flt Permitted		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1850			1844		1770	1608		1770	1610	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	61	390	1	20	347	21	11	14	146	47	9	87
RTOR Reduction (vph)	0	0	0	0	1	0	0	123	0	0	70	0
Lane Group Flow (vph)	0	452	0	0	387	0	11	37	0	47	26	0
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		20.7			23.4		1.4	13.6		4.6	16.8	
Effective Green, g (s)		20.7			23.4		1.4	13.6		4.6	16.8	
Actuated g/C Ratio		0.23			0.27		0.02	0.15		0.05	0.19	
Clearance Time (s)		6.8			6.8		4.7	7.5		4.7	7.5	
Vehicle Extension (s)		3.0			3.0		3.0	7.0		3.0	7.0	
Lane Grp Cap (vph)		434			489		28	248		92	307	
v/s Ratio Prot		c0.24			c0.21		0.01	c0.02		c0.03	c0.02	
v/s Ratio Perm												
v/c Ratio		1.04			0.79		0.39	0.15		0.51	0.08	
Uniform Delay, d1		33.7			30.1		42.9	32.2		40.7	29.3	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		54.4			8.5		8.9	1.0		4.7	0.4	
Delay (s)		88.1			38.6		51.8	33.2		45.4	29.7	
Level of Service		F			D		D	C		D	C	
Approach Delay (s)		88.1			38.6			34.4			34.9	
Approach LOS		F			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	56.9	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	88.1	Sum of lost time (s)	25.8
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	0	11	1	1	1	11	60	3	1	55	28
Future Volume (Veh/h)	20	0	11	1	1	1	11	60	3	1	55	28
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	0	12	1	1	1	12	65	3	1	60	30
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	169	169	75	180	182	66	90			68		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	169	169	75	180	182	66	90			68		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	99	100	100	100	99			100		
cM capacity (veh/h)	788	718	986	768	705	997	1505			1533		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	34	3	80	91
Volume Left	22	1	12	1
Volume Right	12	1	3	30
cSH	848	806	1505	1533
Volume to Capacity	0.04	0.00	0.01	0.00
Queue Length 95th (ft)	3	0	1	0
Control Delay (s)	9.4	9.5	1.2	0.1
Lane LOS	A	A	A	A
Approach Delay (s)	9.4	9.5	1.2	0.1
Approach LOS	A	A		

Intersection Summary				
Average Delay	2.2			
Intersection Capacity Utilization	20.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	906	30	28	709	9	0	0	26	0	0	41
Future Volume (Veh/h)	44	906	30	28	709	9	0	0	26	0	0	41
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	48	985	33	30	771	10	0	0	28	0	0	45
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	781			1018			1588	1938	509	1452	1950	390
vC1, stage 1 conf vol							1098	1098		836	836	
vC2, stage 2 conf vol							490	841		616	1114	
vCu, unblocked vol	781			1018			1588	1938	509	1452	1950	390
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			96			100	100	95	100	100	93
cM capacity (veh/h)	832			677			192	207	509	245	199	608

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	48	657	361	30	514	267	28	45
Volume Left	48	0	0	30	0	0	0	0
Volume Right	0	0	33	0	0	10	28	45
cSH	832	1700	1700	677	1700	1700	509	608
Volume to Capacity	0.06	0.39	0.21	0.04	0.30	0.16	0.05	0.07
Queue Length 95th (ft)	5	0	0	3	0	0	4	6
Control Delay (s)	9.6	0.0	0.0	10.6	0.0	0.0	12.5	11.4
Lane LOS	A			B			B	B
Approach Delay (s)	0.4			0.4			12.5	11.4
Approach LOS							B	B

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	36.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	128	517	51	35	682	46	146	154	75	76	86	128
Future Volume (vph)	128	517	51	35	682	46	146	154	75	76	86	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	4.7		4.7	4.7		5.4	5.4	5.4		5.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00		1.00	
Frt	1.00	0.99		1.00	0.99		1.00	1.00	0.85		0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)	1770	3492		1770	3506		1770	1863	1583		1729	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)	1770	3492		1770	3506		1770	1863	1583		1729	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	139	562	55	38	741	50	159	167	82	83	93	139
RTOR Reduction (vph)	0	4	0	0	3	0	0	0	68	0	17	0
Lane Group Flow (vph)	139	613	0	38	788	0	159	167	14	0	298	0
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	14.0	42.9		6.1	35.0		16.4	16.4	16.4		28.0	
Effective Green, g (s)	14.0	42.9		6.1	35.0		16.4	16.4	16.4		28.0	
Actuated g/C Ratio	0.12	0.38		0.05	0.31		0.14	0.14	0.14		0.25	
Clearance Time (s)	4.7	4.7		4.7	4.7		5.4	5.4	5.4		5.4	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		3.0	3.0	3.0		6.0	
Lane Grp Cap (vph)	218	1318		95	1080		255	268	228		426	
v/s Ratio Prot	c0.08	0.18		0.02	c0.22		c0.09	0.09			c0.17	
v/s Ratio Perm									0.01			
v/c Ratio	0.64	0.47		0.40	0.73		0.62	0.62	0.06		0.70	
Uniform Delay, d1	47.4	26.7		52.0	35.1		45.7	45.7	41.9		39.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	4.4	0.3		1.0	2.5		4.7	4.5	0.1		7.3	
Delay (s)	51.8	27.0		53.0	37.6		50.4	50.2	42.1		46.3	
Level of Service	D	C		D	D		D	D	D		D	
Approach Delay (s)		31.5			38.3			48.6			46.3	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	39.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	113.6	Sum of lost time (s)	20.2
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	96	8	98	96	3	125
Future Volume (Veh/h)	96	8	98	96	3	125
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	104	9	107	104	3	136
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				1272		
pX, platoon unblocked						
vC, conflicting volume			113		426	108
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			113		426	108
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			93		99	86
cM capacity (veh/h)			1476		542	945

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	113	211	139
Volume Left	0	107	3
Volume Right	9	0	136
cSH	1700	1476	930
Volume to Capacity	0.07	0.07	0.15
Queue Length 95th (ft)	0	6	13
Control Delay (s)	0.0	4.2	9.5
Lane LOS		A	A
Approach Delay (s)	0.0	4.2	9.5
Approach LOS			A

Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	31.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	43	51	45	45	74	81	485	51	53	308	49
Future Volume (vph)	60	43	51	45	45	74	81	485	51	53	308	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		6.8			6.8		4.7	7.5		4.7	7.5	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.94		1.00	0.99		1.00	0.98	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1746			1726		1770	1836		1770	1825	
Flt Permitted		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1746			1726		1770	1836		1770	1825	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	47	55	49	49	80	88	527	55	58	335	53
RTOR Reduction (vph)	0	17	0	0	33	0	0	3	0	0	5	0
Lane Group Flow (vph)	0	150	0	0	145	0	88	579	0	58	383	0
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)		6.7			12.3		6.6	34.0		6.0	33.4	
Effective Green, g (s)		6.7			12.3		6.6	34.0		6.0	33.4	
Actuated g/C Ratio		0.08			0.15		0.08	0.40		0.07	0.39	
Clearance Time (s)		6.8			6.8		4.7	7.5		4.7	7.5	
Vehicle Extension (s)		3.0			3.0		3.0	7.0		3.0	7.0	
Lane Grp Cap (vph)		137			250		137	736		125	718	
v/s Ratio Prot		c0.09			c0.08		c0.05	c0.32		0.03	0.21	
v/s Ratio Perm												
v/c Ratio		1.10			0.58		0.64	0.79		0.46	0.53	
Uniform Delay, d1		39.0			33.8		38.0	22.2		37.9	19.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		105.6			3.2		9.9	7.3		2.7	2.2	
Delay (s)		144.6			37.1		47.8	29.5		40.6	22.0	
Level of Service		F			D		D	C		D	C	
Approach Delay (s)		144.6			37.1			31.9			24.4	
Approach LOS		F			D			C			C	

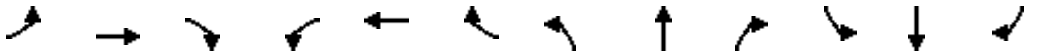
Intersection Summary			
HCM 2000 Control Delay	43.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	84.8	Sum of lost time (s)	25.8
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	0	3	1	0	1	2	72	1	3	50	4
Future Volume (Veh/h)	14	0	3	1	0	1	2	72	1	3	50	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	0	3	1	0	1	2	78	1	3	54	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	146	145	56	148	146	78	58			79		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	146	145	56	148	146	78	58			79		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	100	100	100	100	100			100		
cM capacity (veh/h)	820	744	1011	816	742	982	1546			1519		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	18	2	81	61
Volume Left	15	1	2	3
Volume Right	3	1	1	4
cSH	847	892	1546	1519
Volume to Capacity	0.02	0.00	0.00	0.00
Queue Length 95th (ft)	2	0	0	0
Control Delay (s)	9.3	9.0	0.2	0.4
Lane LOS	A	A	A	A
Approach Delay (s)	9.3	9.0	0.2	0.4
Approach LOS	A	A		

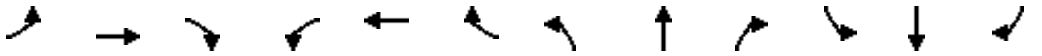
Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	14.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	853	42	32	1203	13	0	0	79	0	0	79
Future Volume (Veh/h)	94	853	42	32	1203	13	0	0	79	0	0	79
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	102	927	46	35	1308	14	0	0	86	0	0	86
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1322			973			1964	2546	486	2138	2562	661
vC1, stage 1 conf vol							1154	1154		1385	1385	
vC2, stage 2 conf vol							810	1392		754	1177	
vCu, unblocked vol	1322			973			1964	2546	486	2138	2562	661
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	80			95			100	100	84	100	100	79
cM capacity (veh/h)	519			704			112	86	527	115	128	405

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	102	618	355	35	872	450	86	86
Volume Left	102	0	0	35	0	0	0	0
Volume Right	0	0	46	0	0	14	86	86
cSH	519	1700	1700	704	1700	1700	527	405
Volume to Capacity	0.20	0.36	0.21	0.05	0.51	0.26	0.16	0.21
Queue Length 95th (ft)	18	0	0	4	0	0	14	20
Control Delay (s)	13.6	0.0	0.0	10.4	0.0	0.0	13.2	16.3
Lane LOS	B			B			B	C
Approach Delay (s)	1.3			0.3			13.2	16.3
Approach LOS							B	C

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	45.5%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	159	846	74	74	603	53	140	158	53	122	241	188
Future Volume (vph)	159	846	74	74	603	53	140	158	53	122	241	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.7	4.7		4.7	4.7		5.4	5.4	5.4		5.4	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00		1.00	
Frt	1.00	0.99		1.00	0.99		1.00	1.00	0.85		0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (prot)	1770	3497		1770	3496		1770	1863	1583		1758	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.99	
Satd. Flow (perm)	1770	3497		1770	3496		1770	1863	1583		1758	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	173	920	80	80	655	58	152	172	58	133	262	204
RTOR Reduction (vph)	0	3	0	0	4	0	0	0	50	0	11	0
Lane Group Flow (vph)	173	997	0	80	709	0	152	172	8	0	588	0
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases									8			
Actuated Green, G (s)	16.8	40.3		10.4	33.9		17.1	17.1	17.1		36.9	
Effective Green, g (s)	16.8	40.3		10.4	33.9		17.1	17.1	17.1		36.9	
Actuated g/C Ratio	0.13	0.32		0.08	0.27		0.14	0.14	0.14		0.30	
Clearance Time (s)	4.7	4.7		4.7	4.7		5.4	5.4	5.4		5.4	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		3.0	3.0	3.0		6.0	
Lane Grp Cap (vph)	238	1128		147	948		242	255	216		519	
v/s Ratio Prot	c0.10	c0.29		0.05	0.20		0.09	c0.09			c0.33	
v/s Ratio Perm									0.01			
v/c Ratio	0.73	0.88		0.54	0.75		0.63	0.67	0.04		1.13	
Uniform Delay, d1	51.8	40.1		55.0	41.6		50.9	51.3	46.8		44.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	
Incremental Delay, d2	9.0	8.4		2.2	3.3		5.0	6.9	0.1		81.8	
Delay (s)	60.9	48.5		57.2	44.9		55.9	58.1	46.8		125.8	
Level of Service	E	D		E	D		E	E	D		F	
Approach Delay (s)		50.3			46.1			55.5			125.8	
Approach LOS		D			D			E			F	

Intersection Summary			
HCM 2000 Control Delay	65.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	124.9	Sum of lost time (s)	20.2
Intersection Capacity Utilization	87.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group