Print Form

Notice of Determination

Appendix D

To:

☒ Office of Planning and Research

U.S. Mail:
P.O. Box 3044
Sacramento, CA 95812-3044

Street Address:
1400 Tenth St., Rm 113
Sacramento, CA 95814

☒ County Clerk
County of: Alameda
Address: 1106 Madison Street Oakland, CA 94607

From:

Public Agency: County of Alameda
Address: General Services Agency (GSA)
1401 Lakeside Drive, Suite 800, Oakland CA 94612
Contact: Bernadette Delgado, Program Mgr. GSA
Phone: (510) 208-9590

Lead Agency (if different from above):
Address:
Contact:
Phone:

ENDORSED
FILED
ALAMEDA COUNTY
JUN 13 2019
MELISSA WILK, County Clerk
By _______ Deputy

SUBJECT: Filing of Notice of Determination in compliance with Section 21108 or 21152 of the Public Resources Code.

State Clearinghouse Number (if submitted to State Clearinghouse): 2000112039

Project Title: Dublin Transit Center Parking Garage

Project Applicant: County of Alameda General Services Agency

Project Location (include county): Dublin/Pleasanton BART Station, 5801 Owens Drive, Pleasanton, CA 94588

Project Description:
Project shall utilize the approximate eastern half of the project site for a new 5-story freestanding public parking garage, providing approximately 570 parking spaces for vanpool, electric vehicle, and other vehicle commuters from the Livermore-Amadore Valley and beyond to the transit hub at the Dublin Pleasanton BART station.

This is to advise that the County of Alameda Board of Supervisors (☒ Lead Agency or ☐ Responsible Agency) has approved the above described project on June 4, 2019 (date) and has made the following determinations regarding the above described project.

1. The project [☐ will ☒ will not] have a significant effect on the environment.
2. ☐ An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.
   ☒ A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures [☐ were ☒ were not] made a condition of the approval of the project.
4. A mitigation reporting or monitoring plan [☐ was ☒ was not] adopted for this project.
5. A statement of Overriding Considerations [☐ was ☒ was not] adopted for this project.
6. Findings [☒ were ☐ were not] made pursuant to the provisions of CEQA.

This is to certify that the final EIR with comments and responses and record of project approval, or the negative Declaration, is available to the General Public at:

____

Signature (Public Agency): Bernadette Delgado Title: Capital Program Mgr., GSA

Date: June 13, 2019

Date Received for filing at OPR: Governor's Office of Planning & Research JUNE 14 2019 STATE CLEARINGHOUSE

Authority cited: Sections 21083, Public Resources Code.
Reference Section 21000-21174, Public Resources Code.

Revised 2011

State of California - Department of Fish and Wildlife
2019 ENVIRONMENTAL FILING FEE CASH RECEIPT
DFW 753.5a (REV. 12/01/18) Previously DFG 753.5a

Print | StartOver | Finalize&Email

AC RECEIPT # 2555206

RECEIPT NUMBER:
01 — 06/13/2019 — 372

STATE CLEARINGHOUSE NUMBER *(If applicable)*

SEE INSTRUCTIONS ON REVERSE. TYPE OR PRINT CLEARLY.

LEAD AGENCY	LEAD AGENCY EMAIL	DATE
COUNTY OF ALAMEDA, GENERAL SERVICES AGENCY		06/13/2019

COUNTY/STATE AGENCY OF FILING	DOCUMENT NUMBER
Alameda	19-372

PROJECT TITLE
DUBLIN TRANSIT CENTER PARKING GARAGE

PROJECT APPLICANT NAME	PROJECT APPLICANT EMAIL	PHONE NUMBER
BERNADETTE DELGADO, PROGRAM MGR, GSA		(510) 208-9590

PROJECT APPLICANT ADDRESS	CITY	STATE	ZIP CODE
1401 LAKESIDE DRIVE, SUITE 800	OAKLAND	CA	94612

PROJECT APPLICANT *(Check appropriate box)*
☑ Local Public Agency ☐ School District ☐ Other Special District ☐ State Agency ☐ Private Entity

CHECK APPLICABLE FEES:

☐ Environmental Impact Report (EIR)	$3,271.00	$	0.00
☑ Mitigated/Negative Declaration (MND)(ND)	$2,354.75	$	2,354.75
☐ Certified Regulatory Program (CRP) document - payment due directly to CDFW	$1,112.00	$	0.00

☐ Exempt from fee
- ☐ Notice of Exemption (attach)
- ☐ CDFW No Effect Determination (attach)

☐ Fee previously paid (attach previously issued cash receipt copy)

☐ Water Right Application or Petition Fee (State Water Resources Control Board only)	$850.00	$	0.00
☑ County documentary handling fee		$	50.00
☐ Other		$	

PAYMENT METHOD:
☐ Cash ☐ Credit ☐ Check ☑ Other **TOTAL RECEIVED** $ 2,404.75

SIGNATURE	AGENCY OF FILING PRINTED NAME AND TITLE
X	A. MORAN , DEPUTY CLERK

ALAMEDA COUNTY CLERK-RECORDER
1106 MADISON STREET
OAKLAND, CA 94607
(510)272-6362

ISSUED TO:IDSO - ALACO GSA

RECEIPT # 2555206
06/13/2019 03:55:05 PM

SERVICE	PAGES	QTY	FEE
GENERAL BUS	1	1	2,404.75

=============

Total Amount Due $2,404.75

ON ACCT 5179 2,404.75

=============

Total Payments: $2,404.75

Balance for # 5179
06/13/2019 12:00 AM$-5,442.50

MELISSA WILK
CLERK RECORDER
Deputy: AMORAN

ENDORSED
FILED
ALAMEDA COUNTY

JUN 13 2019

MELISSA WILK, County Clerk
By __________ Deputy

*ENVIRONMENTAL DECLARATION

(CALIFORNIA FISH AND GAME CODE SECTION 711.4)

LEAD AGENCY NAME AND ADDRESS	FOR COUNTY CLERK USE ONLY
County of Alameda General Services Agency 1401 Lakeside Drive, Suite 800 Oakland, CA 94612	19-372 FILE NO: ______________________

CLASSIFICATION OF ENVIRONMENTAL DOCUMENT:

(PLEASE MARK ONLY ONE CLASSIFICATION)

1. NOTICE OF EXEMPTION / STATEMENT OF EXEMPTION

[ ] A - STATUTORILY OR CATEGORICALLY EXEMPT

$ 50.00 - COUNTY CLERK HANDLING FEE

2. NOTICE OF DETERMINATION (NOD)

[X] A - NEGATIVE DECLARATION (OR MITIGATED NEG. DEC.)

$ 2,354.75 - STATE FILING FEE

$ 50.00 - COUNTY CLERK HANDLING FEE

[ ] B - ENVIRONMENTAL IMPACT REPORT (EIR)

$ 3,271.00 - STATE FILING FEE

$ 50.00 - COUNTY CLERK HANDLING FEE

3. OTHER: ______________________

*****A COPY OF THIS FORM MUST BE COMPLETED AND SUBMITTED WITH EACH COPY OF AN ENVIRONMENTAL DECLARATION BEING FILED WITH THE ALAMEDA COUNTY CLERK.*****

BY MAIL FILINGS:

PLEASE INCLUDE FIVE (5) COPIES OF ALL NECESSARY DOCUMENTS AND TWO (2) SELF-ADDRESSED ENVELOPES.

IN PERSON FILINGS:

PLEASE INCLUDE FIVE (5) COPIES OF ALL NECESSARY DOCUMENTS AND ONE (1) SELF-ADDRESSED ENVELOPES.

ALL APPLICABLE FEES MUST BE PAID AT THE TIME OF FILING.

FEES ARE EFFECTIVE JANUARY 1, 2019

MAKE CHECKS PAYABLE TO: ALAMEDA COUNTY CLERK

Dublin Transit Center Parking Garage Project

CEQA Addendum

Prepared for:

County of Alameda - General Services Agency

May 2019

ENDORSED
FILED
ALAMEDA COUNTY

JUN 13 2019

MELISSA WILK, County Clerk
By ________ Deputy

19-372

Lamphier-Gregory

Dublin Transit Center Parking Garage Project

CEQA Addendum

Prepared for:

County of Alameda - General Services Agency

May 2019

Lamphier-Gregory

DTC EIR Addendum

County of Alameda GSA Dublin Transit Center Parking Garage Project

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DTC EIR Addendum

County of Alameda GSA Dublin Transit Center Parking Garage Project

Project Information

1. Project Title:	Dublin Transit Center Parking Garage Project
2. Lead Agency Name and Address:	County of Alameda General Services Agency 1401 Lakeside Drive, Suite 800 Oakland, CA 94612
3. Contact Person and Phone Number	Bernadette Delgado Medical Capital Program Manager County of Alameda General Services Agency 1401 Lakeside Drive, Suite 800 Oakland, CA 94612-4305 (510) 208-9590
4. Project Location	The Project is located on a 2.46-acre vacant parcel of land in the City of Dublin and within the project area of the Dublin Transit Center (APN: 986-34-13-1), The site is bounded by Campus Drive on the east, the Dublin/Pleasanton BART Parking garage and I-580 on the south, Iron Horse Parkway on the west and Martinelli Way on the north.
5. Project Sponsor's Name and Address:	County of Alameda General Services Agency (GSA) c/o Bernadette Delgado, Medical Capital Program Manager 1401 Lakeside Drive, Suite 800 Oakland, CA 94612 510/208-9590
6. General Plan Designation:	The Project site is designated Campus/Office on the City of Dublin General Plan Land Use Map.
7. Zoning:	The zoning designation for the Project site is Planned Development (PD) as provided in City of Dublin Ordinance 21-02.
8. Description of Project:	The Project would utilize the approximate eastern half of Parcel D-1 (the Project site) for a new 5-story freestanding public parking garage, providing approximately 570 parking spaces.
9. Surrounding Land Uses and Setting:	The Project site is located at the Dublin Transit Center, north of I-580 and the Dublin/Pleasanton BART station. The parcel is currently undeveloped. A three-story residential building

has been developed on the parcel immediately north of the site and a five-story mixed-use building has been developed on the parcel immediately west of the site. The existing Dublin/Pleasanton BART Parking Garage is adjacent to the south, and the lot to the east of the site remains a vacant undeveloped parcel (Parcel D-2 in the Dublin Transit Center plan) and plans have not been made for its future use. Topography of the site and nearby area is generally flat, and the site is secured with a chain link fence. Asphalt covers a portion of the site with the remainder being exposed soil and weeds.

10. Required Approvals:

The approval process is expected to include the following sequential steps:

a) **CEQA Compliance**: The Alameda County Board of Supervisors will review and consider the findings in this Addendum to the DTC Environmental Impact Report (EIR) and adopt the Addendum;

b) **Project Approval:** The Project requires approval by the Alameda County Board of Supervisors at a public hearing;

c) **Technical Reviews and** P**ermits:** Technical reviews will be made and permits issued by agencies and departments of the County of Alameda including for grading, excavation, building, structural, mechanical, electrical, plumbing and other permits, including compliance with the C.3 provisions of the San Francisco Regional Water Quality Control Board, and verified by third party plan check and permit reviewers;

d) **Project Implementation:** The County of Alameda General Services Agency (GSA) will prepare a "basis of design" document for a design/build contract to be awarded on a best value basis for delivery of final design and construction of the parking structure. GSA will coordinate reviews and inspections by appropriate County agencies during the construction process.

11. Other Public Agency Approvals:

The Project is jointly sponsored by the County of Alameda and the Livermore Amador Valley Transit Authority (LAVTA). Approval by LAVTA is required following completion of the environmental review process pursuant to CEQA.

Project Description

The following provides a brief background, describes the Project's location and surrounding land uses, provides details on the Project's components, and describes the subsequent processes necessary to implement the Project.

Background

The Dublin Transit Center (DTC) is a planning document that was adopted by the City of Dublin and incorporated as an amendment to the Eastern Dublin Specific Plan and the City's General Plan. The DTC defines allowable and anticipated land uses and development intensities within an area of approximately 91 acres located immediately north of the East Dublin/Pleasanton BART station. Land area covered by the DTC was previously owned by the U.S. Army, as part of the Camp Parks Reserve Forces Training Area. As part of a land exchange between the Army, the East Bay Regional Park District and the County of Alameda, the Alameda County Surplus Property Authority (ACSPA) received approximately 35 acres and the City of Dublin received the right-of-way for Dublin Boulevard in 1994. The ACSPA subsequently deeded 15 acres to BART for construction of the Dublin Pleasanton BART station, which opened in 1995. In 1997, the Army transferred the balance of the DTC area between Iron Horse Parkway and Arnold Road to the ACSPA. In 2000/2001, Dublin Boulevard was relocated and constructed as a six-lane arterial street between Iron Horse Parkway and Hacienda Drive to the east, and additional interim BART parking was constructed just west of DeMarcus Boulevard on ACSPA property. **Figure 1** is an aerial photograph showing the DTC area as it existed in 2002.

In 2002, the Dublin City Council approved the DTC project and certified the DTC EIR. The approvals included amendments to the City's General Plan and to the Eastern Dublin Specific Plan. These approvals established the land use and development standards for:

- up to 1,500 residential units on properties designated as Sites A, B and C;
- up to 2 million square feet of Campus/Office uses on Sites D-1, D-2, E-1 and E-2;
- up to 70,000 square feet of ancillary retail uses to be dispersed between Sites B. C. D-1 and E-1;
- approximately 8.7 acres of Neighborhood Parks, and
- 7.9 acres of Public/Semi-Public uses, including the BART parking structure and surface parking lots for BART patrons and BART employees.

The Sites and land uses referenced above are shown on **Figure 2**. Site F has since been removed from the DTC project.

Since certification of the Prior EIR in 2002, substantial portions of the DTC have now been developed (see **Figure 3**). Portions of Site A, and Sites B and C have been developed with high-density residential use, and Site E-1 (which was designed for Campus/Office use) has been developed with high-density residential use as well. Site D-1, D-2 and E-2, each designated for Campus/Office use, have remained vacant.

In 2007, BART's seven-level Phase 1 parking structure was constructed, providing 1,512 parking spaces. BART's Plans for a 655-space Phase 2parking structure were prepared and BART intended to move forward with construction in 2016, but the Phase 2 parking structure has not been built.

Project Purpose and Need

The Project is intended to address an existing unmet demand to the surrounding Livermore, Amador Valley, and Dublin community for parking at the Dublin/Pleasanton BART Station. According to BART's 2016 Prior EIR Addendum document, all parking spaces at the Dublin/Pleasanton BART Station are at 100 percent occupancy, and are typically filled by approximately 7:30 AM. This limits the ability of additional BART patrons to access the regional transit system, reducing potential BART ridership and increasing vehicle commute traffic on Bay Area roadways as commuters forego transit for automobile travel. The purpose of the Project is to provide additional parking for BART patrons, including Ride Share and Vanpool vehicles, thereby improving access to the system.

During the years following construction of BART's Phase 1 parking structure, the adjacent D-1 parcel has remained vacant. Proposals for use of the site by private parties have not materialized, while the demand for additional parking for BART patrons has increased. The County, in partnership with the Livermore-Amador Valley Transit Authority (LAVTA), has taken steps to satisfy that unmet parking demand by using a portion of the D-1 site for a parking garage. According to their joint letter of application for funding submitted to the Office of State Transit Programs and Plans, the grant application seeks funding for:

> "*. . . a multi-level parking structure that will accommodate more than 500 transit riders daily and will include electric vehicle charging stations and preferred parking for van pools to further maximize utilization. This much-needed structure is located in a highly congested area and a critical transit center that includes BART, LAVTA, County Connection,[1], San Joaquin RTD[2] and Stanislaus Regional Transit(StaRT).[3] This structure will facilitate commuters, a significant portion of which come to this transit center from disadvantaged communities, that are seeking to utilize these transit options, but are often denied due to a lack of parking capacity as early as 7:30am at the BART station. The parking structure will be constructed on a 2.46-acre parcel of County of Alameda owned land adjacent to the BART station*."[4]

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[1] County Connection was formed in 1980 as a Joint Powers Agency under the legal name The Central Contra Costa Transit Authority. County Connection provides fixed-route and paratransit bus service throughout the communities of Concord, Pleasant Hill, Martinez, Walnut Creek, Clayton, Lafayette, Orinda, Moraga, Danville, San Ramon and unincorporated communities in Central Contra Costa County.

[2] San Joaquin Regional Transit District isa transit district that provides bus service to the city of Stockton, California and the surrounding communities of Lodi, Ripon, Thornton, French Camp, Lathrop, Manteca, and Tracy.

[3] StaRT is the Stanislaus Regional Transit service which provides early morning commuter bus service from the cities of Turlock and Patterson to the Dublin/Pleasanton BART station.

[4] Livermore Amador Valley Transportation Authority, *Transit and Intercity Rail Capital Program Application,* January 2018, included herein as **Appendix A**.

The County's funding proposal, submitted in partnership with the Livermore Amador Valley Transit Authority (LAVTA), was given preliminary approval in April 2018. That approval forms the basis for the County's current efforts to move forward and complete the environmental review process for the Project as required by CEQA.

Project Location and Surrounding Uses

Project Location

The Project site is located in the City of Dublin, north of I-580 and northeast of the Dublin/Pleasanton BART Station, as shown in **Figure 4.** Local roadways in the Project vicinity include Dougherty Road to the west, Dublin Boulevard to the north, and Arnold Road and Hacienda Drive to the east. The Project site is located on Site D-1 within the DTC, as shown in **Figure 5.**

Historically, the Project site and surrounding areas were used as a dump and salvage yard affiliated with the Camp Parks Reserve Forces Training Area, which was constructed in the early 1940s. In the years since military use ended, buildings have been cleared and the area remained largely unused and vacant until the Dublin/Pleasanton BART station opened. Other surrounding parcels within the DTC area have developed during a 2006-2008 development period, and again during a 2014-2016 development period.

Land uses surrounding the Project site include:

- To the east is undeveloped land (Site D-2), designated for Campus/Office use
- To the south is the BART parking structure and I-580, and to the southwest is the Dublin/ Pleasanton BART station platform
- To the west is a medium-density residential development, and
- To the north is a medium density residential development

Project Site

The Project site is currently undeveloped and fenced off along its perimeter to prevent public use or access. Aside from asphalt paving located on the western half of Site D-1, the balance of the Project site is predominantly bare soil and low-lying weedy vegetation. Streets surrounding the site include Iron Horse Parkway, Campus Drive (unimproved) and Martinelli Way. Campus Drive has been partially improved from Altimirano to the northerly edge of the BART parking structure; the Project will complete the construction of Campus Drive from Martinelli Way to Altimirano which is necessary to provide access to the garage.

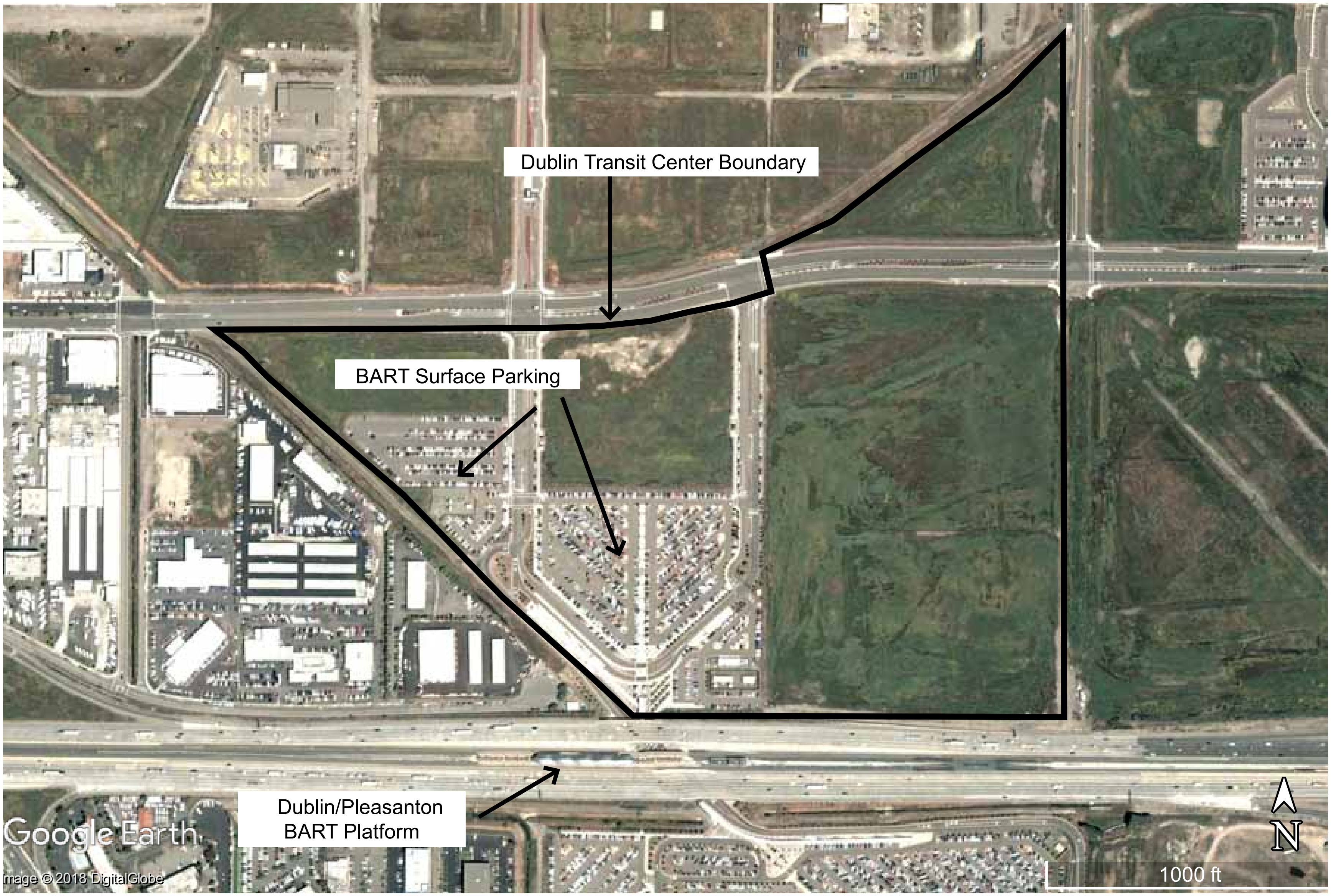


Figure 1
DTC Area as it Existed in 2002

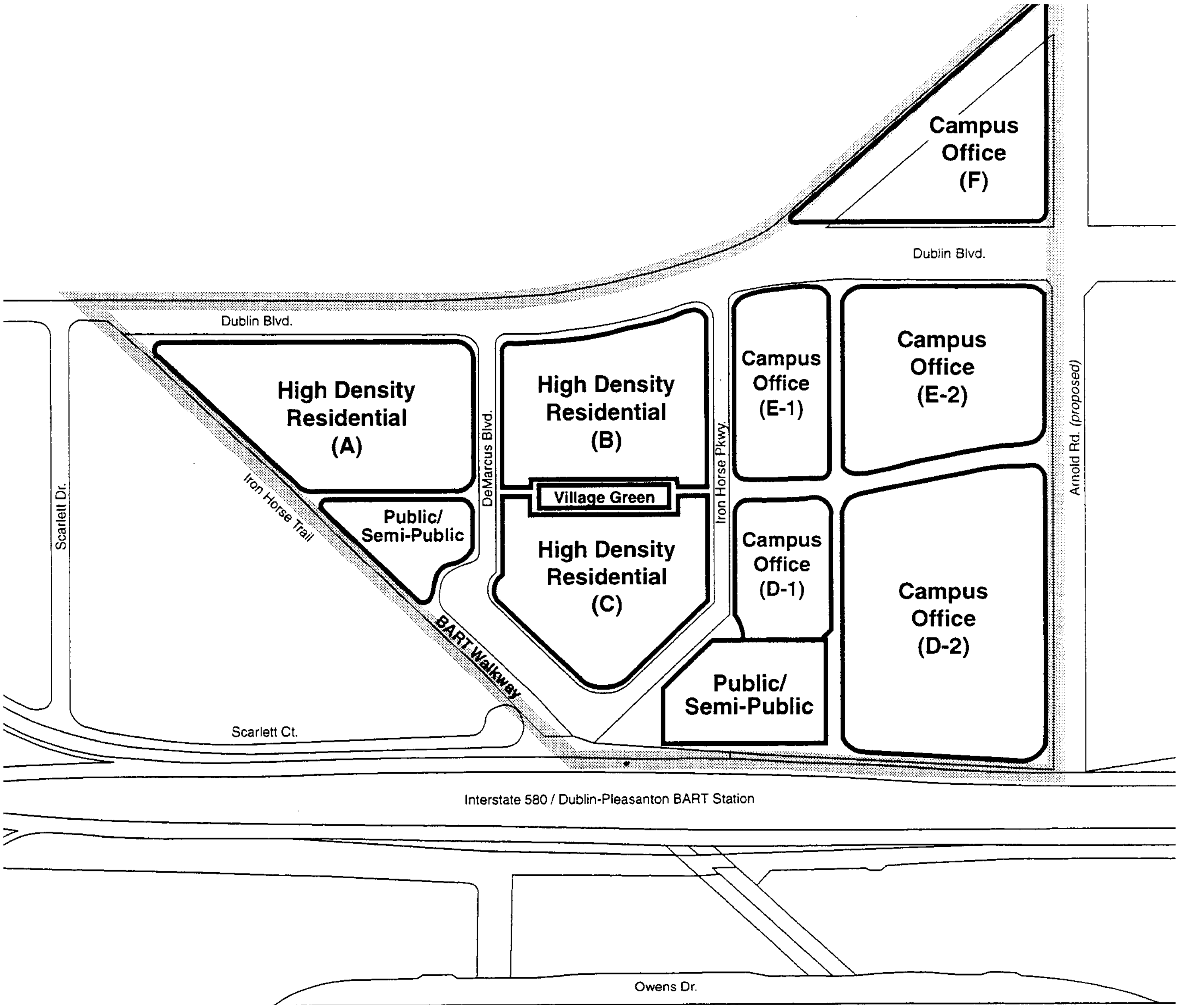
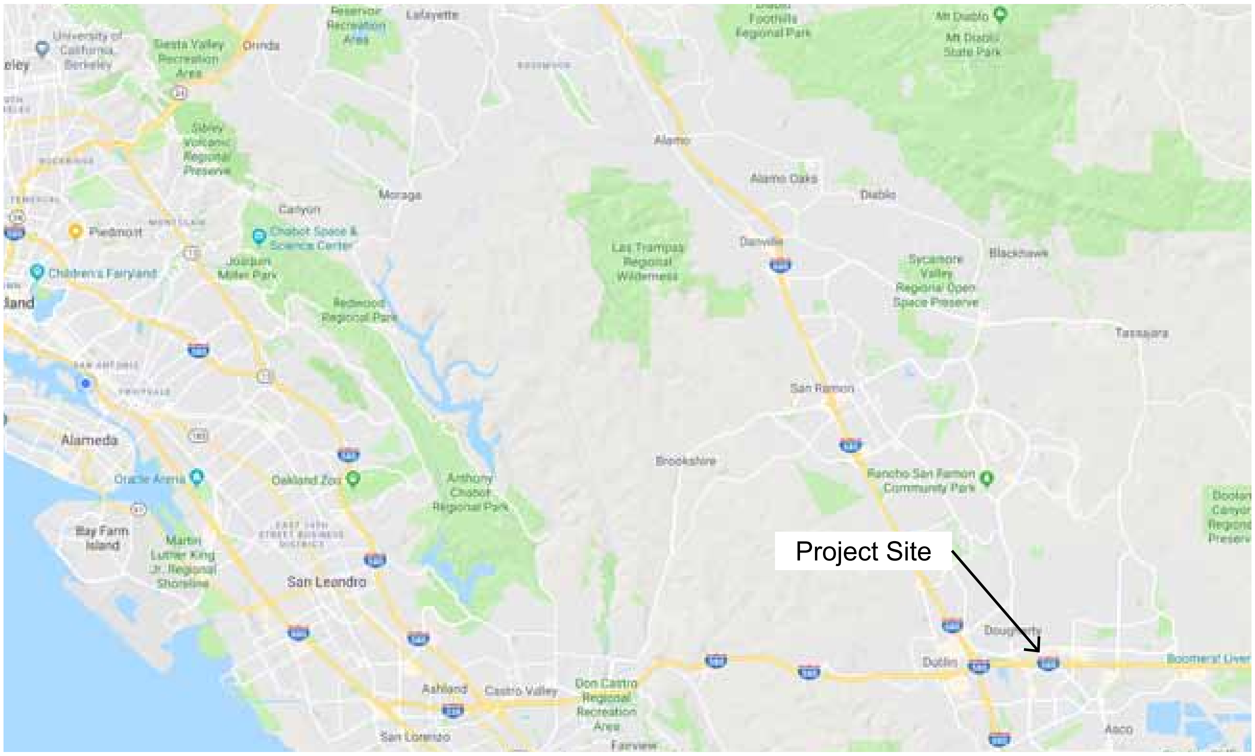


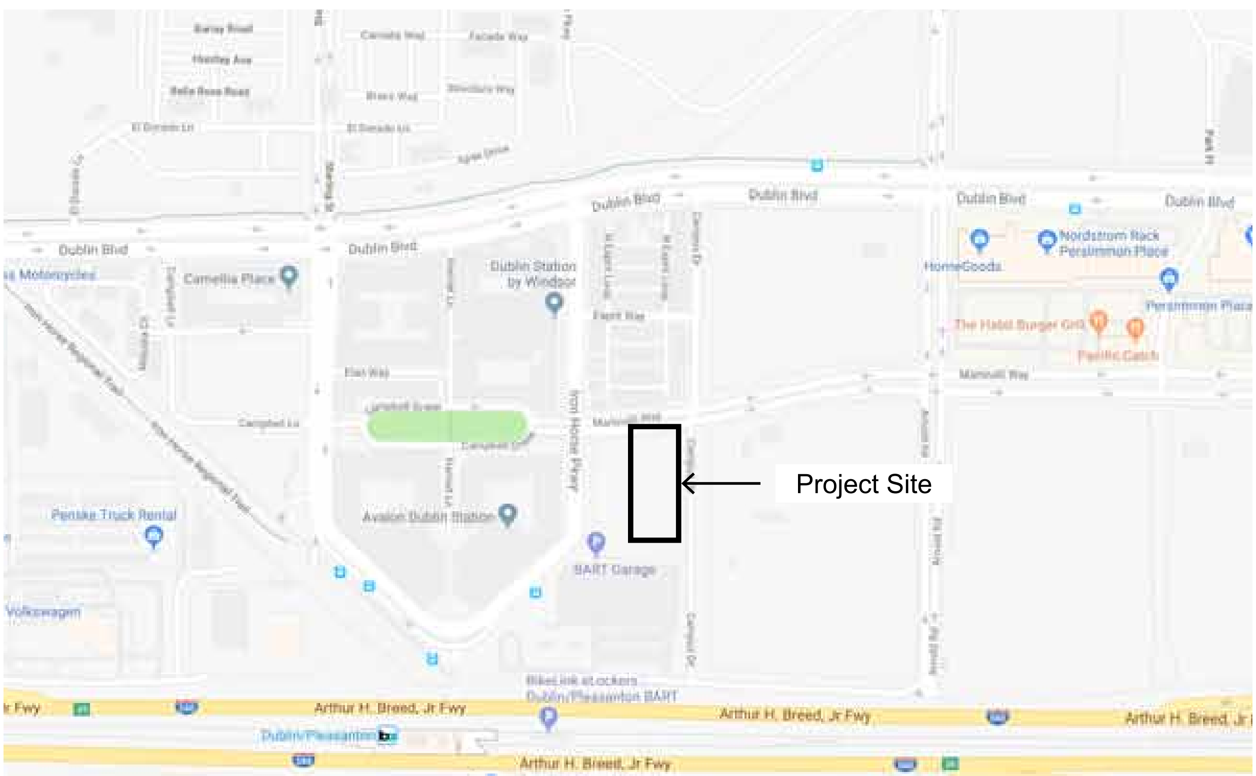
Figure 2
Dublin Transit Center Land Use Plan

DTC EIR 2002, Exhibit 4

Figure 3
Current Development within the DTC Area



Regional Location



Project Site

Figure 4
Regional Location and Project Site

Figure 5
Site Context

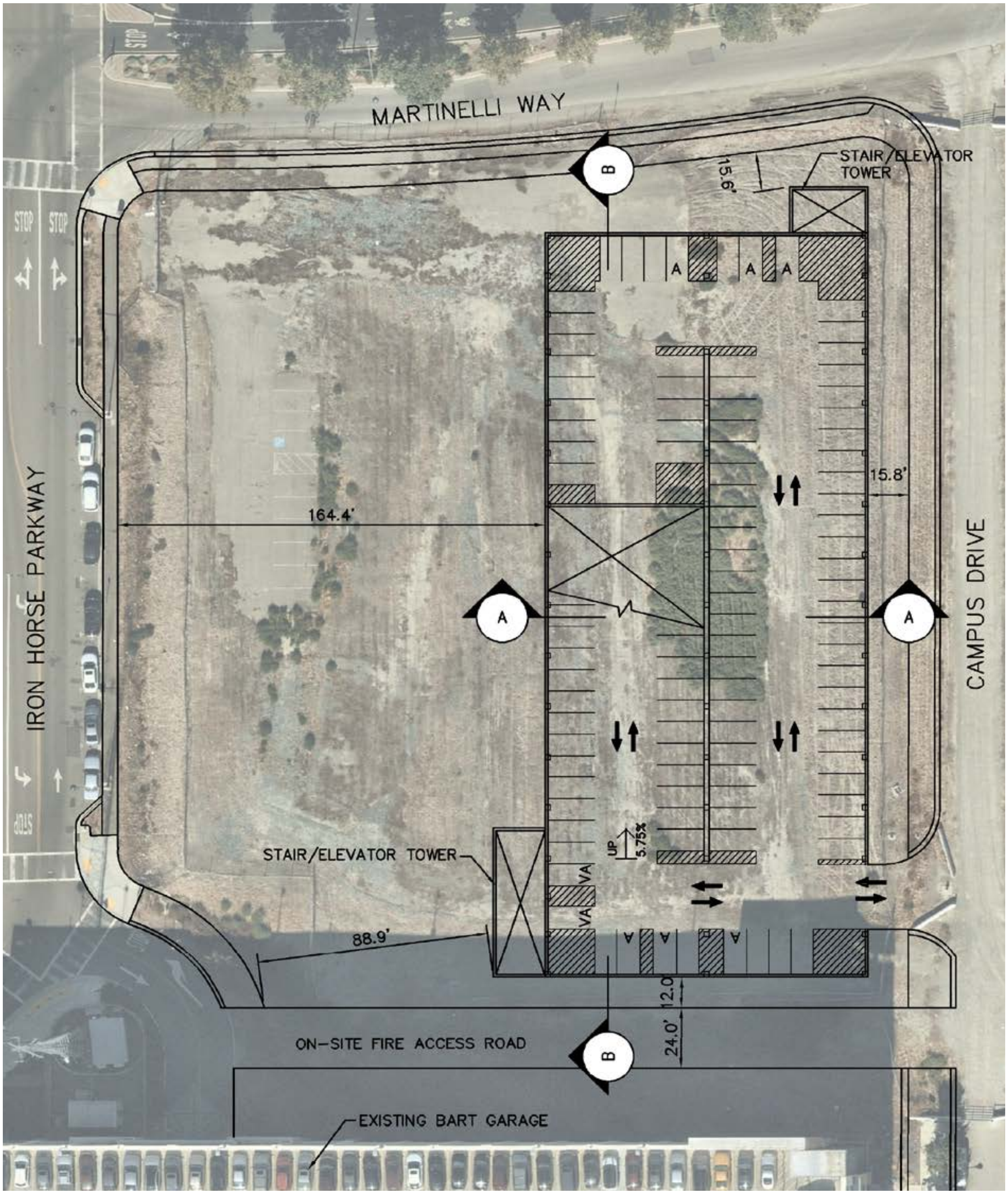
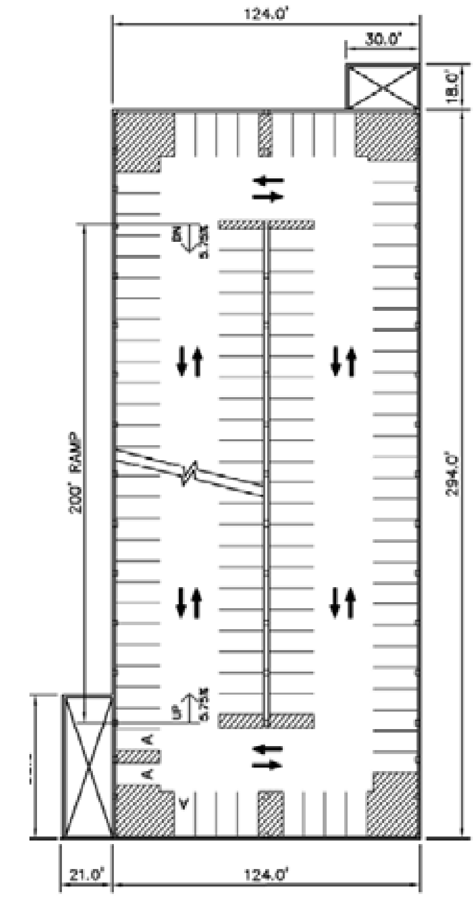
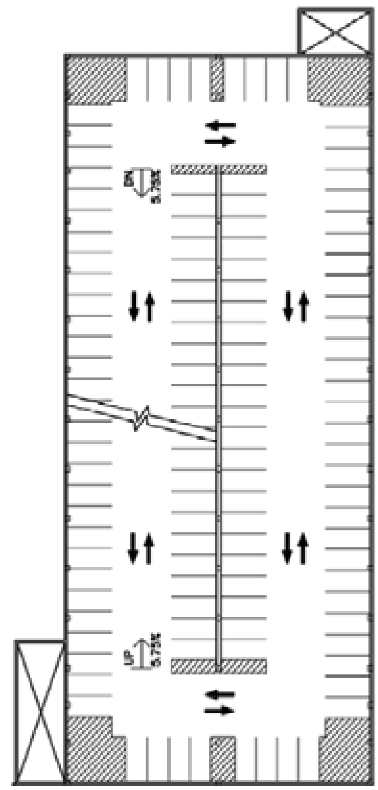


Figure 6
Project Site Plan (Preliminary)

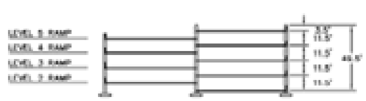
Source: Alameda County GSA



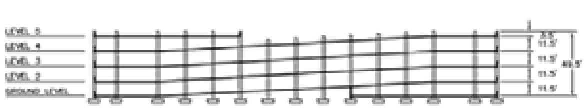
SECOND LEVEL PLAN



THIRD & FOURTH LEVEL PLAN



SECTION A–A



SECTION B–B

PARKING STALL COUNT

LEVEL	STANDARD SPACES (8'–6"X18')	ADA SPACES	TOTAL SPACES	AREA (SF)	EFFICIENCY (SF/STALL)
GROUND	96	8	104	34016	327
LEVEL 2	116	3	119	36456	306
LEVEL 3	120	0	120	36456	304
LEVEL 4	120	0	120	36456	304
LEVEL 5	107	0	107	33970	317
TOTAL	559	11	570	177354	311

NOTE:
1. PARKING STALL COUNTS HAVE NOT BEEN REDUCED TO ACCOUNT FOR LOSS OF SPACES DUE TO BICYCLE/MOTORCYCLE PARKING, OR THE PLACEMENT OF MECHANICAL/UTILITY ROOMS.
2. ADJACENT BART GARAGE UTILIZES 8'–4" X 19' STALLS.

Insert Figure Label Here

Figure 7
Garage Plans, Sections and Parking Space Calculations

Source: Alameda County GSA

Project Details

The Project involves the design, construction and operation of a new, freestanding public parking garage intended to help meet the need for additional off-street parking to support of the Dublin/Pleasanton BART station. The Project would be a 5-level public parking structure with approximately 570 parking spaces, occupying the easterly half of the 2.46-acre D-1 Site within the DTC. Initial schematic plans for the structure indicate that access will occur from Campus Drive at the southeast corner of the parking structure (see **Figures 6 and 7**). Internal circulation would be via a 2-way drive aisle and ramps accessing the upper floors. No existing surface parking spaces would be removed to accommodate the Project.

Parking Structure

The County intends that the final design of the parking structure will be prepared as part of a design/build method of delivery contract, which would be awarded on a best value basis once the CEQA process has been completed. Consequently, final design details are not known at this time. The preliminary concept plan shown in **Figure 6** indicates the basic dimensions of the structure as being 294 feet long by 124 feet wide, resulting in a 36,456 square foot (0.84 acre) footprint. Assuming 5-floors, this would result in gross floor area of approximately 177,354 square feet, reaching a maximum height of 55 feet. The materials and appearance of the exterior of the structure have not been determined. It is expected that the structure will be open at the sides, allowing natural ventilation throughout and avoiding the need for heating, cooling or other mechanical ventilation. Floor to floor heights are expected to be 14.5 feet on the ground floor and 9 feet on all upper floors. The higher ground floor height would allow possible conversion of that floor area to other uses in the future, such as retail or residential.

Bicycle Parking

The Project will provide approximately 28 secured bicycle parking or storage spaces, consistent with the City of Dublin Zoning Ordinance and California Green Building Standards. The precise location and final number of the bicycle spaces will be determined during the design/build process.

Landscaping and Lighting

The final design for the Project will include landscaping with water conservation features around the structure perimeter, although no preliminary landscape plan has been prepared. The Project would also include new lighting at the garage for circulation and safety. The Project does not yet include a lighting plan.

Operation

The parking garage will be designed for unmanned operation, with onsite staff for facility management, and will be open to the public seven days a week, 24-hours a day. Access would be controlled by electronic sensors that would control a ticket dispenser and electronic gate arm, and the equipment for cashless payment of parking charges. Details regarding hourly, daily or weekly charges for use of the garage have not been determined.

Project Construction

Construction of the Project will extend over an approximate 12-month period beginning in 2020. Construction work hours would be 7:00 AM to 7:00 PM weekdays. Nighttime work is not anticipated.

During construction, the Project would create temporary jobs for approximately 30 construction workers.

Since the Project site is flat and level, no major grading efforts will be required. Excavation equipment will remove existing surface vegetation and the top 18" to 24" of surface materials. Trenching would occur for placement of underground utilities and for connections to existing storm drain infrastructure. The surface area that would be disturbed during construction would total approximately 1.5 acres including the Project site itself plus Campus Drive, the fire access road separating the garage from the adjacent BART parking structure, and frontage improvements along Martinelli Way. Excavation for the garage structure would generate approximately 2,700 cubic yards of material to be excavated and hauled off-site.

The garage structure will consist of a post-tensioned poured-in-place concrete structure supported by perimeter grade beams and a mat foundation, the details of which are to be determined by the selected design/build contractor. Access to the garage will be provided by construction of Campus Drive at the southeast corner of the structure. In the final stages of construction, new sidewalks and landscaping will be installed immediately surrounding the site including frontage improvements along Martinelli Way.

The vacant remainder portion of the D-1 site immediately west of the Project will be used as a staging area for construction equipment, supplies, materials and possibly field offices.

Project Approvals

The County of Alameda, acting through the County of Alameda General Services Agency (GSA), is the Project sponsor for the Project, and responsible for its implementation. The County of Alameda is also the lead agency for CEQA review, and the public agency with the greatest roles and responsibilities for carrying out the Project. A three-step approvals process is anticipated, as follows:

Step 1: CEQA Compliance / Project Approval

Pursuant to CEQA, the County Board of Supervisors will consider the information and findings of this Addendum to the DTC EIR and will include CEQA findings in the Board Resolution used to adopt the Addendum . A separate resolution will be used for approval of the Project. If the Project is approved, legal title to the D-1 site will be transferred to the County of Alameda from the ACSPA. The County will then assign the D-1 site to the Project and will begin to prepare a basis of design document for a design/build contract to be awarded on a best value basis for delivery of final design and construction of the parking structure.

Step 2: Technical Approvals

Other agencies and departments of the County of Alameda will be responsible for review and approval of all plans and specifications normally required for grading and excavation, building, structural, mechanical, electrical, plumbing and other permits, including compliance with the C.3 provisions of the San Francisco Regional Water Quality Control Board. These subsequent administrative permits may be verified by third-party plan check and permit reviewers.

Step 3: Construction Administration

Implementation of the Project through final design and construction phases would involve on-going project management and oversight by the County of Alameda GSA. The GSA will coordinate reviews and inspections throughout the construction process by appropriate County agencies (e.g., Public Works Department) for compliance with adopted site grading, structural, electrical, mechanical, plumbing building, drainage and clean water standards and requirements.

City of Dublin Involvement

Beginning in the mid-1980s, the County of Alameda and the City of Dublin have executed several agreements regarding land use and the terms under which the properties acquired by the County from the federal government would be annexed into the City of Dublin. The first of these agreements was executed in 1986 and was known as the Annexation Agreement. It identified five sub-areas: the Camp Parks Property, the Tassajara Park Property, the County Governmental Property, the County Sheriff Property, and the Santa Rita Property. The Alameda County Surplus Property Authority (ACSPA) was created by the County to oversee and carry out the County's intentions with regard to these properties. The Camp Parks Property includes the properties that comprise the Dublin Transit Center and the Project site.

The 1986 Annexation agreement was amended in 1992[5] when the parties agreed to a refinement of the terms and conditions regarding the various properties. Among other matters, the 1992 Amendment addressed the City's role in land use approvals on County-owned property proposed for annexation to the City of Dublin. It provided that, with regard to development projects proposed on County owned land, "…the County shall comply with all City rules, regulations, resolutions, ordinances or other enactments relating to land use including, but not limited to, City general plan, any applicable specific plan, Municipal Code, Zoning Ordinance, Building Code, Electrical Code, Mechanical Code and Housing code."[6]

However, and to facilitate the processing of the GSA garage project, the Dublin City Council, by resolution adopted in May 2018, authorized the City Manager to enter into an agreement with the County that would waive, in part, the site development review process, otherwise applicable pursuant to the 1992 Agreement, and would agree to process the facility in a consultation role. The resulting agreement that was negotiated between City and County staff (the "Letter Agreement")[7] limited the

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[5] Agreement Between County Of Alameda Surplus Property Authority And City Of Dublin Regarding Transfer Of Property Tax Revenues Upon Annexation Provision Of Services And Other Matters, effective as of October 6, 1992.

[6] Ibid, p. 13.

[7] Agreement for Submittal, Review and Construction of the Alameda County Dublin Transit Center Parking Garage ("Letter Agreement"), dated April 9, 2019, signed by the Director of the Alameda County GSA and the City Manager of the City of Dublin.

City's role in of the garage project to review and comment on design aspects of particular concern to the City.

The Letter Agreement requires the County to "…provide the City with a reasonable opportunity to review and comment on elevations, site plan, site access, lighting, and landscaping that are prepared as part of the County's bridging package that will be submitted to the design/build contractor for the Garage project. The City will have 15 business days to submit its comments to GSA regarding these items." The specific items of concern to the City listed in the Letter Agreement were:

- Site layout must ensure that any remainder parcel is developable. The project design and construction should be compatible with future subdivision potential to facilitate development of any remainder parcel. For example, any required setbacks (building code, fire code, zoning code, etc.) should be considered.
- Ensure adequate queuing of vehicles entering the garage to reduce impacts to the roadway network.
- Place more emphasis on architectural treatment of the Martinelli Way and Campus Drive elevations.
- Create strong architectural element on the corner of the garage at Martinelli Way and Campus Drive.
- Ensure compatibility and reduce conflicts with any future development of the western portion of the parcel. This may include a solid wall or other methods to reduce sound and light impacts (both garage lighting and vehicle headlights) to future residential project. Similarly, consider impacts to the existing residences at Esprit which is located to the north across Campus Drive.
- Ensure that lighting on the top deck of the garage is designed to minimize impacts to existing and future development surrounding the site (including potential future residential development of the remainder of Site D and also the existing Esprit residential project). This may include reduced height for light standards, moving light standards to the center of the garage, and using light shields, or incorporating low level lighting such as bollards, etc.
- Submit signage and wayfinding that is external to the garage for review.
- Street improvements are required on Iron Horse Parkway, Martinelli Way, and Campus Drive. Improvements shall be consistent with the Transit Village Center standards in the Eastern Dublin Specific Plan and compatible with the existing street improvements on adjacent property frontages. Standards include colored concrete sidewalks with integrated paver bands, tree wells with grates, specific street light fixtures, and potentially pedestrian scale lighting. Street improvements are subject to review, approval, and permitting by the City of Dublin.
- The project is required to comply with the Municipal Regional Stormwater NPEDES Permit (MRP) and implement low impact development (LID) stormwater treatment, hydromodification management (HM), and stormwater trash capture. It is critical that LID, HM, and trash capture is considered early in the design.

- An Encroachment Permit will be required for construction within or use of the public street rights-of-way. Traffic control plans, prepared in accordance with current MUTCD standards, are subject to review and approval by the City.
- The project site is located in a Seismic Hazard Zone, according to maps released by the State of California. The project shall be designed and constructed in accordance with the Seismic Hazard Mapping Act.

By the terms of the Letter Agreement, the County can approve and proceed with implementation of the Project without formal approvals from the City of Dublin (e.g., a General Plan amendment or rezoning process) that would otherwise be required in the absence of such Letter Agreement. Thus, the City acknowledges that the parking garage Project is an acceptable land use for the eastern portion of the D-1 Site and does not require an amendment to the City's General Plan, the Eastern Dublin Specific Plan or the Dublin Transit Center plan. The Letter Agreement provides the City with meaningful opportunity to comment on the design and exterior appearance of the Project before architectural details are finalized. Through the terms of the Agreement, the City can effectively participate in design review of the Project to ensure the City's concerns are addressed.

CEQA Documentation

Introduction

This document is based on Section 15162 and 15164 of the CEQA Guidelines, and serves as an Addendum to the *Dublin Transit Center Final Environmental Impact Report,* which was certified by the City of Dublin in 2002.[8] Information presented in this document has also been taken from the 2012 BART Addendum. The County of Alameda, acting through its General Services Agency (GSA), is the Lead Agency for this Project. This Addendum analyzes a proposed parking garage (the "Project") that is proposed by the County of Alameda on Surplus Property-owned land adjacent to the existing BART parking structure at the East Dublin/Pleasanton BART station. The Project is located within the Dublin Transit Center in the City of Dublin.

CEQA Guidelines Section 15164 states that an addendum to a previously certified EIR shall be prepared when some changes or additions are necessary, but none of the conditions requiring preparation of a subsequent EIR pursuant to CEQA Guidelines Section 15162 have occurred. The analysis in the 2002 Prior EIR directly applies to the proposed Project, providing the basis for the use of an Addendum. The proposed Project does not present changed conditions to the extent a new EIR would be required under Section 15162 of the CEQA Guidelines.

Prior EIR

The Dublin Transit Center Environmental Impact Report (the "Prior EIR") was certified by the City of Dublin in 2002. The Prior EIR assessed the potential environmental effects of the Dublin Transit Center, a

[8] City of Dublin, *Dublin Transit Center Project EIR*, Draft EIR dated July 2001 and Final EIR dated September 2002

91-acre high-density mixed-use development located directly north and east of the East Dublin/Pleasanton BART station in Dublin, California. At that time, the Surplus Property Authority of the County of Alameda (ACSPA) owned or controlled the entire project area. The Prior EIR included environmental review for a project that required an amendment to the Eastern Dublin Specific Plan and City of Dublin General Plan, a Stage 1 Planned Development rezoning, a parcel map, and a development agreement to provide a basis for future project-specific entitlements.

The Prior EIR describes existing environmental conditions within and adjacent to the proposed development and assesses the potential environmental effects of the proposed project. The Prior EIR also included measures to be incorporated into future development projects to mitigate anticipated environmental impacts. The Prior EIR also identifies and analyzes feasible alternatives to the proposed project, cumulative impacts and other mandatory elements as required by CEQA.

The Prior EIR is a Program EIR pursuant to Section 15168(a)of the CEQA Guidelines, in that it describes general impacts and mitigation measures applicable to the Specific Plan/General Plan Amendment, the Stage 1 Planned Development Rezoning, as well as subsequent parcel maps and Development Agreement actions. Implementation of the Transit Center project requires a number of follow-on actions such as Stage 2 Planned Development Rezoning, Site Development Review, and other entitlements as consistent with the amended Eastern Dublin Specific Plan/General Plan. It was anticipated that additional environmental review would occur at each of these stages of the project, and that the Prior EIR would be used as the basis for any further environmental documentation.

Prior EIR Conclusions

The Prior EIR found that the DTC project would result in significant and unavoidable impacts related to air quality and traffic. Emission of criteria pollutants during operation were found to have significant and unavoidable impacts on regional air quality, and no mitigation measures capable of reducing this impact was identified as feasible. The Prior EIR also found that significant and unavoidable traffic impacts would occur, specifically:

- Intersection levels of service would exceed threshold levels at two intersections – Dougherty Road/Dublin Boulevard and Hacienda Drive/I-580 westbound off-ramp
- Dublin Boulevard and Dougherty Road would experience congested conditions that would exceed the threshold of significance, and
- The I-580 mainline freeway would experience traffic volumes would exceed thresholds of significance

A Statement of Overriding Considerations was adopted as part of the City's approvals, recognizing that the DTC project would result in significant unavoidable impacts.

The Prior EIR determined that the DTC project's impacts related to a number of additional environmental topics would be reduced to a less-than-significant levels with the implementation of mitigation measures identified in that EIR. Environmental topics for which mitigation measures were identified and ultimately adopted by the City of Dublin pertain to:

- aesthetics

- biological resources
- cultural resources
- hazards and hazardous materials
- hydrology and water quality
- geology, soils and seismicity
- noise, and
- public services and utilities

The Prior EIR remains relevant and retains informational value for evaluation of the proposed Project.

2016 BART Addendum to the Prior EIR

In 2016, BART (acting as Lead Agency) prepared the *Dublin/Pleasanton BART Garage Expansion Addendum to the DTC EIR* to evaluate the potential environmental effects of BART's proposed implementation of a Phase 2 parking structure expansion.[9] Given the passage of time since the 2002 certification of the DTC EIR, this Addendum analyzed the proposed Phase 2 parking structure to verify that no changes in circumstances or new information would result in new or substantially more severe impacts from implementation of that project.

The 2016 BART Addendum used the 2016 CEQA Guidelines Checklist to evaluate potential project-specific environmental effects, and compared the proposed Phase 2 garage project to existing environmental conditions using current CEQA analysis methodologies. The Checklist evaluated whether impacts of that project were adequately covered by the Prior EIR and whether any of the conditions triggering supplemental environmental review had occurred. The analysis demonstrated that preparation of an Addendum to the Prior EIR was appropriate for that project, that no substantial changes to the affected environment would occur, and that no new or substantially more severe impacts would occur that had not already been identified in the Prior EIR.

Although the 2016 BART Addendum was prepared for a separate project (which has not been constructed), that document is relevant to this analysis because of the similarities between the two projects:

- both projects are parking garages (the BART Phase 2 garage at 655 parking spaces, and the Project at approximately 570 parking spaces)
- both projects are located in similar locations (the BART Phase 2 garage immediately south of the existing BART garage, and the Project immediately north)
- both projects are intended to serve a similar purpose (to supplement existing parking at the existing BART garage to facilitate access to and use of the regional BART transit system)

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9 San Francisco Bay Area Rapid Transit District (BART), *Dublin/Pleasanton BART Garage Expansion Addendum*, December 2016

Because of these similarities, there is relevant information and analysis in the 2016 BART Addendum that can be relied on for purposes of analysis of the Project.

Conditions for an Addendum

Section 15164 of the CEQA Guidelines provides that a lead agency, "shall prepare an addendum to a previously certified EIR if some changes or additions are necessary, as long as none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred". Section 15162 states that:

"*When an EIR has been certified or a negative declaration adopted for a project, no subsequent EIR shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in the light of the whole record, one or more of the following:*

1. *Substantial changes are proposed in the project which require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;*
2. *Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;*
3. *New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified, shows any of the following:*
   a) *The project will have one or more significant effects that were not discussed in the previous EIR or negative declaration*
   b) *Significant effects previously examined will be substantially more severe than shown in the previous EIR*
   c) *Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative, or*
   d) *Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative*"

Changes to the Project

The Prior EIR identified the Project site as Site D-1, one of several properties owned by the Surplus Property Authority of the County of Alameda (ACSPA) that comprised the bulk of the DTC project area. Site D-1 is located at the southeast corner of Iron Horse Parkway and Martinelli Way, and is designated as Campus/Office use pursuant to the DTC Plan. The Prior EIR assumed the D-1 Site as a future office use, developed at a gross floor-area-ratio (FAR) of 1.12, resulting in a ten-story building with 170,000 square feet of office use. Alternatively, a hotel of similar scale was considered. Site D-1 was planned as a location where future development could take advantage of proximity to the BART station and its adjacent parking garage to support and enhance use of transit and shared parking resources.[10] No development of Site D-1 has occurred since certification of the Prior EIR and the site remains a vacant 2.4-acre parcel.

Since certification of the Prior EIR, Phase 1 of an anticipated two-phase BART parking garage has been constructed adjacent to the East Dublin/Pleasanton BART station. The Phase 1 BART parking garage is currently in operation, and contains 1,512 parking spaces. Plans for a 655-space, Phase II parking structure expansion were prepared and an Addendum to the Prior EIR for that Phase 2 garage was adopted in 2016,[11] but the Phase 2 parking garage has not been built. The current demand for parking by BART patrons exceeds the available parking supply in the Phase 1 BART garage building (the BART parking garage is typically filled by 7:30 AM each weekday). Therefore, the County of Alameda sought and obtained preliminary funding approval from the 2018 Transit & Intercity Rail Capital Program to construct a parking garage on a portion of Site D-1.

The County of Alameda, acting through its General Services Agency (GSA), intends to use the eastern half of Site D-1 for a 5-story parking garage that would provide approximately 570 spaces. This new parking garage would be in-lieu of office or hotel development as had been assumed in the Prior EIR. The remaining portion of Site D-1 would remain for future office, hotel or residential use.

The Project is consistent with the vision of the DTC in which high-density land uses, together with a substantial amount of off-street parking, would occur on sites close to the BART station. The design of the Project (i.e., using half of the D-1 site for a parking garage) would reduce but not eliminate the potential for office, hotel or residential development on the remaining half of the site. The Project represents a modification of the DTC Plan in terms of how Site D-1 is used, but is otherwise consistent with the broader vision of high density, transit-oriented development surrounding and anchored by the BART station. No other changes to the DTC as considered in the Prior EIR are proposed except to replace Campus/Office use on the eastern half of the D-1 site with a Public/Semi Public use that would consist of the proposed public parking garage.

The purpose of this CEQA document is to evaluate the potential environmental effects of the proposed changes to the land uses originally contemplated for the subject site as a modification to the DTC project as analyzed in the Prior EIR and the 2016 Addendum, and determine whether the conditions requiring supplemental CEQA review are present.

Summary of Addendum

In accordance with CEQA Guidelines Sections 15162 and 15164, and as set forth in the CEQA Checklist below, the Project qualifies for an addendum to the Prior EIR because the following findings can be made:

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[10]Dublin Transit Center EIR, p. 9

[11] Dublin/Pleasanton BART Garage Expansion Addendum, December 2016

- The analyses conducted and the conclusions reached in the Prior EIR certified by the Dublin City Council on November 19, 2002 remain valid.
- The proposed Project would not cause new significant impacts not previously identified in the DTC EIR, or result in a substantial increase in the severity of previously identified significant impacts. No new mitigation measures would be necessary to reduce significant impacts.
- No changes have occurred with respect to circumstances surrounding the DTC that would cause significant environmental impacts that the Project would contribute toward, and there is no new information that shows that the Project would cause significant environmental impacts.

Effects Resulting from Changes to the Project

The Project would reduce potential future Campus/Office land uses near the BART station by using a portion of the D-1 Site for a 5-level parking garage. The proposed change in land use would not result in new environmental impacts not previously addressed in the Prior EIR, nor would it have impacts that increase the severity of previously identified impacts. The proposed change in land use would result in reduced criteria pollutant and GHG emissions due to a reduction in vehicle miles traveled (VMT). Additional parking near the BART station would facilitate use of transit for access to job centers and other land uses, and reduce the reliance on cars for such access.

Potential New or More Severe Impacts

This analysis does not identify any substantial changes to the affected environment as resulting from the Project, and does not identify any new or substantially more severe impacts not already identified in the Prior EIR. The Project would substitute an approximately 570-space public parking garage on a portion of the D-1 Site previously assumed in the Prior EIR as the location for a future 170,000 square foot, 10-story office or hotel development. The environmental effects of the assumed office or hotel development were evaluated in the Prior EIR, and the Project would not result in any new or greater environmental effects than were identified in the Prior EIR. Topics that were not considered at the time of the Prior EIR (e.g., greenhouse gas emissions) have been included in this Addendum document to confirm the absence of new environmental impacts.

New Information or Changed Circumstances

The Project site and surrounding area are substantially the same as described in the Prior EIR, with the exception of new development that has occurred consistent with DTC project evaluated in the Prior EIR. New, project-specific analysis included in this Addendum confirms that the Prior EIR remains relevant and its analysis, impacts and mitigation measures are still applicable and adequate.

Conclusion

Based on the following environmental evaluation, implementation of the Project requires some changes and additions to the Prior EIR but does not meet any of the conditions of Section 15162 otherwise requiring a Subsequent EIR. Based on the evaluation presented herein, there is no substantial evidence in the light of the whole record that the conditions outlined in Section 15162 of the CEQA Guidelines requiring preparation of a Subsequent EIR are met.

The analysis conducted in this Addendum demonstrates that preparation of an Addendum to the Prior EIR is appropriate for the Project, and serves as the basis for CEQA compliance. Therefore, an Addendum to the Prior EIR is appropriate and no further review or analysis under CEQA is required. This CEQA Analysis is the Prior EIR Addendum. This Addendum to the previously certified Prior EIR will be presented to the Alameda Board of Supervisors for its consideration and acceptance after which this Addendum will serve as the basis for the Project's compliance with CEQA.

Environmental Factors Potentially Affected

Environmental factors that may be affected by the Project are listed alphabetically below. Factors marked with a filled in block (■) have been determined to be potentially affected by the Project, involving at least one impact that has been identified as a "Potentially Significant Impact", as indicated in the attached CEQA Evaluation and related discussion that follows. Unmarked factors (□) were determined to be either not significantly affected by the Project, adequately examined under the Prior EIR, or fully mitigated through implementation of mitigation measures to be adopted by the County of Alameda as lead agency .

☐ Aesthetics	☐ Agricultural Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Geology/Soils
☐ Hazards/Hazardous Materials	☐ Hydrology/Water Quality	☐ Land Use/Planning
☐ Mineral Resources	☐ Noise	☐ Population/Housing
☐ Public Services	☐ Recreation	☐ Transportation/Traffic
☐ Utilities/Service Systems	☐ Mandatory Findings of Significance	

Determination:

On the basis of this initial evaluation:

> I find that changes are proposed as part of the Project that would involve revisions to the Previous CEQA Documents, changes have occurred with respect to circumstances under which the Project would be undertaken, and there is new information. However, none of these changed conditions involves new significant environmental effects or a substantial increase in the severity of previously identified significant effects. Only minor changes to the Prior EIR are required to address these changes in the Project, its circumstance and new information. Thus, an Addendum to the Previous CEQA Document is appropriate, and this document constitutes that Addendum.

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Name

____

Title

____

Date:

Evaluation of Environmental Impacts

Pursuant to CEQA Guidelines Section 15063, the following sections of this document provide an evaluation of whether the Project will have any new or more severe significant effects on the environment than were previously analyzed and disclosed in the Prior EIR. The significance thresholds used in this Checklist are from the Environmental Checklist found in Appendix G to the 2018 CEQA Guidelines, and are used to confirm that no new or substantially more severe impacts would occur as a result of the Project, as compared with those impacts identified in the Prior EIR.

- If an environmental issue would not be affected by the Project or its impact would be less-than-significant, it is identified in the following evaluation as "***No Impact*** / ***Less than Significant***".
- If an environmental issue may cause a significant effect on the environment, this evaluation also determines whether this effect was adequately examined in the Prior EIR. To the extent that mitigation measures were adopted pursuant to the Prior EIR and these measures are applicable to the Project, these measures are specifically identified. If the environmental issue was adequately examined in the Prior EIR and mitigation measures apply, it is identified in the following evaluation as "***Not a New Impact, Requires Mitigation from DTC EIR".*** All applicable mitigation measures from the 2002 Prior EIR are listed in **Appendix x.**
- If the Project would result in a new significant environmental effect or a substantial increase in the severity of previously identified significant effect, it is identified in the following evaluation as "***New of More Severe Significant Impact***" and would need to be analyzed in a Supplemental or Subsequent EIR.

I. Aesthetics Would the project:	New or More Severe Significant Impact	Not a New Impact, Requires Mitigation from DCT EIR	No Impact / Less than Significant
a) Have a substantial adverse effect on a scenic vista?	☐	☑	☐
b) Substantially damage scenic resources, including, but not limited to trees, rock outcroppings and historic buildings within a state or locally designated scenic highway?	☐	☐	☑
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☑
d) Create a new source of substantial light or glare that would substantially and adversely affect day or nighttime views in the area?	☐	☑	☐

Scenic Vistas

Prior EIR Conclusions

The Prior EIR found that the DTC would reduce existing views of Mount Diablo and the surrounding scenic ridge lands from certain public viewpoints including from westbound 1-580, the BART station platform, and along the Iron Horse Trail. This impact was found to be significant, requiring the following mitigation.

> **Mitigation Measure 4.1-1**: Include breaks and corridors between building clusters, especially along the north-south axis, so that some views of Mount Diablo are maintained, taking into account the need to block freeway noise and to create a compact transit-oriented development pattern.

Project Assessment

The Project will be constructed on the north side of the existing BART Phase 1 parking garage and will be lower in height and smaller in scale compared with the BART garage. The Project will not obscure views of scenic resources that are not already obscured by the BART garage. The Project will also be lower in height and scale as compared to the 10-story office project assumed for the D-1 site in the Prior EIR. The height of the Project will be limited not more than 50 feet and, consistent with **Mitigation Measure 4.1-1** of the Prior EIR, will retain a north-south orientation and will maintain the north-south alignment of Campus Drive as a corridor to minimize obstruction of distant views. The Project is lower in height and similar in orientation as compared to the assumed DTC office building or hotel at this site. The Project will not result in a new impact on scenic vistas, and will not substantially increase impacts on views of Mount Diablo or the surrounding ridgelines from public viewpoints as compared to the office project at this site as analyzed in the Prior EIR.

Damage to a Scenic Resources

Prior EIR Conclusions

The Prior EIR did not identify any trees, rock outcroppings, historic buildings or other scenic resources within the DTC or vicinity, and found no impact related to this topic.

Project Assessment

The Project site is a flat, graded site with no mature vegetation, structures or scenic resource value. Development of the Project will not result in a new impact to scenic resources, and this impact would remain less-than-significant.

Substantially Degrade Existing Visual Character

Prior EIR Conclusions

The Prior EIR concluded that the DTC would represent a major change in visual character from existing development in the vicinity (at the time). However, the "relative isolation of the DTC from other existing development and the DTC's urban design plan would limit the potential for this change to be considered negative." The 10-story office building onsite D-1 was assumed to replace the roof of the BART station platform as the most prominent visual landmark, but this was not considered a significant impact.

Project Assessment

The Project would result in a permanent visual change to the site once constructed. However, the Project will be generally consistent with the height and bulk of nearby development that has occurred within the DTC since certification of the Prior EIR, and would contribute to a cohesive appearance of the area. The Project will not have a new or demonstrable negative aesthetic effect nor result in a significant increase to any previously identified impacts to visual character.

Light and Glare

Prior EIR Conclusions

The Prior EIR identified potentially significant impacts relating to light and glare. Specifically, new sources of light from new office buildings and parking structures could spill onto adjacent residential uses, creating a nuisance for DTC residents. The Prior EIR found this impact to be reduced to a less-than-significant level through implementation of Prior EIR Mitigation Measure4.1-2

> **Prior EIR Mitigation Measure 4.1-2** (light and glare): As a condition of Site Development Review for individual projects, the City of Dublin shall require submittal of lighting plans for all non-residential projects along Iron Horse Parkway. These lighting plans shall ensure that all exterior lighting fixtures will either be oriented downward or equipped with cut-off lenses to ensure that no spillover of unwanted light onto adjacent residential areas shall occur.

Project Assessment

The Project does not yet have a detailed lighting plan. The DTC now includes the BART Phase 1 parking structure. That existing parking structure is adjacent to other mixed-use development, and has exterior lighting and streetlights that are similar to the lighting that would be included as part of the Project, and the addition of lighting for the Project would be consistent with the existing nighttime light conditions in the DTC area.

The Project will implement **Mitigation Measure 4.1-2**, demonstrating that specifications for the design of the garage will include provisions that all exterior lighting be oriented downward or equipped with cut-off lenses to ensure that no spill-over of unwanted light onto adjacent residential areas will occur. As the lead agency for the Project, County of Alameda GSA will ensure this mitigation measure is implemented as part of the County's design/build process. Furthermore, if the western half of the D-1 site is ultimately used for new multi-story residential development, particular design attention will be needed to address interior and exterior lighting of the Project to prevent car headlights or other interior lighting from affecting those residents.

With implementation of Prior EIR Mitigation Measure 4.1-2 (light and glare) through the County of Alameda's design/build process, lighting from the Project would not create a new source of significant light or glare, and would not substantially increase light or glare impacts beyond that identified in the Prior EIR and the impact would remain less-than-significant with implementation of mitigation measures.

Conclusion

This review of potential aesthetics impacts of the Project demonstrated there are no changed circumstances that alter the conclusions of the Prior EIR regarding aesthetic impacts. There is no new information about the Project that would alter the findings of the Prior EIR analysis. The Project is similar in location and smaller in scale as compared to development of Site D-1 as anticipated in the Prior EIR. The Project would not result in significant aesthetic impacts not previously identified in the Prior EIR nor would it substantially increase the significance of any impacts previously identified. The Project aesthetic impacts are consistent with or less severe than the impacts associated with a 10-story office development as originally assumed for Site D-1 in the Prior EIR, and no new or substantially more severe impacts would result.

The Project design implements Mitigation Measure 4.1-1 of the Prior EIR by retaining a north-south orientation and maintaining the north-south alignment of Campus Drive as a corridor to minimize obstruction of distant views. The Project will be required to implement Mitigation Measure 4.1-2 (light and glare) from the Prior EIR , requiring the County of Alameda to ensure that specifications for the Project design include provisions that all exterior lighting be oriented downward or equipped with cut-off lenses to ensure that no spill-over of unwanted light onto adjacent residential areas will occur.

	New or More Severe Significant Impact	Not a New Impact, Requires Mitigation from DCT EIR	No Impact / Less than Significant
II. Agricultural and Forestry Resources			
Would the project:			
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resource Agency, to non-agricultural use?	☐	☐	☑
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☑
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in public Resources Code section 12220(g)), timberland(as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☑
d) Result in the loss of forestland or conversion of forestland to non-forest use?	☐	☐	☑
e) Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forestland to non-forest use?	☐	☐	☑

Agriculture and Forest Resources

Prior EIR Conclusions

The Prior EIR determined that the DTC would not adversely affect agricultural resources. The DTC is located in a developed area that is not used for agricultural production, is not encumbered by a California Land Conservation Act (Williamson Act) agreement, and is not forested land.

Project Assessment

As was concluded for the DTC overall, the Project would not convert any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use, nor would it result in the loss of forest land or convert forest land to non-forest use. The Project would not result in any impacts related to agriculture and forest resources.

Conclusion

Consistent with the Prior EIR, the Project would not result in impacts to agricultural resources. There is no new information about the Project that would alter the findings of the Prior EIR analysis. The Project is in the same location as other development as anticipated in the Prior EIR. The Project would not result in significant agricultural or forested land impacts not previously identified in the Prior EIR nor would it substantially increase the significance of any impacts previously identified.

	New or More Severe Significant Impact	Not a New Impact, Requires Mitigation from DCT EIR	No Impact / Less than Significant
III. Air Quality			
Would the project:			
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☑
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☑	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☐	☑	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☑
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☑

Consistency with the Clean Air Plan

Prior EIR Conclusions

The Prior EIR did not include a specific analysis of the DTC with the BAAQMD Clean Air Plan. The Prior EIR did recognize that the DTC Plan does include a variety of design strategies that are effective in reducing air pollution, particularly by increasing density of residential uses and employment in an area with immediate access to non-automobile forms of transportation.

Project Analysis

The BAAQMD's most recent, 2017Clean Air Plan (CAP) is a call to action to "Spare the Air and Cool the Climate.[12]The 2017 CAP provides a regional strategy to protect public health and protect the climate. To protect public health, the CAP describes how the Air District will continue progress toward attaining all state and federal air quality standards, and eliminating health risk disparities from exposure to air pollution among Bay Area communities. To protect the climate, the 2017 CAP defines a vision for achieving reduction targets for greenhouse gases by years 2030 and 2050. The Project is consistent with the following CAP goals and strategies:

[12] Bay Area Air Quality Management District, *Final 2017 Clean Air Plan*, adopted April 19, 2017

- by facilitating access to regional transit opportunities and reducing overall VMT (see further discussion in the Transportation section), the Project helps decrease emissions of criteria pollutants, TACs, and GHGs
- as with all County-constructed projects, the Project will seek to achieve a minimum of LEED Silver certification or a County-approved equivalent, to the extent practicable[13]

The Project does not include any substantial use of water or wastewater facilities, does not generate substantial waste needing landfill, and does not generate any "super-GHG" emissions such as methane, black carbon or fluorinated gases.

Construction Emissions of Criteria Pollutants

Prior EIR Conclusions

The Prior EIR found that project construction activities would increase dustfall and locally elevated levels of PM10 downwind of construction activity, and that construction dust has the potential for creating a nuisance at nearby properties. To mitigate for this potentially significant impact, the Prior EIR identified the following mitigation measure:

> **Mitigation Measure 4.2-1** (construction impacts): The following measures are recommended, based on BAAQMD standards, to reduce construction impacts to a less-than-significant level. The following construction practices should be required during all phases of construction on the project site:
>
> a) Water all active construction areas as needed
>
> b) Watering or covering of stockpiles of debris, soil, sand, or other materials that can be blown by the wind
>
> c) Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard
>
> d) Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites
>
> e) Sweep daily (preferably with water sweepers) all paved access roads, parking areas and staging areas at construction sites
>
> f) Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets
>
> g) Hydroseed or apply non-toxic soil stabilizers to inactivate construction areas; Enclose, cover, water twice daily or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.)
>
> h) Limit traffic speeds on unpaved roads to 15 mph
>
> i) Install sandbags or other erosion control measures to prevent silt runoff to public roadways
>
> j) Replant vegetation in disturbed areas as quickly as possible

[13] County of Alameda, Chapter 4.38.040of the Green Building Ordinance (Ord. # 2003-63), April 2003

With implementation of this Mitigation measure, the Prior EIR concluded that air quality impacts related to criteria pollutants (particulate matter/dust) would be reduced to a level of less-than-significant.

Project Analysis

Dust

Fugitive dust emissions (particulate matter, or PM) would be generated by soil disturbance activities. Dust generated during construction varies substantially on a project-by-project basis, depending on the level of activity, the specific operations, and weather conditions. If uncontrolled, PM levels downwind of actively disturbed areas could possibly exceed State standards. In addition, dust deposited on adjacent properties could be a nuisance. If uncontrolled, dust generated by grading and construction activities represents a potentially significant impact associated with Project development.

The most current BAAQMD CEQA Guidelines recommend the following best management practices (BMPs) be implemented by all construction projects, regardless of itemized construction emission levels, to address particulate matter emissions.[14] Because these BMPs represent current practices for construction project, these BMPs now replace the individual measures of Prior EIR Mitigation Measure 4.2-1:

Mitigation Measure 4.2-1 (Amended): The following construction-period BMPS are required for all construction projects pursuant to the Project:

a) All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.

b) All haul trucks transporting soil, sand, or other loose material off-site shall be covered.

c) All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.

d) All vehicle speeds on unpaved roads shall be limited to 15 mph.

e) All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.

f) Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

g) All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

h) Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours.

[14] BAAQMD, *CEQA Air Quality Guidelines,* May 2017

The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

The BAAQMD CEQA Guidelines notes that the BMPs included in Basic construction measures (MM AQ-2A) can conservatively reduce fugitive dust by 50% to 53%.[15] Implementation of these BMPs would ensure that fugitive dust emissions from Project construction activities would remain less-than-significant.

Criteria Pollutants

Construction of the Project will generate criteria pollutant emissions that could potentially affect regional air quality. Construction activities include site preparation, minor grading, building construction, paving, and applications of architectural coatings. The primary criteria pollutants of concern during project construction would be ROG and NOx, and PM10, and PM2.5 emissions from the exhaust of off-road construction equipment and on-road vehicles.

The current version of the California Emissions Estimator Model (CalEEMod) was used to estimate construction-period emissions of criteria pollutants for the Project, presented in **Table 1**. The CalEEMod report for the Project's construction emissions is provided in **Appendix B**.

Table 1: Construction Period Criteria Pollutant Emissions

Description	ROG	NOx	PM10 *	PM2.5 *
Maximum Daily Construction emissions (lbs./day)	7.4	22.7	1.3	1.2
BAAQMD Threshold (lbs./day)	54	54	82	54
Exceed Threshold?	No	No	No	No

* Applies to exhaust emissions only, not fugitive dust

Source: Results from CalEEMod conducted 10/10/2018, see **Appendix B.**

Based on CalEEMod results for un-mitigated maximum daily construction emissions, construction activities would not generate criteria pollutants in amounts that exceed significance thresholds, and impacts related to construction emissions of criteria pollutants would be less-than-significant.

Operational Emissions of Criteria Pollutants

Prior EIR Conclusions

The Prior EIR found that the DTC would exceed the maximum BAAQMD air quality standards for regional impacts. Vehicle trips generated by DTC land uses would result in air pollutant emissions affecting the entire San Francisco Bay Area Air Basin, and would have a significant adverse impact on regional air quality. The DTC noted that one of the major design criteria for the DTC was accessibility to non-

15 BAAQMD, *CEQA Air Quality Guidelines*, May 2017, Appendix B page B-11

automobile forms of transportation, that these strategies could reduce projected regional air quality impacts as compared to a more typical suburban development, but that there was no practical way to reduce total DTC emissions sufficiently to meet BAAQMD significance thresholds. The DTCs impacts on regional air quality were considered significant and unavoidable.

Project Analysis

The Project will result in a minor amount of criteria pollutant emissions from area sources (e.g., landscape equipment). However, the Project (as a parking garage adjacent to the existing Dublin/Pleasanton BART station) increases access to the regional public transit system, and thereby reduces criteria pollutants from mobile sources as compared to existing conditions. According to BART data, the average trip length for a BART passenger entering the East Dublin/Pleasanton BART station is approximately 29 miles. Assuming that the Project is parked to 100% occupancy each day by BART patrons, and that each of these patrons will ride BART for an average trip of 24.5 miles (one-way) rather than driving that same distance, the Project will remove 570 vehicles from the freeway. This will result in a reduction of approximately 13,965 one-way VMTs per weekday, or nearly 28,000 round-trip VMTs per weekday. On an annual basis (conservatively assuming the parking garage is not used on weekends), the Project will result in a reduction of nearly 7.262 million VMTs per year.

The CalEEMod air emissions model was used to calculate the criteria pollutant emission reductions that would result from this reduction in VMTs attributable to the Project. The results of that model (see **Appendix C**) indicate the following:

- a reduction of approximately 0.44tons per year of mobile source ROG emissions
- a reduction of approximately 3.74 tons per year of mobile source NOx emissions
- a reduction of approximately 82 lbs per year of mobile source PM10exhaust emissions, and
- a reduction of approximately 78lbs per year of mobile source PM2.5 exhaust emissions

Based on these assumptions and modeled emissions, the Project would have a beneficial impact on regional air quality standards as a result of increasing access to regional transit and thereby removing vehicles from the roadways.

Construction-Period Health Risk

Prior EIR Conclusions

At the time of preparation of the Prior EIR there was no development in the DTC or immediate vicinity, there were no existing sensitive receptors, and no health risk analyses were conducted.

2016 BART Addendum Conclusions

At the time the proposed BART Phase 2 Garage project was being considered (in 2016), residential developments had occurred in the area (within 1,000 feet of the BART site) and an evaluation of potential health risk impacts to nearby sensitive receptors was conducted.[16] That analysis concluded that project construction would generate diesel particulate matter (DPM) andPM2.5emissions from off-

[16] 2016 BART Addendum, pp. 54-59.

road diesel construction equipment and on-road vehicles accessing the site, and that these emissions could potentially affect nearby sensitive receptors. An air dispersion model was used to estimate annual average concentration of DPM and PM2.5

Using a number of very conservative assumptions, the 2016 Addendum calculated the incremental increase in cancer risk, chronic hazard index (HI) and exposure to PM2.5 concentrations at sensitive receptors. At the maximum exposed individual receptor (MEIR), this analysis concluded that the estimated chronic HI for DPM and annual average PM2.5 concentrations from construction emissions for all off-road diesel equipment were below the BAAQMD's thresholds of significance, and the cancer risk level would not exceed the BAAQMD's threshold of significance. Therefore, construction-period emissions of toxic air contaminants (TACs), including DPM and PM2.5, resulting from the proposed BART garage were found to have a less-than-significant impact on nearby sensitive receptors.

The analysis presented in the 2016 Addendum accounted for emission-reduction measures that would be implemented under BART's Construction Emissions Reduction Plan. Those emission-reduction measures included retrofitting older diesel engines with Level 3 diesel particulate filters to reduce emissions of DPM and PM2.5, or use of Tier 4 diesel engines that already incorporate best available control technologies (BACT). In comparing the assessment of with- and without diesel particulate filters, the following relative benefits of including diesel particulate filters can be found:[17]

- the total cancer risks dropped from 21.3 per million without diesel particulate filters, to 3.1 per million with diesel particulate filters (an 85% decrease in risk) as compared to a threshold of 10 per million
- the chronic hazard index dropped from 0.02 without diesel particulate filters, to 0.002 with diesel particulate filters (a 90% decrease) as compared to a threshold of 1.0, and
- PM2.5 concentrations dropped from 0.085 micro-gram per cubic meter (ug/m3)without diesel particulate filters, to 0.025 with diesel particulate filters (a 70% decrease)as compared to a threshold of 0.3 ug/m3

Even without the diesel particulate filters, the chronic health index and PM2.5 concentration exposures would have been well below threshold levels, but the cancer risk would have exceed threshold levels of 10 increased cancer risks per million without reliance of the diesel particulate filters.

Project Analysis

A detailed construction-period health risk analysis has not been conducted for the Project. Instead, the health risk analysis presented in the 2016 Addendum, adjusted for the Project's closer proximity and thus increased DPM concentrations at the nearest receptor, is relied on for analysis of the Project. Use of the health risk assessment from the 2016 Addendum is an acceptable approach for the following reasons:

- the Project is very similar to the BART parking garage analyzed in the 2016 Addendum; both projects are parking garages of a similar size, in a similar location with similar meteorological conditions, and assumed to be constructed in similar ways

[17] BART, 2016 DTC Addendum, as found in Appendix B

- the health risk analysis presented in the 2016 Addendum is highly conservative and likely overstates actual health risks,[18] such that use of the same analysis for the Project is similarly conservative and would ensure that potential health risks are not under-estimated, and
- the BAAQMD acknowledges that it is difficult to produce accurate predictions of the health risks associated with short-term construction projects using currently available methodologies,[19] so that most modeling methodologies are very conservative

Recognizing the conservative nature of the health risks presented in the 2016 Addendum, that prior analysis has been adjusted to account for an even higher estimated concentration of DPM emissions, given the closer proximity of the Project to residential receptors across Iron Horse Parkway. At concentrations levels three times greater than assumed in the 2016 Addendum (a conservative approximation based on the AERMOD output map presented in Appendix B of the 2016 Addendum), DMP concentrations are conservatively estimated at approximately 0.035 ug/m3 (rather than 0.012 ug/m3 as used in the Addendum). At these conservatively assumed concentrations, the resulting increased cancer risk at the nearest receptor would be 9.3 in a million, below the threshold of 10 in a million.

Like BART, the County of Alameda will require an emission-reduction program as part of their design/build contract. That program will require retrofitting of older diesel engines with Level 3 diesel particulate filters, or use of Tier 4 diesel engines that already incorporate Best Available Control Technologies, or equivalent. The particulate filter requirement is necessary to ensure that health risks associated with construction activities remain less-than-significant.

Operational Health Risks

Project Analysis

The Project's operations will not introduce any stationary sources of TAC emissions (e.g., backup generator), and will not generate traffic that would substantially contribute mobile sources of TACs (e.g., diesel trucks). The Project is expected to result in a net decrease in overall VMT and associated overall DPM emissions by increasing access to regional transit.

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18 As indicated in the 2016 Addendum, page 57, "The incremental increase in cancer risk from on-site DPM emissions during construction was assessed for an infant exposed to DPM at the MEIR location. This exposure scenario represents the most sensitive individual who could be exposed to adverse air quality conditions near the Proposed Project. It was also assumed that the MEIR would be exposed to an annual average DPM concentration over the entire estimated duration of construction, which is about 2 years. Since construction equipment will not be operated continuously at the point of closest proximity to the MEIR for the full construction period, under no circumstances would the MEIR actually be exposed to these emission levels." (underline added)

19 As stated in BAAQMD Air Quality CEQA Guidelines, page , "Due to the variable nature of construction activity, the generation of TAC emissions in most cases would be temporary, especially considering the short amount of time such equipment is typically within an influential distance that would result in the exposure of nearby sensitive receptors to substantial concentrations. In addition, current models and methodologies for conducting health risk assessments are associated with longer-term exposure periods of 9, 40, and 70 years, which do not correlate well with the temporary and highly variable nature of construction activities. This results in difficulties with producing accurate estimates of health risk." (underline added)

The Project does not exceed BAAQMD's screening criteria for projects that may generate traffic congestion or that would potentially cause or contribute to significant local carbon monoxide (CO) concentrations. The Project meets screening criteria of:

- being consistent with the Alameda County Transportation Agency's Congestion Management Program
- not increasing traffic volumes at any affected intersections to more than 44,000 vehicles per hour, and not increasing traffic volumes to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited

Odors

Project Analysis

Project construction and/or operation will not generate significant odors. The Project will not include the handling or generation of noxious materials, and impacts related to odors will be less-than-significant.

Conclusions

This review of the Project demonstrates there are no changed circumstances that significantly alter the conclusions of the Prior EIR regarding air quality impacts. Since certification of the Prior EIR, there have been substantial changes in air quality regulations and CEQA threshold criteria pertaining to air quality, but the analysis presented above does not indicate the Project would result in a new or more severe air quality impacts as compared to these new regulations or thresholds. Changes now proposed pursuant to the Project do alter the conclusions of the Prior EIR regarding operational emissions of criteria pollutants, but this change results in a decrease in overall criteria pollutants, not an increase to the impact previously disclosed in the Prior EIR. This analysis does address new threshold questions (particularly pertaining to health risks) that were not addressed in the Prior EIR, but the analysis demonstrates that health risks would not be a new significant impact, as risk levels are less-than-significant.

Nothing about the Project as a parking garage would result in a new or more severe air quality effect than if the site were developed as an office or hotel use as analyzed in the Prior EIR. A hotel or office use would be a net generator of new air quality emissions, whereas the Projects reduction in overall VMT results in a decrease in air pollutant emissions. Although the Prior EIR did not fully address all current topics related to noise as itemized in the 2018 CEQA Guidelines Environmental Checklist, the Project would not generate any new impacts related to these topics.

The Project will be required to comply with all construction-period dust reduction measures as specified in **Amended Mitigation Measures 4.2-1** (amended to reflect the latest guidance from BAAQMD). The County of Alameda will include an emission-reduction requirement in its design/build contract, requiring its construction contractor to retrofit older diesel engines with Level 3 diesel particulate filters, or to use Tier 4 diesel engines that already incorporate Best Available Control Technologies, or equivalent.

	New or More Severe Significant Impact	Not a New Impact, Requires Mitigation from DCT EIR	No Impact / Less than Significant
IV. Biological Resources			
Would the project:			
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☑	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☑
c) Have a substantial adverse effect on federally protected wetlands (as defined by Section 404 of the Clean Water Act) or state protected wetlands, through direct removal, filling, hydrological interruption, or other means?	☐	☐	☑
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☑
e) Conflict with any local policies or ordinances protecting biological resource, such as a tree preservation policy or ordinance?	☐	☐	☑
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan?	☐	☐	☑

Rare Plants

Prior EIR Conclusions

Biological surveys conducted for the Prior EIR observed Congdon's spikeweed, a rare plant listed on List 1B of the California Native Plant Society, at two separate locations during a site visit in November 2000. The full extent of the plant population was not discernable at the time of the survey because the site had recently been disked. According to the Prior EIR, sites within the DTC area provide suitable habitat for Congdon's spikeweed and four other rare plant species. Although repeated disking degrades the habitat for these plants, it is unknown what level of disturbance the rare plant species can tolerate. It is known that Congdon s spikeweed thrives on disturbance.[20]

The Prior EIR concluded that, in order to quantify the size of potential rare plant populations that may occur onsite, rare plant surveys should be conducted on each parcel (or development phase) prior to ground disturbing activities. Rare plant surveys should be appropriately timed during the growing season and conducted according to resource agency protocols. The four special-status plant species with the greatest potential to occur on the DTC property are all late-blooming species, and late season surveys (in August) are recommended to ascertain whether any of these species are actually present on the site. The Prior EIR found that, with implementation of Mitigation Measure 4.3-1, impacts to Congdon's spikeweed and other potentially present rare plants would be reduced to a less-than-significant level.

Mitigation Measure 4.3-1 (Congdon's spikeweed): The following mitigation measures would mitigate the loss of a population of Congdon's tarplant (also known as spikeweed)and potential loss of four other special-status plant species and their habitat.[21]

a) The size of the area occupied by the tarplant should be determined from field surveys and notes on past on-site distribution, measuring the entire area from which the plant has been observed. If on-site avoidance is not possible, one of the following options must be taken to ensure replacement on a 1:1 acreage ratio:

b) Option "A": Permanently preserve, through use of a conservation easement or other similar method, equal amount of off-site acreage that contains the plant; or

c) Option "B": Harvest seeds from on-site plants to be lost or from another source within the Livermore-Amador Valley, and seed an equal amount of off-site area suitable for supporting the plant, which shall be preserved and protected in perpetuity.

d) Prior to submittal of a tentative map and/or a Site Development Review (SDR) application, the project developer shall submit a Mitigation and Monitoring plan to the City for its review and approval, demonstrating how the developer will comply with this mitigation measure, including the steps they will take to ensure that reseeding will be successful. If Option" B" is selected and is not successful, Option "A" shall be implemented.

With implementation of this Mitigation measure, the Prior EIR concluded that impacts to rare plants would be reduced to a level of less-than-significant.

One of the locations where Congdon's spikeweed was found during the 2000 survey has since been developed as a 3-story residential development and is no longer be considered habitat for this or any other rare plant. The other site where Congdon's spikeweed was found is the southern portion of Site D-2, immediately east of the BART parking garage, which remains undeveloped. A subsequent rare plant survey was conducted in August 2016 pursuant to a separate BART Phase II Parking Structure Expansion project (which has not been constructed). That 2016 survey concluded that habitat for rare plants was

[20]DTC Draft EIR, p. 63.

[21] DCT Final EIR, September 2002, page 3

not identified at the Phase II BART site, but that Congdon's spikeweed was observed east of the existing BART parking structure on Site D-2.

Project Site Assessment

No subsequent rare plant surveys have been conducted on the D-1 Project site. Rare plant species may remain present in the vicinity, or even at the Project site. As the lead agency for the Project, the County of Alameda GSA will ensure implementation of Prior EIR **Mitigation Measure 4.3-1**, including conducting a rare plant survey at the site prior to ground disturbing activities. If populations of special-status plants are detected during this survey, the additional measures pursuant to MM 4.3-1 will also apply.

California Red-Legged Frog

Prior EIR Conclusions

The Prior EIR concluded that potential foraging, cover, and hydration habitat for California red-legged frog was present at or near the DTC. Potential habitat for red-legged frogs was found to include a pool at Site A (then termed Parcel 1), the off-site drainage feature bordering the DTC to the west, and the flood control channel north of Site F. Mitigation Measure 4.3-2 of the Prior EIR required pre-construction surveys and agency consultation for red-legged frog, but Mitigation Measure 4.3-2 applies only to Sites A and F.

A subsequent analysis of red-legged frog habitat was prepared in 2016 pursuant to a separate BART Phase II Parking Structure Expansion project on a site south of the existing BART garage. That analysis concluded that the BART site does not provide suitable aquatic habitat or dry-season refugia for California red-legged frogs, and that California red-legged frogs that may attempt to move from known off-site habitat at Camp Parks to through BART site would be hindered by several barriers (distance, security fencing, a six-lane road and several high-density housing developments).

Project Site Assessment

No recent surveys or assessments of the Project site for California red-legged frog habitat have been conducted. However, the Project site (Site D-1) was not considered by the Prior EIR to contain potential habitat for red-legged frog. Mitigation Measure 4.3-2 does not apply to the Project. Given the distance from the Project site to the nearest habitat for California red-legged frogs and barriers to site access, and the lack of habitat as documented in the Prior EIR, California red-legged frogs are not expected at the Project site and no impacts to this species are anticipated. This is the same conclusion as was reached in the Prior EIR.

California Tiger Salamander

Prior EIR Conclusions

The Prior EIR cited two reports that addressed the potential presence of California tiger salamander. These reports identified one off-site pool located on the southwest end of the Iron Horse Trail and west of the BART station parking lot (not on the DTC) as potentially providing breeding habitat for California tiger salamanders, and no upland estivation habitat for California tiger salamander at or near the DTC. California tiger salamander was listed in the Prior EIR as a species determined to be unlikely to occur on the DTC due to the absence of suitable habitat. The Prior EIR did not conclude that development at the

DTC would adversely affect California tiger salamander, and no mitigation measures were recommended.

The 2016 CEQA document for the then-proposed Phase II BART parking structure included an on-site biological survey for that site. The 2016 document concluded no impacts to California tiger salamander were anticipated. California tiger salamanders were not expected at the BART site due to the distance from where California tiger salamanders might be found (at the former Camp Parks property two miles north).[22]

Project Assessment

No recent surveys have been conducted at the Project site for California tiger salamander. However, the Project site (Site D-1) was not considered by the Prior EIR to contain potential habitat for this species. As was concluded in the Prior EIR and subsequent BART CEQA document, no significant impacts to California tiger salamander are expected to result from the Project, given the distance from the Project site to the nearest habitat nearly two miles to the north. This is the same conclusion as was reached in the Prior EIR.

Foraging Raptors and Nesting Birds

Prior EIR Conclusions

The Prior EIR concluded that Northern harrier, white-tailed kite, ferruginous hawk and golden eagle were not expected to nest at the DTC but that it was likely that these and other raptors may forage for prey at the DTC on an occasional basis. Because of the presence of large areas of existing open space in the vicinity, potential impacts to foraging raptors would be less-than-significant. The Prior EIR also cited the Migratory Bird Treaty Act as providing protection for migratory bird species, birds in danger of extinction, and their active nests, including their eggs and young. Habitat features (e.g., trees, shrubs, burrows, and man-made structures provide suitable nesting sites for migratory birds. Disruption of any nesting native birds would violate the Migratory Bird Treaty Act and the Fish and Game Code.

Project Assessment

While little nesting habitat is present within the Project site, tall weedy annuals have the potential to support nesting birds. Consistent with existing regulatory requirements, the construction schedule for the Project should not result in site clearing, grubbing, grading or other construction during the nesting bird season, or if construction were to occur during the construction season then nesting surveys would be required and protection of nesting sites maintained. With implementation of these existing regulatory requirements, the Project would not result in any impact to nesting birds.

Western Burrowing Owl

Prior EIR Conclusions

The Prior EIR concluded that the loss of potential nesting and associated foraging habitat for burrowing owls in the vicinity could occur, and concluded that such an impact would be significant. Burrowing owls were not observed in surveys conducted in 2000 for the Prior EIR, but had been observed on the Parks

[22] 2016 BART Addendum, p.63

Reserve Forces Training Area and were known to occur in open grasslands in the vicinity. Suitable burrowing, nesting and foraging habitat was found, and western burrowing owl could use the DTC area as breeding or wintering habitat in the future. With implementation of Mitigation Measure 4.3-3 from the Prior EIR, potential impacts to western burrowing owl would be reduced to a less-than-significant level.

Mitigation Measure 4.3-3 (burrowing owl): The following measures will reduce potential impacts to burrowing owls to a less-than-significant level.

a) Pre-construction surveys by a qualified biologist shall be conducted on the entire Project area and within 150 meters (500 feet) of the Project area within 30 days prior to any ground disturbance. If ground disturbance is delayed or suspended for more than 30 days after the pre-construction survey, the site shall be resurveyed.

b) If over-wintering birds are present (September 1 to January 31) no disturbance should occur within 160 feet of occupied burrows unless the Department of Fish and Game provides a letter giving consent to relocate wintering birds. If owls must be moved away from the disturbance area, passive relocation techniques, following CDFG 1995 guidelines, should be used rather than trapping. If no overwintering birds are observed, burrows may be removed prior to the nesting season to reduce impacts from noise, dust, and human disturbance to mated pairs.

c) If removal of unoccupied potential nesting burrows prior to the nesting season is infeasible and construction must occur within the breeding season, maintain a minimum buffer (at least 250 feet)around active burrowing owl nesting sites identified by preconstruction surveys during the breeding season to avoid direct loss of individuals (February 1 - September 1). All active burrows shall be identified.

d) If construction is scheduled during summer, when young are not yet fledged, a 250-foot exclusion zone around the nest shall be established or construction shall be delayed until after the young have fledged, typically by August 31.

e) When removal of occupied burrows is unavoidable, existing unsuitable burrows should be enhanced (enlarged or cleared of debris) or new burrows created (by installing artificial burrows) at a2:1 ratio on protected lands, as provided for below.

f) A minimum of 6.5 acres of foraging habitat per pair or unpaired resident bird shall be acquired and permanently protected. The protected lands shall be adjacent to occupied burrowing owl habitat and at a location acceptable to CDFG.

g) The project proponent shall prepare a management plan and provide funding for long-term management and monitoring of the protected lands. The monitoring plan should include success criteria, remedial measures, and an annual report to CDFG.

Project Assessment

No recent surveys or assessments of the Project site for western burrowing owl have been conducted. However, the 2016 CEQA document for the BART Phase II garage found that this species has the potential to occur "within the vacant lot immediately north of the existing parking structure (i.e., Site D-1, or the Project site).[23]

As the lead agency for the Project, the County of Alameda GSA will ensure implementation of Prior EIR **Mitigation Measure 4.3-3**, including conducting a protocol-level, pre-construction survey for burrowing owls no more than 30 days prior to initiation of grading or construction activities. If this survey does discover burrowing owls, the additional measures pursuant to Mitigation Measure 4.3-3 would also apply.

Riparian Habitat, Wetlands or other Sensitive Natural Community

Prior EIR Conclusions

The Prior EIR concluded that off-site drainage features including the flood control channel along the northern portion of the DTC and the drainage swales along the Iron Horse Trail, support seasonal aquatic habitats, wetlands and riparian vegetation. However, the DTC was not found to affect these habitats, and no mitigation measures were identified.

Project Assessment

The Project is not near any identified riparian habitat or other sensitive natural community. Site D-1 is not near the flood control channel along the northern portion of the DTC or the drainage swales along the Iron Horse Trail. The Project would have no impact on riparian habitat or other sensitive natural community.

Interference with Migratory Wildlife Corridors

Prior EIR Conclusions

The Prior EIR found no potential impacts related to the movement of any resident or migratory fish or wildlife species. The 2016 BART CEQA document also found no potential interference with the movement of any native resident or migratory fish or wildlife species, and that no native wildlife nursery sites existed on that site or in the vicinity.

Project Assessment

Based on the findings of the Prior EIR and the subsequent 2016 BART CEQA document, development in the DTC (including the Project site) would not adversely affect the movement of any resident or migratory fish or wildlife species or interfere with the movement of any native resident or migratory fish or wildlife species. The Project would not have any impact on these biological resources and no mitigation is required.

Conflict with Tree Preservation Policy or Ordinance, or HCP

Prior EIR Conclusions

The Prior EIR did not address tree removal or consistency with tree preservation policies or ordinances as a biological resource impact. Neither the Prior EIR nor the subsequent BART CEQA document

[23] 2016 BART Addendum, p. 66

identified any habitat conservation plan (HCP), natural community conservation plan or other approved conservation plans approved for lands that include the DTC or individual sites within the DTC.

Project Assessment

The Project site is a completed graded site with no mature vegetation, including no trees subject to a tree preservation policy or ordinance. No habitat conservation plans, natural community conservation plan, or other approved conservation plans have been approved for lands that include the Project site.

Conclusions

This review of potential biological resource impacts of the Project demonstrates there are no changed circumstances that alter the conclusions of the Prior EIR regarding biological resource impacts. There is no new information about the Project that would alter the findings of the Prior EIR analysis. Nothing about the Project as a parking garage would result in a new or more severe environmental effect on biological resources than if the site were developed as an office or hotel use as analyzed in the Prior EIR. The Project would not result in any significant impacts to biological resource not previously identified in the Prior EIR, nor would it substantially increase the significance of such impacts previously identified. The Project's impacts on biological resources are consistent with the impacts associated with an office or hotel development as originally assumed for Site D-1 in the Prior EIR, and no new or substantially more severe impacts would result.

The Project will be required to implement **Mitigation Measure 4.3-1** from the Prior EIR by conducting a rare plant survey at the site prior to ground disturbing activities and, if special-status plant populations are detected during this survey, will be required to implement the additional measures for avoidance or relocation. The Project will also be required to implement **Mitigation Measure 4.3-3** from the Prior EIR by conducting a protocol-level, pre-construction survey for burrowing owls no more than 30 days prior to initiation of grading or construction activities. If the pre-construction does discover burrowing owls, the Project will be required to avoid impacts to burrowing owls by either establishing an exclusion zone around each occupied burrow or implementing passive relocation methods.

	New or More Severe Significant Impact	Not a New Impact, Requires Mitigation from DCT EIR	No Impact / Less than Significant
V. Cultural Resources			
Would the Project:			
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5? Specifically, a substantial adverse change includes physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the historical resource would be "materially impaired. "The significance of an historical resource is "materially impaired" when a project demolishes or materially alters, in an adverse manner, those physical characteristics of the resource that convey its historical significance <u>and</u> that justify its inclusion on, or eligibility for inclusion on an historical resource list (including the California Register of Historical Resources, the National Register of Historical Resources, Local Register, or historical resources survey form (DPR Form 523) with a rating of 1-5)	☐	☑	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☑	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☑	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☑	☐

Known Historic Resources

Prior EIR Conclusions

The cultural resources study prepared for the Prior EIR in December 2000 found no known significant historic resources within the DTC area. The subsequent 2016 BART CEQA document referenced a cultural resources assessment for the *Dublin Crossing Specific Plan EIR*, which included a record search of known historic resources in the broader area.[24] The only historic resource found to be eligible for the National Register of Historic Places pursuant to that study is the Camp Parks entrance sign, located outside of both the Dublin Crossing Specific Plan area and the DTC.

Project Site Assessment

The Project site consists of undeveloped land. Since the time the Camp Parks buildings were removed, the Project site has remained vacant and largely unused, with no known historic structures or resources.

24 City of Dublin, *Dublin Crossing Specific Plan EIR*, 2013

Currently Unknown Cultural Resources

Prior EIR Conclusions

The Prior EIR indicated that historic debris that may be more than 50 years old – including metal, glass, and porcelain fragments – may exist in the DTC area. Although discreet historic debris deposits may be potentially significant due to their age and affiliation with the Camp Parks military base, the Prior EIR concluded it unlikely that such concentrations of historical archeological material still exist, because the DTC area has been disturbed through grading, fill material has been placed, and the area has been developed. Additionally, no discreet deposits were discovered during any of the on-site surveys conducted. Previous investigations at or near the DTC found minor amounts of existing debris from previous military use of the site as a dump, and the demolition of buildings mixed in with the soil. The Prior EIR analysis identified and considered this debris, and found it to be historically insignificant due to the lack of discreet deposits. No other historic resources or potential historic resources were found within or adjacent to the DTC.

Both the Prior EIR and the Dublin Crossing Specific Plan EIR concluded that properties in the vicinity do not contain any known archeological resources and are unlikely to contain unknown archeological resources. However, it is possible that ground disturbance could discover unidentified archeological deposits or human remains. The Prior EIR also concluded that no paleontological sites had been recorded on or adjacent to the DTC area. The Prior EIR concluded that impacts to paleontological resources would be less-than-significant and no mitigation measures were required. However, the Prior EIR did find that the DTC area could contain buried prehistoric archaeological materials similar to those found south of I-580 inside the Hacienda Business Park. Although unlikely, the Prior EIR concluded there is potential that ground disturbance may discover previously unidentified and unrecorded cultural resources (historical artifacts, archeological deposits or human remains). To address this potential, the Prior EIR recommended Mitigation Measure 4.4-1 to reduce this potential impact to a less-than-significant level.

> **Mitigation Measure 4.4-1** (historical, archeological and Native American resources): If, during construction of individual development projects within the Transit Center, archeological, discrete historical or Native American artifacts are encountered, work on the project shall cease until compliance with CEQA Guidelines Section 15064.5 is demonstrated. Project work may be resumed in compliance with any applicable resource protection plan. If human remains are encountered, the County Coroner shall be contacted immediately. (LTS)

Project Site Assessment

In the event that unknown cultural resources are encountered during Project-related ground disturbance, the Project shall implement **Mitigation Measure 4.4-1**from the Prior EIR, including ceasing all work until compliance with CEQA Guidelines Section 15064.5 is demonstrated.

Tribal Cultural Resources

Prior EIR Conclusions

The Prior EIR (prepared in year 2000) did not specifically address the potential presence of tribal cultural resources. However, a more recent analysis conducted for the nearby Dublin Crossing Specific Plan EIR did include a search of the Sacred Lands file by the California Native American Heritage Commission. The presence of known Native American cultural resources within the general area was not indicated. Pursuant to Senate Bill 18 requirements, Native American Tribes were contacted for consultation as a part of the Dublin Crossing Specific Plan EIR. No tribes or tribal representatives responded with requests for consultation.[25]

Project Site Assessment

No known tribal cultural resources are present on the Project site, and a search of the Sacred Lands file by the California Native American Heritage Commission pursuant to the nearby Dublin Crossing Specific Plan EIR did not indicate any known or anticipated tribal cultural resources in the immediate area, which included the Project site.

Conclusions

This review of potential cultural resource impacts of the Project demonstrates there are no changed circumstances that alter the conclusions of the Prior EIR regarding cultural resource impacts. No previously unknown cultural resources have been identified in the vicinity since certification of the Prior EIR, and no changes have since occurred to archeological, paleontological or buried human remains at or near the Project site that would invalidate the findings of those prior analyses or their relevance to the Project. A more recent records search and literature review at the NWIC was completed for the Dublin Crossing Specific Plan EIR that did not identify cultural resources in the vicinity.

Analysis for the Dublin Crossing Specific Plan EIR also included a search of the Sacred Lands file by the California Native American Heritage Commission, which failed to indicate the presence of Native American cultural resources within the area. Nothing about the Project as a parking garage would result in a new or more severe environmental effect on unknown cultural resources than if the site were developed as an office or hotel use as analyzed in the Prior EIR. The Project would not result in any significant impacts to historic or cultural resources not previously identified in the Prior EIR, nor would it substantially increase the significance of such impacts previously identified. The Project’s impacts on cultural resources are consistent with the impacts associated with an office or hotel development as originally assumed for Site D-1 in the Prior EIR, and no new or substantially more severe impacts would result.

In the event of discovery of a previously unknown cultural resource, the Project will be required to implement **Mitigation Measure 4.4-1** from the Prior EIR. Implementation of this mitigation measure, as circumstances may arise, would reduce such impacts to a less-than-significant level.

[25] BART, 2016 Addendum to the DTC EIR, page 163

	New or More Severe Significant Impact	Not a New Impact, Requires Mitigation from DCT EIR	No Impact / Less than Significant
VI. Geology and Soils			
Would the project:			
a) Expose people or structures to substantial risk of loss, injury, or death involving:			
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map or Seismic Hazards Map issued by the State Geologist for the area or based on other substantial evidence of a known fault (refer to Division of Mines and Geology Special Publications 42 and 117 and PRC δ2690 et..seq.)?	☐	☐	☑
ii) Strong seismic ground shaking?	☐	☑	☐
iii) Seismic-related ground failure, including liquefaction, lateral spreading, subsidence, collapse?	☐	☑	☐
iv) Landslides?	☐	☐	☑
b) Result in substantial soil erosion or the loss of topsoil, creating substantial risks to life, property, or creek/waterways?	☐	☐	☑
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on-or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☑	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994, as it may be revised), creating substantial risks to life or property?	☐	☐	☑
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☑

Fault Rupture

Prior EIR Conclusions

The Prior EIR identified that the DTC was located within the State of California's designated Earthquake Fault Zone for the Pleasanton fault. The existence of the Pleasanton fault was first reported in 1963, indicating the Pleasanton fault was actually two parallel fault traces. In 1974, the California Department of Mines and Geology (CDMG) zoned the Pleasanton fault from the south side of the Amador Valley, through Camp Parks, and north to the southern end of the Dougherty Hills. In 1981, several investigations concluded that fault related features also existed north of Camp Parks in the Dougherty Hills, but exploration trenches across the inferred Pleasanton fault south of I-580 found no fault-related features. Following these investigations, CDMG recommended that portions of the Pleasanton fault south of I-580 be removed from the Earthquake Fault Zone Map since evidence to support Holocene-age faulting was very weak. CDMG also recommended that portions of the Pleasanton fault north of Camp Parks be removed from the Earthquake Fault Zone Maps. In 1982, the Earthquake Fault Zone Maps were revised to reflect these recommendations. The portion of the Pleasanton fault within Camp Parks remained as an Earthquake Fault Zone, largely because no studies had been performed on the federal lands.

A subsequent surface fault rupture hazards study was prepared in 1991 for the BART station, which revealed no evidence of fault traces. That 1991 study indicated subsurface soils dated back to the Holocene/Pleistocene, and concluded the Pleasanton fault, if it exists below the BART station site, had not ruptured the ground surface during the Holocene age. That study further concluded the requirements of the Alquist-Priolo Act had been satisfied and no building setback would be required.

Another subsequent Surface Fault Rupture Hazards Study (Kleinfelder 1999) was prepared specifically for the Prior EIR, which concluded that no substantial evidence for the existence of the inferred Pleasanton fault traces was found within the entire Holocene age soil profile. The conclusion was based on the lack of any fault-induced disruption to sediment and soil exposed in trenches excavated for this study, and for the 1991 BART study. The 1999 Kleinfelder study concluded the requirements of the Alquist-Priolo Act had been satisfied, that the risk of surface fault rupture occurrence at the DTC was very low, and that no building setback zones were required for development of the DTC.

Project Site Assessment

Based on the studies summarized in the Prior EIR, and because no faults with known surface rupture are known to occur at the Project site, it is reasonable to conclude that the potential for the Project to be exposed to surface fault rupture is less-than-significant.

Seismic Ground Shaking, Liquefaction and Landslides

Prior EIR Conclusions

The Prior EIR and the subsequent 2016 BART CEQA document concluded that ground shaking is likely to occur during the life of improvements at the DTC due to future earthquakes. The entire DTC area is located near several active faults. The Prior EIR cited a United States Geological Survey prediction of a 72% probability of a 6.7 magnitude or greater earthquake on one of these active regional San Francisco Bay Area faults in the next 30 years. Faults considered major contributors to this probability include the Calaveras, Hayward and Greenville faults, located about 1.5 miles southwest, eight miles southwest and eight miles northeast of the DTC, respectively. Very strong shaking from such a seismic event would be expected to result in extensive damage to unreinforced masonry buildings and other types of property damage.

The Prior EIR cited several geotechnical studies for development projects in the vicinity that found underlying soils to be generally cohesive and/or dense, and not subject to liquefaction. However, a few discontinuous and thin lenses of clean fine sand considered susceptible to liquefaction have been encountered, particularly adjacent to Tassajara Creek, about one mile east of the DTC. Consequently, the Prior EIR anticipated that a few confined layers of potentially liquefiable material might exist beneath the site. The potential for lateral spreading was considered less-than-significant due to the relatively flat site and absence of incised creek channels.

The Prior EIR did not identify any potential hazards related to landslides.

The Prior EIR recommended the following Mitigation Measure 4.5-1 and Mitigation Measure 4.5-2 to reduce these potential geologic impacts to a less-than-significant level:

> **Mitigation Measure 4.5-1:** Site-specific geotechnical investigations shall be required for each individual development proposed within the Transit Center project area. Design and construction of structures shall be in accordance with the seismic design requirements of the Uniform Building Code (UBC), which includes construction standards near fault factors. The site-specific geotechnical investigation should further investigate the presence of potentially liquefiable material at the site. Conventional design engineering techniques should be able to mitigate for minor settlements.
>
> **Mitigation Measure 4.5-2**: For each building, as well as public streets and other pavement areas constructed in the project area, the required site-specific geotechnical investigation shall address expansive soils and provide appropriate engineering and construction techniques to reduce potential damage to buildings and pavement surfaces.

Project Site Assessment

As an individual site within the overall DTC, the geologic impacts related to ground shaking and liquefaction as identified in the Prior EIR are applicable to development of the Project. As such, the Project is subject to **Mitigation Measure 4.5-1and Mitigation Measure 4.5-2** from the Prior EIR. Pursuant to these mitigation measures, development of the Project is subject to the latest version of the California Building Code (CBC).The CBC includes seismic safety provisions to ensure that structures are able to resist minor earthquakes undamaged, resist moderate earthquakes without significant structural damage, and resist severe earthquakes without collapse. Site-specific calculations of seismic design parameters are required in accordance with the CBC, based on site-specific ground movement created by the maximum credible earthquake at the Project site.

The Project site is level and not located within a mapped landslide or landslide hazard area or within an official zone of required investigation for seismically induced landsliding. Project improvements do not include substantive changes to grade that would create slope instability hazards. Potential impacts from landslides would be less-than-significant, and do not represent a new impact not previously disclosed in the Prior EIR.

Expansive Soils

Prior EIR Conclusions

The Prior EIR identified the presence of moderately to highly plastic clay occurring near surface soils in the DTC area, exhibiting a moderate to high expansion potential, concluding that the potential for shrink-swell of expansive soils can result in damage to buildings within the DTC with improperly designed foundations. Mitigation Measure 4.5-2 of the Prior EIR includes requirements for the geotechnical investigation, including an evaluation of potential impacts related to expansive soils for each building, public street and other paved areas, and incorporation of appropriate engineering and construction techniques for project design and construction.

Project Site Assessment

As an individual site within the overall DTC, the potential geologic impacts related to expansive soils as identified in the Prior EIR are applicable to development of the Project. As such, the Project is subject to Mitigation Measure 4.5-2 from the Prior EIR, requiring a site-specific geotechnical investigation that addresses expansive soils and provides appropriate engineering and construction techniques to reduce potential damage to buildings and pavement surfaces.

Soil Erosion

Prior EIR Conclusions

Potential impacts related to soil erosion were addressed in the Hydrology chapter of the Prior EIR (as Impact 4.7-3). That chapter of the Prior EIR concluded that short-term increases of soil erosion could result during construction, as the area is stripped of the limited natural vegetation and is exposure to wind and water erosion. To address this potential impact, the Prior EIR recommended the following Mitigation Measure 4.7-3 to reduce these impacts to a less-than-significant level:

> **Mitigation Measure 4.7-3**: Project sponsors shall prepare an erosion and sedimentation control plan for implementation throughout project construction. The plan should be prepared in accordance with City of Dublin and RWQCB design standards. It is recommended that this plan, at a minimum, include the following provisions:
>
> a) Existing vegetated areas should be left undisturbed until construction of improvements on each portion of the development site is actually ready to commence;
>
> b) All disturbed areas should be immediately revegetated or otherwise protected from both wind and water erosion upon the completion of grading activities;
>
> c) Stormwater runoff should be collected into stable drainage channels, from small drainage basins, to prevent the buildup of large, potentially erosive stormwater flows;
>
> d) Specific measures to control erosion from stockpiled earth and exposed soil;
>
> e) Runoff should be directed away from all areas disturbed by construction;
>
> f) Sediment ponds or siltation basins should be used to trap eroded soils before runoff is discharged into on-site or offsite drainage culverts and channels.
>
> g) To the extent possible, project sponsors should schedule major site development work involving excavation and earth moving for construction during the dry season.

Project Site Assessment

As an individual site within the overall DTC, the potential geologic impacts related to soil erosion as identified in the Prior EIR are applicable to development of the Project. Grading and earthmoving during Project construction has the potential to result in erosion and loss of topsoil, and exposed soils could be entrained in stormwater runoff and transported off-site. As such, the Project is subject to **Mitigation Measure 4.7-3** from the Prior EIR, requiring preparation of an erosion and sedimentation control plan.

Current regulatory requirements of the RWQCB and the County of Alameda Clean Water Program now require an erosion control plan to be prepared as a site-specific Stormwater Pollution Prevention Plan (SWPPP). Although designed primarily to protect stormwater quality, the SWPPP would incorporate Best Management Practices (BMPs) to minimize erosion. Additional details regarding the SWPPP are provided in the Hydrology and Water Quality section of this document. Compliance with SWPPP requirements would reduce potential soil erosion impacts to a less-than-significant level.

Soil Capability to Supporting the Use of Septic Tanks

Project Site Assessment

The Project does not propose to use a septic or on-site wastewater disposal system. The Project will be connected to the Dublin San Ramon Services District sanitary sewer system, and the Project would have no impact related to this potential geologic concern.

Conclusion

This review of potential geologic impacts to the Project demonstrates there are no changed circumstances that alter the conclusions of the Prior EIR. Information regarding geology and soils for the Project is based on the geology and soils analysis performed for the Prior EIR and available public agency geologic hazard maps and references. Although the Prior EIR analysis and other cited geotechnical investigations were prepared 2001/2002, no changes in geologic conditions at or near the Project site have occurred since that time that would invalidate the findings of those analyses or their relevance to the Project. No previously unknown geological hazards or concerns have been identified since certification of the DTC EIR. Nothing about the Project as a parking garage would result in a new or more severe geologic effect than if the site were developed as an office or hotel use as analyzed in the Prior EIR. The Project would not result in any significant geologic impacts not previously identified in the Prior EIR, nor would it substantially increase the significance of such impacts previously identified. Geologic effects of the Project are consistent with the impacts associated with an office or hotel development as originally assumed for Site D-1 in the Prior EIR, and no new or substantially more severe impacts would result.

The Project will be required to implement **Mitigation Measures 4.7-1 and 4.7-2** from the Prior EIR. Implementation of the recommendations from these geotechnical investigation would reduce any potential impacts related to seismic groundshaking, liquefaction and expansive soils to a less-than-significant level. The Project will also be required to implement **Mitigation Measures 4.7-3** from the Prior EIR, as updated to reflect current regulatory requirements, to address potential soil erosion. Implementation of this mitigation measure would reduce such impacts to a less-than-significant level.

	New or More Severe Significant Impact	Not a New Impact, Requires Mitigation from DCT EIR	No Impact / Less than Significant
VII. Greenhouse Gas Emissions			
Would the Project:			
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☑
b) Conflict with an applicable plan, policy or regulation adopted for purposes of reducing the emission of greenhouse gas?	☐	☐	☑

GHG Emissions

Prior EIR Conclusions

The Prior EIR did not evaluate potential impacts related to greenhouse gas (GHG) emissions.

Background and Thresholds

Gases that trap heat in the Earth's atmosphere are called greenhouse gases, or GHGs. These gases play a critical role in determining the Earth's surface temperature. Part of the solar radiation that would have been reflected back into space is absorbed by these gases, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Scientists have demonstrated that emissions from human activities such as electricity generation, vehicle emissions, and even farming and forestry practices have elevated the concentration of GHGs in the atmosphere beyond naturally occurring concentrations, enhancing the greenhouse effect and contributing to the larger process of global climate change. The six primary GHGs are:

- Carbon dioxide (CO_2), emitted when solid waste, fossil fuels and wood are burned;
- Methane (CH_4), produced through the anaerobic decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, incomplete fossil fuel combustion, and water and wastewater treatment;
- Nitrous oxide (N_2O), typically generated as a result of soil cultivation practices, particularly the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning;
- Hydrofluorocarbons (HFCs), primarily used as refrigerants;
- Perfluorocarbons (PFCs), originally introduced as alternatives to ozone depleting substances and typically emitted as by-products of industrial and manufacturing processes; and
- Sulfur hexafluoride (SF_6), primarily used in electrical transmission and distribution.

Though there are other contributors to global warming, these six GHGs are identified explicitly by the U.S. Environmental Protection Agency (EPA) as threatening the public health and welfare of current and future generations.[26]

Scientific consensus holds that human activity is increasing atmospheric GHG concentrations to levels far above what would be expected given natural variability. The over-abundance of GHGs in the atmosphere has led to an unexpected warming of the earth and has already started affecting the Earth's climate system. If trends remain unchanged, continued GHG emissions above current rates will induce further warming changes in the global climate system and pose even greater risks than those currently witnessed.[27] Research suggests that because of climate change, California will experience hotter and drier conditions, reductions in winter snow, an increase in winter rains, sea level rise, significant changes to the water cycle, and an increased occurrence of extreme weather events. Such compounded impacts will affect economic systems throughout the state.

Several State regulatory measures directly address the issue of GHG emissions:

- In 2005, Governor Schwarzenegger's Executive Order S-3-05 set the GHG reduction targets for California: by 2010 reduce GHG emissions to 2000 levels; by 2020 reduce GHG emissions to 1990 levels; by 2050 reduce GHG emissions to 80 percent below 1990 levels.
- In 2006, the California State Legislature passed the California Global Warming Solutions Act (AB 32), which requires the California Air Resources Board to develop and implement regulatory and market mechanisms that will reduce GHG emissions to 1990 levels by 2020.
- In 2015, Governor Brown Jr. signed Executive Order B-30-15 to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. This emission reduction target is intended to make it possible to reach the ultimate goal of reducing emissions 80 percent under 1990 levels by 2050.
- In 2016, the State Legislature adopted Senate Bill 32, which requires reduction of GHG emissions to 40 percent below the 1990 level by 2030.

The BAAQMD 2017 CEQA Guidelines establish two applicable thresholds for evaluating the potential significance of operational GHG emissions.[28] These thresholds are based on mass emissions of carbon dioxide equivalent (CO2e) per year, and/or a GHG emissions efficiency threshold based on emissions per service population. These numerical thresholds represent the amount of GHG reductions required from land use-based projects needed to help achieve the state GHG emission targets by year 2020 as defined under AB 32, and to help achieve the state GHG emission targets by year 2030 as defined under SB 32 and EO B-30-15.Based on this methodology, a project's contribution to global climate change is considered cumulatively considerable if its land use-based GHG emissions exceed:

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26 US EPA, Overview of Greenhouse Gases, accessed at https://www.epa.gov/ghgemissions/overview-greenhouse-gases

27 IPCC, 2014: Climate Change 2014: Synthesis Report, Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp. accessed at http://www.ipcc.ch/report/ar5/syr/

28 BAAQMD, *CEQA Air Quality Guidelines*, May 2017

- 1,100 metric tons of carbon dioxide equivalent per year (MTCO2e/yr.), or
- an efficiency threshold of 4.6 MTCO2e per service population at year 2020, or
- an efficiency threshold of 2.7 MTCO2e per service population at year 2030

Project Assessment

Construction and operation of the Project would generate GHGs emissions from the following three sources: off-road equipment used during construction, energy use during operations, and on-road mobile source emission form vehicles.

The CalEEMod air emissions model was used to calculate the GHG emission attributable to construction and operations of the Project (see **Appendix C**). The results of this modelling are indicated in **Table 2**, below. As indicated, the total GHG emissions estimated from Project construction (amortized over an expected 40-year lifespan), plus GHG emissions expected as a result of energy use during the Project's operation are relatively low, well below applicable thresholds.

For GHG emissions from on-road vehicles (mobile sources), the modeling recognizes that as a parking garage adjacent to the existing Dublin/Pleasanton BART station, the Project will be used to increase access to the regional public transit system. According to BART data, the average trip length for a BART passenger entering the East Dublin/Pleasanton BART station is approximately 29 miles. Assuming that the Project is parked to 100% occupancy each day by BART patrons, and that each of these patrons will ride BART for an average trip of 24.5 miles (one-way) rather than driving that same distance, the Project will remove 570 vehicles from the freeway. This will result in a reduction of approximately 13,965 one-way VMTs per weekday, or nearly 28,000 round-trip VMTs per weekday. On an annual basis (conservatively assuming the parking garage is not used on weekends), the Project will result in a reduction of nearly 7.262 million VMTs per year. The GHG emission reductions attributed to these reduced VMTs is calculated from the CalEEMod model as approximately -3,101 MTCO2e/ year, as also shown in Table 2.

Table 2: Project GHG Emissions

Emission Sources:		MTCO2e/yr
Construction Emission (annualized over 40 years) [1]		8.4
Area Sources		0.1
Energy Demand		96.3
		104.8
	CEQA Threshold:	1,100
	Exceed Threshold?	No
Mobile Source (reductions)		-3,101

Notes:

Total construction emissions of 342 MTCO2e, divided by a 40-year life expectancy of the garage

Source: CalEEMod, see **Appendix C**

By reducing GHG emissions as shown in this analysis, the Project represents a substantial contribution toward helping to achieve the State GHG emission reduction targets as defined under AB 32, and the State GHG emission targets by year 2030 as defined under SB 32 and EO B-30-15. The Project is consistent with applicable plans, policies and regulations adopted to meet the State's GHG reduction target.

Conclusions

This analysis of GHG emissions impacts of the Project fully accounts for changed circumstances and new information regarding GHG emissions that has become known and relied upon under CEQA since certification of the Prior EIR in year 2000.Based on this new information and changed circumstances, the analysis demonstrates that the Project would not result in a new significant impact related to GHG emissions, but rather would reduce GHG emissions by reducing VMT by facilitating access to regional transit. This issue was not addressed in the previous Prior EIR.

	New or More Severe Significant Impact	Not a New Impact, Requires Mitigation from DCT EIR	No Impact / Less than Significant
VIII. Hazards and Hazardous Materials			
Would the project:			
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☑
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☑	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☑
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment?	☐	☑	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, and would result in a safety hazard for people residing or working in the project area?	☐	☐	☑
f) Be located within the vicinity of a private airstrip, and would result in a safety hazard for people residing or working in the project area?	☐	☐	☑
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☑
h) Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☑

Presence of Hazardous Materials

Prior EIR Conclusions

The Prior EIR included a review of government records and determined the DTC was not listed on any of the government databases searched. No sites within 1/8 mile had documented releases of hazardous materials or petroleum hydrocarbons. One site (an auto dealership) within 1/8 to 1/4 mile of the DTC area had a documented release, six sites within a 1/4 to 1/2 mile radius of the DTC area had documented releases, and nine additional sites within ½ mile had documented releases of hazardous materials or petroleum hydrocarbons.

Evidence of hazardous materials storage and disposal within the DTC area was not observed during a December 2000review of historical aerial photographs and USGS maps, or during a site reconnaissance. Soil and groundwater samples collected during two prior investigations found no petroleum hydrocarbons or semi-volatile organics. Asbestos containing materials previously located at the western portion of the DTC (known as Site A) had been removed. PCE and TCE were detected in groundwater samples at Site D-2, but the levels were determined not to pose a significant human health risk. The presence of these hazardous substances at such low levels was not found to result in significant adverse impacts to human health. However, given the past ownership of the DTC area by the military, and the apparent dumping of debris by the military on portions of the DTC area, the Prior EIR found there was the potential that currently unknown environmental hazards could be found within the DTC area during more thorough site investigation for individual projects.

The Prior EIR concluded that disturbance or reuse of soil potentially impacted with hazardous materials, or encountering buried objects that could contain hazardous materials during construction, could result in exposure of construction workers, the public and/or the environment to hazardous materials. This was identified as a potentially significant impact. With implementation of Mitigation Measure 4.6-1 (below), this impact was found reduced to a less-than-significant level.

> **Mitigation Measure 4.6-1**: Phase I and (if required) Phase II level environmental investigations shall be performed for each individual development project within the proposed Transit Center prior to any grading or construction activity. Individual developers shall be responsible for performing any necessary cleanup, as recommended in the environmental investigations and as required by regulatory authorities.

Subsequently, the 2016 BART Addendum disclosed that the BART Phase II garage site was located within the boundaries of the former Parks Airforce Base, which was listed on the DTSC's Envirostor database as a hazardous materials release site (and therefore on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5).[29] That 2016 Addendum also concluded that buried waste and contaminated soil may be present in the DTC area based on its likely past use as a military dump and salvage yard.

Project Site Assessment

As required by Prior EIR Mitigation Measure 4.6-1, a Phase I Environmental Site Assessment has been performed for the Project site.[30] The Phase 1 ESA included a review of available environmental records and historical data for the Subject Property, based on ASTM Standard Practice E1527-13. The database search revealed the following environmental records for the Project site and surrounding properties:

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[29] DTSC, 2016

[30] ACC Environmental, *Phase I Environmental Site Assessment Report, County of Alameda Parcel D1*, Dublin, California, April 27, 2018

- Records for the Project site indicate the property is located within an area listed on the Department of Defense (DOD) database, with site name Camp Parks Military Reservation
- Records for adjacent and nearby properties of potential concern include the Parks Air Force Base/Parks Reserve Forces Training Area (address listed as 5067 Iron Horse Parkway). The area surrounding the Project site is listed on the DOD, HIST Cal-Sites, Response, DEED, FUDS, Envirostor, County of Alameda CS, WDS, and Cortese, LUST, and SLIC databases. According to this record, hazardous materials have been used, stored and generated within the surrounding area.
- Other records for adjacent and nearby properties identify two sites (the BART East Dublin/Pleasanton Station and 5411 Martinelli Way) as being listed on databases, but not expected to represent significant environmental concerns for the Subject Property.
- No hazardous materials releases were identified or recorded specifically on the Project site (Site D-1).

The Phase 1 ESA concludes that known historic uses of the former military property suggests that buried waste and contaminated soil may be present at the Project site. Contaminants commonly present in historic dumps and salvage yards include metals, asbestos, petroleum hydrocarbons, polycyclic aromatic hydrocarbons, polychlorinated biphenyls, organochlorine pesticides (OCPs), volatile organic compounds and semi-volatile organic compounds. To address this potential, the Phase 1 ESA recommends the following actions:

- preparation of a Soil and Groundwater Management Plan that describes protocol to be followed if soil contamination or questionable subsurface debris is encountered during earthwork
- sampling protocol to be conducted, if warranted, in order to protect workers during earthwork;, and
- protocol for groundwater management in the event that excavation dewatering is required as part of redevelopment

Implementation of these Phase 1 ESA recommendations will satisfy the requirements of Prior EIR **Mitigation Measure 4.6-1**, and ensure that potential impacts from disturbance of soil contaminated with hazardous materials, or encountering buried objects that could contain hazardous materials during construction, would be less-than-significant.

Routine Transport and Use or Disposal of Hazardous Materials

Prior EIR Conclusions

The Prior EIR did not directly address the potential impacts associated with routine transport, use or disposal of hazardous materials.

The 2016 BART Addendum provided a complete setting of regulatory requirements at both the federal and state levels addressing worker health and safety, as well as applicable regulations and standards for construction. That Addendum concluded that routine transport, use, and disposal of hazardous materials during construction of that project would be required to comply with these applicable standards, which would reduce the severity of potential health hazards for construction workers to a less-than-significant level.

Project Site Assessment

The Project's proposed parking structure would not involve routine storage, use or disposal of hazardous materials during its operation. As such, the Project would also not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within ¼ mile of an existing or proposed school. No schools are located within ¼ mile of the Project site. The nearest school is James Dougherty Elementary School located at 5301 Hibernia Drive, more than ½ mile northeast of the Project site.

Hazardous materials (e.g., oil, grease, fuels, paint) would be transported and used on site as part of construction activities. The routine transport and use or disposal of these hazardous materials could pose a potential hazard to construction workers if workers are exposed through inhalation of vapors, direct contact with skin or accidental ingestion. The routine transport, use, or disposal of these hazardous materials would not pose a significant hazard to the public or environment unless the hazardous materials were accidentally spilled or released into the environment. Management of hazardous materials during construction activities would be subject to the requirements of a Construction General Permit (CGP), which also requires preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP) with hazardous materials storage requirements. Construction of the Project would result in the generation of various waste materials that would require recycling and/or disposal, including some waste materials that may be classified as hazardous waste. Under applicable regulations, hazardous wastes would be transported by a licensed hazardous waste hauler and disposed of at facilities that are permitted to accept such materials. Compliance with these regulations would ensure that the Project would not create a significant hazard to the public or the environment with regard to routine transport, use or disposal of hazardous materials, and the impact would be less-than-significant.

Risk of Upset

Prior EIR Conclusions

The Prior EIR identified a potential hazardous impact related to the risk of fire and explosion should the existing petroleum pipeline within the Iron Horse Trail be damaged during construction within the DTC or the Iron Horse Trail. Mitigation Measure 4.6-2 required all construction of residential developments on Sites A and C adjacent to the Iron Horse Trail right-of-way to include flags to prevent heavy equipment from crossing over the petroleum pipeline and fiber optic cable. Construction materials and equipment is not to be stored on top of the right-of-way, and future residential development within the DTC shall maintain a minimum setback of 50 feet from the petroleum pipeline to the nearest habitable residential structure. With implementation of Mitigation Measure 4.6-2, this impact was found to be less-than-significant.

Project Assessment

The Project is not located on DTC Sites A or C near the Iron Horse Trail, and does not include residential development. This impact and mitigation measure would not be applicable to the Project.

Airport-related Safety Hazard

Project Assessment

The Project site is located approximately 3.5 miles west-northwest of the Livermore Municipal Airport, and is not located within this Airport's Influence Area, where the County of Alameda Airport Land Use Commission is authorized to review local land use actions. The Project site is not located near any private use airports or airstrips. Impacts related to a safety hazard from proximity to an airport or aircraft overflight are less-than-significant.

Interfere with an Emergency Response or Evacuation Plan

The Project would not impair or interfere with any emergency response or evacuation plans in the vicinity, as the Project would not alter existing streets used for emergency access or evacuation. During construction, the Project would involve limited short-term use of local streets for delivery of construction equipment and supplies, and for workers commuting to the site. During construction activities, all construction equipment would be stored on the Project site or another nearby staging area. Potential impacts to emergency evacuation routes or emergency response plans from the Project are less-than-significant.

Wildland Fire

Project Assessment

The city of Dublin is not within a very-high fire hazard severity zone. The Project site is surrounded on three sides by developed land that is largely covered by structures, pavement and roadways to the north, west, and south. These site conditions are not prone to wildland fires and impacts related to wildland fires are less-than-significant.

Conclusion

This review of the Project demonstrates there are no changed circumstances that alter the conclusions of the Prior EIR regarding hazard or hazardous materials impacts. Potential impacts related to hazardous materials resulting from past military uses were identified in the Prior EIR and the 2006 BART Addendum, and Mitigation Measure 4.6-1 of the Prior EIR, which requires environmental investigation and cleanup of individual development projects within the DTC, was developed to address this impact. There is no new information about the Project that would alter the findings of the Prior EIR analysis. The database search conducted for the Project reveals more environmental records for the surrounding properties than fully disclosed in the Prior EIR. However, these more current records do not identify any new significant environmental concerns for the Project than were identified in the Prior EIR, and no hazardous materials releases were identified or recorded specifically on the Project site.

Nothing about the Project as a parking garage would result in a new or more severe environmental effect related to hazards or hazardous materials than if the site were developed as an office or hotel use as analyzed in the Prior EIR. The Project would not result in any new significant hazards impacts not previously identified in the Prior EIR, nor would it substantially increase the significance of such impacts previously identified. Although the Prior EIR did not fully address topics related to routine transport and use of hazardous materials, airport-related safety concerns, emergency response and evacuation or wildland fires, the Project would not have new impacts related to these topics. The Project's impacts related to hazards and hazardous materials are generally consistent with the impacts otherwise associated with an office or hotel development as assumed for Site D-1 in the Prior EIR, and no new or substantially more severe impacts would result.

The Project will be required to implement **Mitigation Measure 4.6-1** from the Prior EIR. The County of Alameda GSA, as the Project sponsor, has already conducted a Phase 1 environmental investigations for the Project site, and will be responsible for ensuring all recommendations form that Phase 1 ESA are implemented in conformance with the requirements of applicable regulatory authorities.

	New or More Severe Significant Impact	Not a New Impact, Requires Mitigation from DCT EIR	No Impact / Less than Significant
IX. Hydrology and Water Quality			
Would the project:			
a) Violate any water quality standards or waste discharge requirements?	☐	☑	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☑
Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site?	☐	☑	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?	☐	☐	☑
e) Create or contribute substantial runoff that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☑
f) Otherwise substantially degrade water quality?	☐	☑	☐
g) Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☑
h) Place housing within a 100-year flood hazard area structures that would impede or redirect flood flows?	☐	☐	☑
i) Expose people or structures to a substantial risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☑
j) Result in inundation by seiche, tsunami, or mudflow?	☐	☐	☑

Construction Period Impacts to Water Quality

Prior EIR Conclusions

The Prior EIR concluded that surface water quality impacts could be anticipated during DTC construction affecting soil erosion and surface water quality. During project construction when existing pavement and vegetation would be removed from development sites, the potential for soil erosion would be at its greatest, and non-point pollution form construction activities could occur. The following mitigation measures were recommended to reduce non-point source pollution during construction to a less-than-significant level:

Mitigation Measure 4.7-1 (water quality): Development projects within the proposed Transit Center are subject to the City of Dublin's NPDES General Construction Permit from the State Water Resources Control Board. The terms of this permit require that project development not cause any increase of sedimentation, turbidity or hazardous materials concentrations within downstream receiving waters. It is expected that implementation of the erosion control plan outlined below under Mitigation Measure 4.7-2 would satisfy all NPDES erosion and sedimentation requirements, but additional provisions are needed for the proper handling and disposal of fuels and hazardous construction materials.

Mitigation Measure 4.7-2 (water quality): Each individual development project within the Transit Center shall prepare a stormwater Pollution Prevention Plan (SWPPP) that incorporates Best Management Practices (BMPs) for construction and post-construction conditions. The SWPPP shall be prepared to Regional Water Quality Control Board standards in effect at the time permits are requested. The SWPPP shall include, but is not limited to incorporation of grassy swales into landscaped areas, use of fossil filters, covering of solid waste and recycling areas and similar features.

The following mitigation measure was specifically recommended to reduce potential soil erosion during construction to a less-than-significant level.

Mitigation Measure 4.7-3 (soil erosion): The project sponsors shall prepare an erosion and sedimentation control plan for implementation throughout project construction. The plan should be prepared in accordance with City of Dublin and RWQCB design standards. It is recommended that this plan, at a minimum, include the following provisions:

a) Existing vegetated areas should be left undisturbed until construction of improvements on each portion of the development site is actually ready to commence;

b) All disturbed areas should be immediately revegetated or otherwise protected from both wind and water erosion upon the completion of grading activities;

c) Stormwater runoff should be collected into stable drainage channels, from small drainage basins, to prevent the buildup of large, potentially erosive stormwater flows;

d) Specific measures to control erosion from stockpiled earth and exposed soil;

e) Runoff should be directed away from all areas disturbed by construction;

f) Sediment ponds or siltation basins should be used to trap eroded soils before runoff is discharged into onsite or offsite drainage culverts and channels.

g) To the extent possible, project sponsors should schedule major site development work involving excavation and earth moving for construction during the dry season.

Project Assessment

Construction of the Project will involve minor grading and excavation to accommodate perimeter and mat foundations, drainage facilities, underground utility installation and construction of the adjacent roads. These activities will disturb an area of more than 1 acre, resulting in potential erosion and movement of sediments into the storm drain system, and pollutants from construction equipment and materials could potentially contribute to stormwater pollution, particularly during storm events.

The Project will be required to obtain permits and comply with regulations of the NPDES General Construction Permit for stormwater discharges associated with construction and land disturbance activities.[31]Under these regulations, a Stormwater Pollution Prevention Plan (SWPPP) will be prepared that incorporates Best Management Practices (BMPs) for construction activities to prevent stormwater pollutants generated during construction of the Project to enter stormwater flows, as well as an Erosion Control Plan. The Construction General Permit performance standards require minimizing or preventing pollutants in stormwater discharges through use of controls, structures and management practices that achieve best available technology for treatment of toxic and nonconventional pollutants, and best conventional technology for treatment of conventional pollutants. The purpose of the SWPPP is to identify sources of sediment and other pollutants, and ensure implementation of BMPs to reduce or eliminate sediment and other pollutants in stormwater and non-stormwater discharges during construction.

Compliance with the Construction General Permit would satisfy Prior EIR **Mitigation Measures4.7-1, 4.7-2 and 4.7-3**, which together requires individual development projects within the DTC area to prepare an erosion and sedimentation control plan and to comply with those NPDES and General Construction Permit requirements effective at the time. Compliance with the Construction General Permit requirements would reduce potential construction phase impacts on water quality to a less-than-significant level.

Operational Period Impacts to Water Quality

Prior EIR Conclusions

The Prior EIR concluded that the quality of stormwater runoff from the DTC could be expected to decline as a result of increased numbers of non-point source urban pollutants including debris, landscaping fertilizers and pesticides, heavy metals, oil and gas residues, and tire fragments and debris normally deposited by vehicular traffic. Stormwater runoff from developed portions of the DTC could carry non-point source pollutants into surface waters within the City and into downstream drainage channels, where they could cause a cumulative degradation of water quality in San Francisco Bay.

Mitigation Measure4.7-2 was recommended to reduce operational period non-point source pollution to a less-than-significant level. The Prior EIR described a number of source control and post-discharge

[31] State Water Resources Control Board, Construction General Permit Order 2009-0009-DWQ, accessed at https://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.html

treatment programs that could be implemented by the applicant and/or the City. Identified source control programs included public education, limits on use of non-biodegradable fertilizers or pesticides, a storm drain inlet cleaning and maintenance program, and other measures to control pollutants and prevent them from entering storm drain systems. Identified treatment program measures included a combination of detention ponds, bio-filtration and fossil filters installed in storm drain inlets. When properly designed and implemented, the Prior EIR concluded that these methods would improve the quality of stormwater runoff from urban sites. Further design and implementation recommendations were included in the then-current Municipal Handbook of Best Management Practices. The Prior EIR concluded that implementation of source control and post-discharge treatment would reduce operational-period water quality impacts to a less-than-significant level.

Project Assessment

The Project will result in increased vehicle use and the discharge of associated pollutants. Leaks of fuel or lubricants, tire wear, brake dust and fallout from exhaust would contribute petroleum hydrocarbons, heavy metals and sediment to the pollutant load in runoff transported to receiving waters. Runoff from new landscaped areas could contain residual pesticides and nutrients. Although the Project will include appropriate trash disposal and collection facilities, littering and accidental releases of trash could result in trash being carried to receiving waters, causing adverse effects to water quality. The long-term degradation of runoff stormwater from Project operation could adversely affect water quality in receiving waters.

Stormwater runoff during operation of the Project will be subject to the NPDES permit requirements. The NPDES program’s objective is to control and reduce pollutant discharges to surface water bodies. Compliance with NPDES permits is mandated by federal and State statutes and regulations, and locally overseen by the San Francisco Bay Regional Water Quality Control Board (RWQCB).In 2015, the RWQCB re-issued prior countywide municipal stormwater permits as one Municipal Regional Stormwater NPDES Permit to regulate stormwater discharges from several municipalities and local agencies in the Bay Area for the discharge of stormwater runoff from the Municipal Separate Storm Sewer Systems (MS4s). The cities of Alameda, Albany, Berkeley, Dublin, Emeryville, Fremont, Hayward, Livermore, Newark, Oakland, Piedmont, Pleasanton, San Leandro, and Union City, and the County of Alameda Flood Control and Water Conservation District, and Zone 7 joined together to form the Alameda Countywide Clean Water Program (ACCWP). Together, the ACCWP is a permittee under the San Francisco Bay Municipal Regional Stormwater Permit (MRP).[32]

Pursuant to this MRP, new development projects that create 10,000 square feet or more of impervious surface, including development projects on public or private land (e.g., the Project) fall under the planning and building authority the ACCWP. Provisions of the MRP enable the ACCWP to use its planning authority to require appropriate source control, site design and stormwater treatment measures in new development and redevelopment projects to address stormwater runoff pollutant discharges and prevent increases in runoff flows. This goal is to be accomplished primarily through the implementation of low impact development (LID) techniques. Pursuant to regulations collectively known as C.3

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[32] California Regional Water Quality Control Board, San Francisco Bay Region - Municipal Regional Stormwater NPDES Permit (Order No. R2-2015-0049, NPDES Permit No. CAS612008), November 19, 2015

Provisions, each regulated project is required to implement at least the following design strategies onsite:

- Limit disturbance of natural water bodies and drainage systems, minimize compaction of highly permeable soils, protect slopes and channels, and minimize impacts from stormwater and urban runoff on the biological integrity of natural drainage systems and water bodies
- Conserve natural areas, including existing trees, other vegetation and soils, and
- Minimize impervious surfaces, disturbances to natural drainages and stormwater runoff by implementing one or more site design measures

Each regulated project is required to 100% of the amount of runoff with LID treatment measures on-site, or with LID treatment measures at a joint stormwater treatment facility. LID treatment measures include rainwater harvesting and use, infiltration, evapotranspiration, and bio-treatment through rain gardens, bio-retention units, bio-swales and planter/tree boxes.

The Project will be required to comply with all applicable stormwater control regulations detailed under the NPDES MRP permit. Compliance with the MRP provisions will satisfy the requirements of Prior EIR **Mitigation Measure 4.7-1** (which requires individual development projects to comply the post-construction stormwater management requirements of the appropriate NPDES permit), and will reduce potential operation phase impacts on water quality to a less-than-significant level.

Otherwise Substantially Degrade Water Quality

Project Assessment

Other than potential impacts associated with stormwater runoff and construction-period dewatering (as fully discussed under those separate topic areas), the Project would not result in any substantial changes to onsite water quality. The Project will be required to adhere to all construction and operation-phase stormwater permit requirements (NPDES Construction General Permit and Municipal General Permit), which would reduce potential impacts to water quality to a less-than-significant level.

Violation of any Water Quality Standards or Discharge Requirements

Project Assessment

The Project will be required to adhere to all construction and operation-phase stormwater permit requirements (NPDES Construction General Permit and Municipal General Permit), which would reduce potential impacts to water quality to a less-than-significant level.

Groundwater

Project Assessment

The Project would not involve use or extraction of groundwater. Dewatering may be required during construction activities, but this activity would be temporary and would affect only the uppermost water-bearing zone, and not the deeper, regional aquifer. Therefore, the Project would not deplete groundwater supplies or interfere substantially with groundwater recharge and impacts to groundwater supplies or recharge would be less-than-significant.

Alteration of Drainage Patterns or a Watercourse

Project Assessment

The Project would not alter the course of an on-site or off-site channel, stream, or river. Construction could temporarily alter the existing drainage pattern at the site, but compliance with construction-phase stormwater requirements consistent with the requirements of Mitigation Measures 4.7-2 and 4.7-3of the Prior EIR (see above) would ensure that construction of the parking structure would not result in substantial erosion or siltation on or off site. Operationally, the Project would increase impervious surface area relative to pre-project conditions. Stormwater from the parking structure would be collected on each floor and discharged to a sewer system and not to the existing stormwater drainage system. The local sewer system has been determined to have adequate capacity to accommodate the Project's increase in runoff as well as cumulative development within the DTC. This impact would be less-than-significant.

Increased Surface Runoff / Drainage System Capacity

Prior EIR Conclusions

The Prior EIR concluded that development of the DTC would introduce new impervious surfaces (primarily buildings, driveways, parking structures, roads and hardscape elements) onto the then vacant portions of the site, increasing stormwater runoff. The Prior EIR assumed the easterly portion of the DTC site (including the Project site, or Site D-1) would be developed with up to 36 acres of new impervious area. Drainage from the easterly portion of the DTC drains to existing 36" diameter storm drain pipes in Campus Drive and Altamirano Avenue and then connecting to a box culvert on Site D-2 at I-580. The box culvert was built by Caltrans, and is now maintained by Caltrans as part of the I-580 freeway. This box culvert drains to the Zone 7 Line G-2 south of I-580, and from there to Chabot Channel, then to Arroyo Mocho in the City of Pleasanton and ultimately enters San Francisco Bay through the Coyote Hills Slough near the City of Fremont. The drainage system south of I-580 is owned and maintained by the Alameda County Flood Control and Water Conservation District. The Prior EIR indicates that the existing box culvert at Site D-2 has adequate capacity to convey anticipated future storm flows from this area. The Prior EIR did not find this impact to be significant.

Project Assessment

The Project will change more than one 1 acre of permeable undeveloped ground to impervious surface, which could alter drainage in the area by reducing the amount of natural percolation into the soils and increasing surface runoff. The Project's increase in impervious surface represents approximately 3 percent of the increase in impervious surface expected to occur within the easterly portion of the DTC area, assuming that all sites within the easterly DTC area develop per the DTC Plan. Drainage from the Project site will drain to existing 36" diameter storm drain pipes in Campus Drive and Altamirano Avenue and then connecting to the existing box culvert on Site D-2 at I-580 (southeast of the Project site). During the design stage, hydraulic calculation will be provided verifying that the existing 36" pipes are adequately sized. The Prior EIR found that the existing stormwater infrastructure, and particularly the box culvert on Site D-2, has capacity to accommodate increased stormwater flows from the Project as well as all other cumulative development within the DTC, and expansion of the system would not be necessary to accommodate increased flows. Impacts of the Project resulting from increased surface runoff and downstream stormwater conveyance capacity would be less-than-significant.

Flooding-Related Issues

Prior EIR Conclusions

The Prior EIR concluded that the DTC site is located outside of any 100-year flood plain. The DTC site is within a 500-year flood hazard area (Zone X), and a portion of the DTC is included in the 100-year flood hazard area as mapped by FEMA. However, with installation of new stormdrain facilities in the area, potential flood damage to buildings would be unlikely.

Project Site Assessment

Housing is not a part of the Project, so no impact related to placement of housing in a 100-year flood hazard area would occur. No portion of the Project site is within a 100-year flood hazard area (portions of the Project site are within the 500-year flood hazard area),[33] so the potential of the Project to place structures within a 100-year flood hazard area that would impede or redirect flood flows is less-than-significant. The Project site is not located within a mapped dam failure inundation area, and there are no levees protecting the site from flooding. There is no potential risk at the Project site of hazards from a seiche, tsunami or from sea level rise or mudflows. The potential for the Project to be subject to a significant risk of loss, injury, or death involving flooding is less-than-significant.

Conclusion

This review of the Project demonstrates there are no changed circumstances that alter the conclusions of the Prior EIR regarding hydrology and water quality impacts. Certain information regarding hydrology conditions in the area is based on the Prior EIR, and/or the 2016 BART Addendum, and available public agency maps and reports. No significant changes in hydrologic conditions at or near the Project site have since occurred, that would invalidate the findings of the Prior EIR analysis or relevance to the Project. There is no new information about the Project that would alter the findings of the Prior EIR analysis. The Prior EIR relies on compliance with NPDES permit requirements to reduce construction period and operational impacts to water quality to a less-than-significant level. Although these permit requirements have changed substantially since certification of the Prior EIR (as was anticipated in the Prior EIR mitigation measures), these changes result in greater water quality protections and more rigorous monitoring and enforcement requirement, and would not allow for a new significant water quality impact or an increase in the significance of water quality impacts.

Nothing about the Project as a parking garage would result in a new or more severe environmental effect related to hydrology or water quality than if the site were developed as an office or hotel use as analyzed in the Prior EIR. The Project's impacts related to hydrology and water quality are generally consistent with impacts otherwise attributed to an office or hotel development as assumed for Site D-1 in the Prior EIR, and no new or substantially more severe impacts would result. Although the Prior EIR did not fully address all current topics related to hydrology and water quality as itemized in the 2018 CEQA Guidelines Environmental Checklist, the Project would not have new impacts related to these topics. The Project would not result in any new significant impacts not previously identified in the Prior EIR, nor would it substantially increase the significance of such impacts previously identified

[33] City of Dublin General Plan, Potential Flooding (FEMA Flood Insurance Rate Map, Figure 8-2, 2013

The Project will be required to comply with all NPDES permit requirements, including those of the applicable General Construction Permit and MS4 Regional Municipal Permit, effectively implementing **Mitigation Measures 4.7-1, 4.7-2 and 4.7-3** from the Prior EIR.

	New or More Severe Significant Impact	Not a New Impact, Requires Mitigation from DCT EIR	No Impact / Less than Significant
X. Land Use and Planning			
Would the project:			
a) Physically divide an established community?	☐	☐	☑
b) Fundamentally conflict with applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect and actually result in a physical change in the environment?	☐	☐	☑
c) Fundamentally conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☑

Land Use Consistency

<u>Prior EIR Conclusions</u>

The Prior EIR determined that the land use and planning impacts associated with approval of the DTC would be less-than-significant, and no mitigation measures were required. The types and intensities of land uses within the DTC were found to be generally consistent with surrounding land uses. These surrounding land uses include various uses within Camp Parks to the north, light industrial and service commercial uses to the west (across Iron Horse Trail), planned and approved campus office uses to the east (within the Eastern Dublin Specific Plan), and offices to the south (in the Hacienda Business Park in Pleasanton. Approval and implementation of General Plan and Specific Plan amendments and re-zonings rendered the DTC consistent with the goals and policies of the Dublin General Plan, Eastern Dublin Specific Plan and the Dublin Zoning Ordinance. The Prior EIR found the DTC Plan to represent a balanced mix of residential, commercial and office uses planned as an integrated unit.

The DTC Plan includes approximately 8.65 acres zoned as Public/Semi-Public, primary at the BART station but also for a bus transfer station and a 1,700 parking-space garage for BART patrons. The parking garage was to replace approximately 1,700 surface parking spaces, increasing the total permanent parking available to BART patrons by approximately 500 spaces. The BART parking structure that was ultimately approved was to be constructed in two phases. Phase 1 was intended to be a 1,528-space structure, and Phase 2 was to be a 655-space expansion to be constructed by BART on BART property. The Phase 1 parking structure (as built) contains 1,512 parking spaces, or slightly less than the number approved. Preliminary plans for a 655-space Phase II parking structure expansion were prepared, but not constructed.

The DTC Plan designates the Project site as Campus/Office, and the Prior EIR assumed development of up to a ten-story office or hotel use on this site.

Project Assessment

The Project is intended to address an existing unmet demand for additional parking at the Dublin/Pleasanton BART Station. According to the 2016 BART Addendum, all existing parking spaces at the Phase 1 garage are 100% occupied, and are typically filled by approximately 7:30 a.m. This limits the ability of additional BART patrons to access the regional transit system, reducing potential BART ridership and increasing commute vehicle traffic on Bay Area roadways. The Project would provide additional parking for BART patrons, improving access to the transit system. The BART Phase 1 garage plus the Project's 570-space garage would accommodate a total of 2,082 parking spaces, or about 100 fewer parking spaces than were ultimately approved.

The Project would reduce the potential for new Campus/Office land uses within the DTC by approximately 1 acre, occupying the easterly half of the 2.4-acre D-1 Site. The balance of the D-1 Site adjacent to Iron Horse Parkway will remain available for potential Campus/Office development in the future. The land use implications of constructing a supplemental parking garage on the north side of the existing BART garage versus the south side are not significant.

Physically Divide an Established Community

Prior EIR Conclusions

The Prior EIR concluded that it was likely that improvement to roads, construction of other transportation improvements, utility excavations, and other similar construction activities could temporarily disrupt some access routes, including access to the BART station. However, these disruptions would occur on a short-term basis and would not be significant.

Project Assessment

The Project would occupy an existing parcel of land that is served and accessed by existing streets within the DTC. The Project is not a physical boundary (such as a freeway) that would hamper movement between or within the existing community and it would not change or impede existing access to or within the DTC. The Project would complete the construction of Campus Drive from Altamirano to Martinelli Way, adding local roadway capacity and facilitating local circulation and would improve and expand use of the BART system by providing additional parking supply.

Conflict with an Applicable Land Use Plan Adopted to Avoid or Mitigate an Environmental Effect

Prior EIR Conclusions

The DTC was planned as phased development project. Prior to the approval of individual development projects within the DTC, project-specific Stage 2 Planned Development re-zonings, Site Development Reviews, and environmental reviews consistent with the Prior EIR and in accordance with CEQA would be required by the City of Dublin. Through this project-specific review, the City of Dublin and other affected agencies could ensure, through normal planning review procedures that no impacts would occur with regard to long-term operational impacts of the DTC.

Project Assessment

Pursuant to the Letter Agreement between the City of Dublin and the County of Alameda GSA,[34] the City has waived provisions originally set forth in the 1992 Annexation Agreement which would otherwise require review and approval of the Project by the City of Dublin. Based on the terms of the Letter Agreement, the County may approve and proceed with Project implementation without having to process a General Plan Amendment or rezoning that would otherwise be required because of the proposed use of the D-1 site as a parking garage (Public/Semi-Public Use) and not a Campus/Office use. The County of Alameda and the Alameda County Surplus Property Authority (ACSPA) have long been active partners with BART and the City of Dublin in developing the DTC Plan, and implementing that Plan through property transfers and joint planning efforts. The County of Alameda recognizes the City's legitimate interests in certain planning aspects of the Project, and the Letter Agreement reached between the City and the County sets forth the City's concerns and limits the City's oversight and involvement to one of consultation. Pursuant to the Letter Agreement, the City has acknowledged that the parking garage Project is an acceptable land use for the D-1 Site. The City's primary concerns pertain to the aesthetic appearance of the structure, to ensuring that the Project include measures to prevent light and glare from adversely affecting existing or future development, and that the garage not be designed in a manner detrimental to future uses on the balance of the DTC. The Letter Agreement provides the City with a reasonable opportunity for review and comment on the design and exterior appearance of the Project before architectural details are finalized.

Conflict with any Applicable HCP or NCCP

Project Assessment

The Project site is not within an area that is subject to a habitat conservation plan (HCP) or natural community conservation plan (NCCP). The Project would have no conflict or impact under this topic.

Conclusions

This review of the Project demonstrates there are no changed circumstances that alter the conclusions of the Prior EIR regarding land use impacts. Although many portions of the DTC have now been constructed since certification of the Prior EIR, no significant land use changes have occurred that would invalidate the findings of the Prior EIR analysis or relevance to the Project. The Project does represent a change regarding the use of the D-1 Site, but this change in land use does not substantially alter the findings of the Prior EIR land use analysis. Nothing about the Project as a parking garage would result in a new or more severe land use effects than if the site was developed as an office or hotel use as analyzed in the Prior EIR, and no new or substantially more severe impacts would result. The Project would not result in any new significant impacts not previously identified in the Prior EIR, nor would it substantially increase the significance of such impacts previously identified.

[34] Letter Agreement, Op. Cit.

	New or More Severe Significant Impact	Not a New Impact, Requires Mitigation from DCT EIR	No Impact / Less than Significant
XI - Mineral Resources			
Would the project:			
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☑
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☑

Mineral Resources

Prior EIR Conclusions

The initial Study for the Prior EIR determined that mineral resources would not be affected by the DTC, and were not analyzed further in that EIR.

Project Assessment

The Project site is not underlain by significant mineral resources, and unusual quantities of mineral resources are not needed for development of the Project or the DTC. Implementation of the Project would not have an impact on mineral resources.

Conclusion

There is no change in circumstances or new information that would alter the conclusions of the Prior EIR regarding mineral resources. Nothing about the Project as a parking garage would result in a new or more severe mineral resource effect than if the site was developed as an office or hotel use as analyzed in the Prior EIR. The Project would not result in impacts to mineral resources not previously identified in the Prior EIR, or change the level of impact previously identified. The Project would have no impact on mineral resources.

	New or More Severe Significant Impact	Not a New Impact, Requires Mitigation from DCT EIR	No Impact / Less than Significant
XII. NOISE			
Would the project result in:			
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☑	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☑
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☑	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☑
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☑
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☑

Construction Period Noise

<u>Prior EIR Conclusions</u>

The Prior EIR concluded that future residents of the DTC could be subject to short-term but potentially significant noise due to construction of other buildings and improvements. Typical noise generated by construction activities include earthmoving, truck traffic, back-up bells, air compressors, hammering and other mechanical equipment normally used during construction. Construction of higher rise office buildings may also necessitate pile driving. Short-term noise impacts will be the greatest for those residences planned to be located closest to the Campus/Office portion of the DTC and, depending upon specific operations undertaken by project developers and contractors, could reach significant levels at times. To address these impacts, the Prior EIR included Mitigation Measure 4.9-1, which was found to reduce construction-period noise impacts to less-than-significant levels.

> **Mitigation Measure 4.9-1** (construction noise impacts): Individual project developers shall submit a Construction Noise Management Plan that identifies measures to be taken to minimize construction noise on surrounding developed properties, particularly residential developments. Noise

Management Plan shall be approved by the City of Dublin Community Development and Public Works Departments prior to issuance of grading permits. This Plan shall contain, at a minimum, a listing of hours of construction operations, use of mufflers on construction equipment, limitation on on-site speed limits, identification of haul routes to minimize travel through residential areas and identification of a noise monitor. Specific noise management measures shall be included in appropriate contractor specifications.

Project Assessment

Project construction is expected to occur over a period of approximately 12 months and would temporarily increase noise levels in the vicinity. Construction noise levels would vary from day to day depending on the amount and condition of the equipment being used, the types and duration of activity being performed, the distance between the noise source and the receptor, and the presence or absence of barriers between the noise source and receptor. Excavation, grading, and foundation work are typically the noisiest phases of construction. The later phases of construction include activities that are typically quieter and that occur within the building under construction, thereby providing a barrier for noise between the construction activity and nearby receptors. Pile driving is not expected to be required for construction of the Project.

Residential uses are located immediately across Iron Horse Parkway from the Project site, on the northwest corner of Martinelli Way and Iron Horse Parkway, and immediately north of the Project site on the north side of Martinelli Way, east of Iron Horse Parkway. No existing barrier between the Project and these residences is present. To address construction-period noise impacts associated with the Project, the County of Alameda GSA and its design/build contractor shall prepare and implement a Construction Noise Management Plan that provides equal or better noise reduction than those measures specified in Prior EIR **Mitigation Measure 4.9-1**. This Noise Management Plan shall identify Project specific noise control measures to minimize construction noise on surrounding developed properties, particularly those immediately adjacent residences. Implementation of this mitigation measure will reduce construction noise impacts to a less-than-significant level.

Operational Noise

Prior EIR Conclusions

The Prior EIR concluded that residential uses constructed near Dublin Boulevard or the I-580 freeway, and near the BART line, would be exposed to future noise levels considered conditionally acceptable or normally unacceptable. Employees within Campus/Office buildings, depending on their location, may also be subject to conditionally acceptable to normally unacceptable levels of noise. For the residential portions of the DTC, average day/night noise levels (DNL) is expected to range from approximately 68 to 75 dB. Noise impacts would generally be greater at upper floors due to the elevated nature of the freeway. However, the development plan for the DTC is designed to locate land uses that are sensitive to noise impacts (i.e., residential units and the Village Green) away from the I-580 freeway and BART tracks and to shield noise sensitive uses with taller office buildings to assist in minimizing permanent noise impacts. To address the issue of noise sensitive land uses located in an area subject to traffic and transit-related noise sources, the Prior EIR included three mitigation measures found to reduce these impacts to less-than-significant levels:

Mitigation Measure 4.9-2a (permanent noise impacts for residential uses):For all residential uses within the DTC, site-specific acoustic reports shall . . . list specific measures to reduce both interior and exterior noise levels to normally acceptable levels . . .

Mitigation Measure 4.9-2b (permanent noise impacts to non-residential uses): For commercial projects where noise levels on a majority of the site are projected to be normally unacceptable (greater than 75 dB DNL) the developer shall . . . include detailed identification of noise exposure levels and a listing of specific measures to reduce both interior and exterior noise levels to normally acceptable levels . . .

Mitigation Measure4.9-2c (permanent noise impacts to non-residential uses): For commercial projects in areas where noise levels are projected to be conditionally acceptable or normally acceptable (i.e., 75 dBA DNL or less) on a majority of the site, the developer shall . . . include noise reduction features in the building design to ensure acceptable interior noise levels.

These mitigation measures place the responsibility for mitigating noise exposure of new development on the new noise sensitive land uses, acknowledging that traffic and transit-related noise within the DTC was expected to be significant, and to increase over time.

The 2016 BART Addendum analyzed a similarly sized parking structure proposed (but not ultimately constructed) on the immediate south side of the existing BART parking garage. That analysis concluded that parking garage proposed in 2016 would not generate significant increases in traffic noise at any analyzed roadway segments. The roadway segments analyzed included:

- Gleason Boulevard east of Hacienda Drive, where existing ambient noise levels were found to be less than 60 dBA CNEL
- Hacienda Drive south of Gleason Boulevard, where existing ambient noise levels were found to be less than 60 dBA CNEL, and
- Iron Horse Parkway south of Martinelli Way, where the 2016 proposed parking garage would contribute the highest project-generated traffic volume and where ambient noise levels exceeded 60 dBA CNEL

The analysis included in the 2016 BART Addendum found that traffic generated by the then-proposed parking garage would not generate new traffic noise that would exceed a threshold of 58 dBA Leq at locations where ambient noise levels are 60 dBA CNEL or less. It also found that the then-proposed parking garage would not exceed a threshold of 61 dBA Leq at locations where ambient noise levels are 60 dBA CNEL or more. Traffic noise impacts were concluded to be less-than-significant.

Project Assessment

The Project does not include any new noise-sensitive uses. People who park in the garage would leave once they have parked their cars. No mitigation is required to reduce cumulative traffic and transit-related noise impacts on the Project.

Parking Garage Operations

In September 2018, the Federal Transit Administration published an updated Transit Noise and Vibration Impact Assessment Manual, which also includes a Noise Impact Assessment Spreadsheet.[35] The Spreadsheet provides a screening procedure to identify when a transit-related project may have the potential to generate significant noise impacts. The screening procedure accounts for impact criteria, various types of transit-related projects (including parking garages), and surrounding noise-sensitive land uses. The screening procedure is intended to be conservative so that it broadly captures the potential for impacts, and assumes operations under relatively high-capacity conditions, which produce more noise than normal operating conditions. This Noise Assessment Spreadsheet has been used to provide a screening-level assessment of the Project. Several conservative assumptions were used in this assessment, including:

- Existing noise levels along Dublin Boulevard and Iron Horse Parkway are assumed at approximately 68 dB CNL, approximately 2 dB less than the projected future noise levels as projected in the Prior EIR at buildout
- The distance to sensitive residential receivers (apartments immediately across Iron Horse Parkway and Martinelli Way) is estimated at 80 feet from the Project, not accounting for any setback at the Project site
- The parking garage is assumed to be fully occupied by 7:30 in the morning, assuming that 75% of all parkers will arrive before 7:00 AM (i.e., during the nighttime noise period as used in calculating Ldn), and 25% of parkers will arrive between 7:00 and 7:30 AM (i.e., during the daytime period as used in calculating Ldn). Nighttime Ldn calculations increase the perceived effect of nighttime sound to recognize the greater sensitive to noise during these times of the day.

The results of the Noise Screening procedure (see **Appendix D**) indicate that the Project would generate an average noise exposure of 63 dBA at the nearest noise sensitive receivers, increasing the existing noise levels from 68 dBA to 69 dBA, or 1 dBA increase. An increase of one dBA is not a significant or noticeable increase in noise levels. This 1 dBA increase would not increase ambient noise levels at sensitive receivers to over70 dB, as the Prior EIR projected would occur under cumulative buildout conditions.

Project-Related Traffic Noise

The Project is a similarly sized parking garage located in relatively close proximity to the parking garage that was analyzed in the 2016 BART Addendum. As indicated in the Traffic analysis included as part of this CEQA document, the traffic characteristics of the Project are also very similar to those analyzed in the 2016 BART Addendum. There is nothing about the Project that would indicate that its traffic characteristics would be substantially different than the traffic characteristics analyzed in the 2016 BART Addendum, and the Project's contribution to traffic noise would be similarly less-than-significant.

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[35] FTA, Transit Noise and Vibration Impact Assessment Manual. September 2018, accessed at: https://www.transit.dot.gov/regulations-and-guidance/environmental-programs/noise-and-vibration

Groundborne Vibration or Groundborne Noise Levels

Prior EIR Conclusions

Groundborne vibration and groundborne noise levels were not addressed in the Prior EIR but were addressed in the 2016 BART Addendum. The BART Addendum concluded that construction of the then-proposed parking garage (including use of vibratory rollers, bulldozers and large trucks) would not generate vibration levels at nearby apartments and condominiums that would exceed the infrequent event noise threshold of 80-VdB and would not generate vibration levels exceeding a threshold of 0.3 in/second. Based on the analysis presented in the 2016 BART Addendum, construction of that parking garage did not have the potential to generate vibration levels that would disturb persons, and the impact was found to be ess-than-significant.

Project Assessment

Similar to the BART Phase II parking garage, the Project would not involve any activities or equipment with the potential to generate excessive groundborne vibrations. The potential for the Project to expose persons to excessive groundborne vibration or groundborne noise levels is less-than-significant.

Substantial Permanent Increase in Ambient Noise

Prior EIR Conclusions

The 2016 BART Addendum specifically analyzed cumulative traffic noise levels generated by past, present and probable future projects, finding significant cumulative noise affects along local roadways. Roadways receiving the highest level of increased cumulative traffic, and therefore the greatest increase in cumulative traffic noise would occur along:

- Scarlett Drive east of Dougherty Road (an increase of 9.1 dBA Leq in the AM and 10.7 dBA Leq in the PM)
- Arnold Road south of Dublin Road (an increase of 6.3 dBA Leq in the AM, and 5.5 dBA Leq in the PM)
- Martinelli Way east of Iron Horse Parkway (an increase of 5.4 dBA Leq in the PM),
- Arnold Road north of Martinelli Way (an increase of 5.1 dBA Leq in the PM), and
- Iron Horse Parkway south of Dublin Boulevard (an increase of 4.3 dBA Leq during the PM peak hour)

With the exception of Iron Horse Parkway south of Dublin Boulevard (which is below the cumulative threshold of a 5dBA increase), the cumulative traffic noise increase along these other four roadways was found to be a significant cumulative impact. Traffic noise increases along other roadway segments was found to be less than 4.3dBA Leq, and therefore below the cumulative impact threshold.

The 2016 BART Addendum also found that only 0.5 dBA or less of the cumulative noise increase along these roadway segments was attributable to the BART Phase II parking garage. The BART Phase II parking garage was found to have a less-than-significant (less than 3 dBA) contribution to cumulative traffic noise increases.

Project Assessment

The Project is a similarly sized parking garage located in relatively close proximity to the parking garage analyzed in the 2016 BART Addendum. As indicated in the Traffic analysis in this CEQA document, the traffic characteristics of the Project are also very similar to those analyzed in the 2016 BART Addendum. There is nothing about the Project that would indicate that its traffic characteristics would be substantially different from the traffic characteristics analyzed in the 2016 BART Addendum, and the Project's contribution to cumulative traffic noise would be similarly less-than-significant.

Excessive Airport-related Noise

Prior EIR Conclusions

The Prior EIR disclosed that helicopters are used within Camp Parks as part of on-going operations of that facility. The US Army's Environmental Noise Management Plan (December 2000) identified properties within 1,000 feet of the boundary of the Camp Parks facility as being within a "helicopter noise impact area".

The DTC is not located within an adversely affected noise contour of the Livermore Municipal Airport, and is not located in proximity to a private airstrip that would generate potentially significant noise effects on DTC land uses.

Project Analysis

The Project is not a noise sensitive use that would be adversely affected by ambient noise levels from aircraft or helicopter overflights. This impact is less-than-significant for the Project.

Conclusion

This review of the Project demonstrates there are no changed circumstances that significantly alter the conclusions of the Prior EIR regarding long-term noise impacts. The Prior EIR analyzed a future condition at buildout of the DTC, which has not yet occurred. No significant changes in expected noise sources at or near the Project site have since occurred that would invalidate the findings of the Prior EIR analysis or relevance to the Project. There is no new information about the Project that would alter the findings of the Prior EIR analysis. The 2016 BART Addendum does provide new and more detailed information that is relevant to the Project, but this new and more detailed information does not indicate a new or more severe noise impact than what was disclosed in the Prior EIR.

Nothing about the Project as a parking garage would result in a new or more severe noise effect than if the site were developed as an office or hotel use as analyzed in the Prior EIR. The Project's individual noise effects are demonstrated to be less-than-significant. Although the Prior EIR did not fully address all current topics related to noise as itemized in the 2018 CEQA Guidelines Environmental Checklist, the Project would not generate any new impacts related to these topics.

The Project will be required to comply with all construction-period noise reduction measures as specified in **Mitigation Measures 4.9-1.** As a non-sensitive land use, the Project would not be required to implement Mitigation Measure 4.9-2b or -2c.

	New or More Severe Significant Impact	Not a New Impact, Requires Mitigation from DCT EIR	No Impact / Less than Significant
XIII. Population and Housing			
Would the project:			
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☑
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☑
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☑

Employment

Prior EIR Conclusions

THE Prior EIR concluded that the DTC would generate approximately 7,692 permanent jobs at full buildout, plus short-term construction jobs. This amount of employment growth was generally accounted for in ABAG's regional employment projections. Since this amount of employment growth was planned as part of a mixed-use, transit-oriented project that can draw on the entire Bay Area region, less-than-significant impacts were expected.

Project Analysis

If the Project were to convert the entire D-1 Site from Campus/Office to a parking garage, it could result in a reduction of approximately 653 employees, or approximately 8% of the total employment anticipated in the Prior EIR. However, the Project anticipates development of only the easterly half of the D-1 Site, such that additional employment-generating campus, office or hotel use could still be accommodated in the westerly portion of this site. The reduction in employment potential of the DTC resulting from the Project would be less-than-significant.

Jobs-Housing Balance

Prior EIR Conclusions

The Prior EIR found that the DTC would contribute to a projected jobs-housing imbalance in the City of Dublin and in Eastern Alameda County, with more jobs available in the community in relation to employed residents. The DTC was considered to assist in reducing transportation impacts associated with a new major employment center because future employment at the DTC would be sited near BART, a major transit hub, and because the DTC would contain a significant housing component.

Project Analysis

The reduction in total employment potential within the DTC resulting from the Project would not adversely affect the job/housing ratio in the City of Dublin or in Eastern Alameda County, where more jobs are already available in the community in relation to employed residents.

Displacement

Project Analysis

There are no residential units or business on the D-1 Site, and the Project would not displace any people or housing, or necessitate construction of replacement housing elsewhere.

Conclusion

This review of the Project demonstrates there are no changed circumstances that significantly alter the conclusions of the Prior EIR regarding population or housing. Site D-2, E-2 and the westerly portion of the Project site (Site D-1) will remain available for potential future Campus/Office development. Site E-1 was previously converted form Campus/Office to permit new residential development. No other significant changes are expected at or near the Project site that would invalidate the findings of the Prior EIR analysis or relevance to the Project pertaining to population or housing. There is no new information about the Project that would alter the findings of the Prior EIR analysis. As a parking garage, the Project would not increase employment as compared to developed as an office or hotel use as analyzed in the Prior EIR. The Project's effects related to population and housing would be less-than-significant.

	New or More Severe Significant Impact	Not a New Impact, Requires Mitigation from DCT EIR	No Impact / Less than Significant
XIV. Public Services —			
a) Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:			
i) Fire protection?	☐	☐	☑
ii) Police protection?	☐	☐	☑
iii) Schools?	☐	☐	☑
iv) Parks?	☐	☐	☑
v) Other public facilities?	☐	☐	☑

Public Services

Prior EIR Conclusions

The Prior EIR determined that new development within the DTC would:

- increase the number of calls for service for fire protection and emergency medical response
- require specialized fire equipment and fire protection procedures for new office buildings greater than six stories in height
- increase calls for police services, specifically regarding traffic control, burglary, theft and neighborhood and domestic disturbances at the residential portion of the DTC
- increase concerns regarding coordination of security protocol between future site users and the Dublin Police Services Department, and
- would generate an estimated 90 new elementary school students, 45 middle school students and 15 high school students that would need to be accommodated by the Dublin Unified School District, requiring cumulative construction of new school facilities

The Prior EIR included mitigation measures capable of reducing these impacts to less-than-significant levels.

Mitigation Measure 4.12-1 (Fire protection): Proposed high rise buildings (greater than 6 stories feet in height) shall incorporate augmented fire protection measures, including but not limited to caches of fire- fighting equipment on upper floors and other project-specific measures as identified by the Alameda County Fire Marshal.

Mitigation Measure 4.12-2 (police services): Individual buildings and/or complexes of buildings proposed for construction within the Transit Center shall submit a safety and security plan for the approval of the Police Chief. Safety and Security Plans shall include but not be limited to provision for private security measures, methods to achieve coordination with the Dublin Police Services Department and other items as deemed important by the Dublin Police Services Department.

Mitigation Measure 4.12-3 (schools): Prior to issuance of the first building permit within the Transit Center, the project proponent shall enter into a school mitigation program with the Dublin Unified School District to ensure that future land uses within the Transit Center pay a fair share towards off-setting costs for new school facilities within the District. Developers of individual projects within the Transit Center shall be required to pay mitigation fees, as specified in the mitigation agreement, at time of building permit issuance by the City of Dublin.

Project Analysis

Fire Protection

The Project will be designed, constructed and inspected to ensure conformity with the Uniform Fire Code and emergency response access standards of the Alameda County Fire Department (ACFD). The Project will also have an internal fire suppression system. The Project would result in a minor incremental increase in demand for fire protection services, but the site is in a highly developed area in close proximity to existing fire protection services, and does not require new or expanded fire facilities. The Project would not substantially affect response times for fire services. The Project's impact to the provision of fire services would be less-than-significant.

The Project is also not a high-rise building (defined in the DTC as greater than 6 stories in height), such that Prior EIR **Mitigation Measure 4.12-1** is not applicable. However, if necessary to comply with emergency response standards of the ACFD, the Project may incorporate caches of fire-fighting equipment on upper floors of the garage and other Project-specific measures as may be identified by the Alameda County Fire Marshal.

Police

The Project would result in an incremental increase in demand for police services. This increased demand will not be substantially greater than the existing demand for police services in the area. The Project would have a less-than-significant impact on police protection services. To address cumulative police service impacts, the Project will prepare a safety and security plan to assure compliance with applicable standards and coordination with Dublin Police, generally consistent with Prior EIR **Mitigation Measure 4.12-2**.

Schools

The Project will not create new residences and will not generate new students. The Project would not be subject to development impact fees for schools because the Project does not meet the criteria for this fee program. The Project's impact would be less-than-significant.

Parks and Recreation

The Project will not create new residences, office space or other uses that directly or indirectly increase the demand for park facilities. The Project will not result in the need for new or expanded park facilities, and the Project's impact would be less-than-significant.

Conclusions

This review of the Project demonstrates there are no changed circumstances that significantly alter the conclusions of the Prior EIR regarding impacts on public services. No significant changes in expected public service demands at or near the Project site have since occurred that would invalidate the findings of the Prior EIR analysis or relevance to the Project. There is no new information about the Project that would indicate a new or more severe impact on public services than disclosed in the Prior EIR. Nothing about the Project as a parking garage would result in a new or more severe effect on public services than if the site were developed as an office or hotel use as analyzed in the Prior EIR. The Project's individual effects on public services would be less-than-significant and the Project would not generate any new impacts related to these topics.

The Project will be subject to review by the Alameda County Fire Marshal and may need to implement certain safety measures generally consistent with certain provisions of Prior EIR Mitigation Measure 4.12-1. Further, the Project will prepare a safety and security plan to assure compliance with applicable standards and coordination with Dublin Police, generally consistent with Prior EIR Mitigation Measure 4.12-2.

	New or More Severe Significant Impact	Not a New Impact, Requires Mitigation from DCT EIR	No Impact / Less than Significant
XVI. Transportation/Traffic			
Would the project:			
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☑
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☑
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☑
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☑
e) Result in inadequate emergency access?	☐	☐	☑
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☑

Trip Generation

Prior EIR Conclusions

The Prior EIR Technical Appendix includes calculation of expected vehicle trip generation pursuant to DTC development, reproduced below in **Table 3**.[36]

[36] DTC EIR, Appendix C, *Consultant's Report on the Transportation Impacts of the Proposed DTC*, prepared by Omni-Means, LTD, Table 3, page 27

Table 3: DTC Trip Generation (per Table 3 of Prior EIR Technical Appendix)			
Land Use Type	Daily Trips	AM Peak Hour Trips	PM Peak Hour Trips
Campus/Office	13,120	2,500	2,360
Residential Apartments	7,455	570	705
BART Parking	5,830	904	724
Retail	2,847	181	181
Total:	29,252	4,155	3,970

Notes:

Trip Generation rates per ITE Trip Generation, 6th Edition

Office trips reduced by 15% to account for residential/office interaction and use of transit

Residential trips reduced by 25% due to proximity to East Dublin BART station

Trip rates for BART parking structure based on peak period counts conducted in November 2000

As noted in the Prior EIR Appendix, the retail component of DTC land uses were considered ancillary to office space, provided to serve the needs of the adjacent office workers. The retail land uses were not expected to generate external vehicle trips. The BART parking structure was also found to not add any new traffic. There were approximately 1,680 surface parking lot spaces for the BART station in the DTC, to be replaced by the 1,680-space BART parking structure. The BART trips were assumed as existing vehicle trips re-distributed based on the street network serving the BART parking structure. Removing the retail and BART parking trips from the total shown in Table 3 above, results in an expected 20,575 daily trips generated by the DTC, with 3,070 during the AM peak hour and 3,065 during the PM peak hour.

Project Analysis

The Project is not considered a trip generating land use. Parking garages are assumed to accommodate the parking demands of other adjacent land uses that do generate travel demands. The Project would provide parking options for BART patrons who otherwise would drive to their destinations, most of which will not be in the DTC. However, as these BART patrons exit the freeway or arrive from other local destinations, they will be using the local roadway network and adding cars to local intersections.

The trip generation calculation presented in Table 4 is derived from a traffic study prepared for this Addendum (see **Appendix E**).[37] Calculation of the Project's trip generation on the local roadway network relies on data from the Prior EIR. The Project's proposed 570 new parking stalls are expected to result in 308 vehicle trips using the local street network to access the garage during the AM peak hour, and 245 vehicle trips using the local street network to access the garage during the PM peak hour. **Table 4** shows the expected new trips on the local roadway as a result in increased parking opportunities at the Project.

[37] TJKM Transportation Consultants, Traffic Impact Study Report, Dublin Transit Center Parking Garage, dated October 15, 2018, included as **Appendix E**

Table 4: Project Trip Generation							
		Daily		A.M. Peak Hour		P.M. Peak Hour	
Land Use	Parking Spaces	Rate	Trips	Rate	Total Trips	Rate	Total Trips
Parking Garage	570	3.47	1,874	0.54	308	0.43	245
Net New Trips			1,874		308		245

Source: TJKM, Traffic Impact Study Report, Dublin Transit Center Parking Garage, October 15, 2018, Appendix E

This calculation of the Project's trip characteristics is overly conservative for the following reasons:

- This calculation of Project trips does not account for the net reduction in trips resulting from replacing Campus/Office use on the D-1 Site with the Project. According to the Prior EIR, the D-1 Site was assumed to accommodate up to 170,000 square feet of office use, generating up to 1,115 daily trips, 212 AM peak hour trips and 200 PM peak hour trips.[38]At only one-half of the trips the Prior EIR analyzed for the D-1 Site (the Project only occupies ½ of the D-1 Site), the Project would generate 1,317 net new daily trips, or approximately 30% less trips than assumed in this Project analysis.
- This calculation does not rely on the same assumptions for BART-related parking as the Prior EIR used. The Prior EIR assumed the approximately 1,680 surface parking spaces that existed at the time would be replaced by a 1,680-space BART parking structure, and BART parking trips were assumed as existing vehicle trips re-distributed to a new location within the DTC (not new trips). Although BART did build a Phase 1 parking structure that contains 1,512 parking spaces, plans for a subsequent Phase II parking structure were not constructed. Under the reasoning of the Prior EIR, at a minimum 168 parking spaces within the Project (1,680 surface spaces that existed, minus 1,512 new spaces since constructed) could similarly be considered replacement parking and not counted as net new trips on the local roadway network.

External Intersection Impacts

Prior EIR Conclusions

The Prior EIR evaluated traffic impacts resulting from development of the DTC on 20 external local intersections, and concluded that the increased levels of peak hour traffic associated with the DTC would result in significant and unacceptable levels of service at the Dougherty Road/Dublin Boulevard (AM and PM) and Hacienda Drive/I-580 westbound off-ramp (AM) intersections. The DTC recommended the following mitigation measures to address those intersection impacts:

Mitigation Measure 4.11-1 (external intersection impacts): The following improvements shall be undertaken to reduce impacts to external intersections to a less-than-significant level:

[38]Applying the DTC EIR trip generation factor for Office use (6.56 daily trips/ksf, 1.25 AM peak hour trip/ksf, and 1.18 PM peak hour trip/ksf), to the 170,000 square foot office space assumed in the DTC EIR for Site D-1

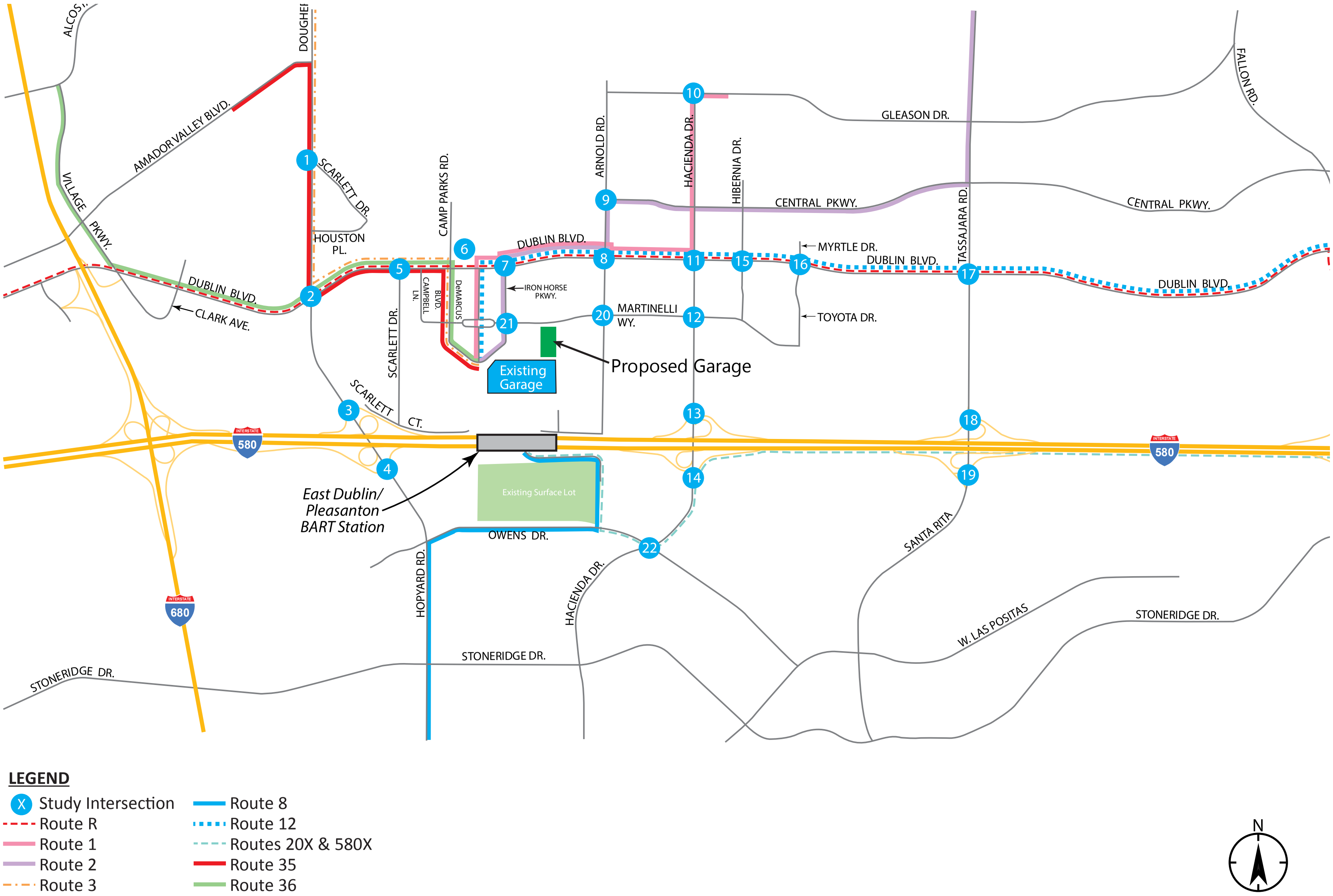

Figure 8
Traffic Study Intersection Locations

Source: TJKM 2018

a) Scarlett Drive Extension: The Scarlett Drive extension between Dougherty Road and Dublin Boulevard shall be constructed to relieve the Dougherty/Dublin intersection of south- and eastbound AM peak hour traffic, and west and northbound PM peak traffic.

b) Dougherty/Dublin intersection: The eastbound approach of Dublin Boulevard at this intersection shall be widened to include an additional through lane. The westbound left-turn lanes from Dublin Boulevard onto Dougherty Road shall be lengthened to accommodate additional traffic demand safely and efficiently. As part of these intersection improvements, Dougherty Road should be four (4) lanes in the southbound direction between Dublin Boulevard and the I-580 westbound on-ramp. These lanes should be configured so that the right most lane would lead exclusively to the I-580 westbound on-ramp, with the second right most lane leading to the overpass or the I-580 westbound on-ramp. These improvements would require widening and re-striping the I-580 westbound diagonal on-ramp.

With these improvements, intersection LOS at the Dougherty/Dublin intersection would improve from LOS E to LOS C during the AM peak hour and from LOS E to LOS D in the PM peak hour. However, under the Cumulative scenario, this intersection would operate at LOS E during the AM peak hour and LOS F during the PM peak hour. Additional improvements were not found to be feasible given the physical constraints at the Dougherty/Dublin intersection, and this impact was found to be significant and unavoidable.

- Hacienda/I-580 Westbound Off-Ramp: The northbound Hacienda Drive approach (overcrossing) shall be widened to three (3) northbound travel lanes. This improvement would require some alignment modifications to the I-580 westbound loop on-ramp. In addition, the I-580 westbound off-ramp approach would need to be widened to include three (3) left-turn lanes and two (2) right-turn lanes.

With these improvements, intersection LOS at the Hacienda/I-580 Westbound off-ramp would improve from LOS F to LOS D during the AM peak hour and from LOS B to LOS A in the PM peak hour.

c) Dougherty/Scarlett intersection: The southbound Dougherty Road approach shall be widened and re-striped to include two (2) left-turn lanes, two (2) through lanes, and one (1) free right-turn lane. The two left-turn lanes on this approach would be required based on projected AM peak hour traffic volumes. The northbound approach should be widened and re-striped to include one (1) left-turn lane, two (2) through lanes, and one (1) free right-turn lane. The westbound Scarlett Drive approach should have two (2) right-turn lanes and one (1) shared through/left-lane. The two right-turn lanes on this approach would be required based on projected PM peak hour traffic volumes.

With these improvements, intersection LOS at the Dougherty/Scarlett intersection is projected to be LOS B during the AM peak hour and LOS C during the PM peak hour.

d) Dublin/Scarlett intersection: The eastbound Dublin Boulevard approach shall be modified to include one (1) left-turn lane, three (3) through lanes, and one (1) right-turn lane. The westbound Dublin Boulevard approach should be widened to include one (1) left-turn lane, three (3) through lanes, and two (2) right-turn lanes. The two right-turn lanes on this approach would be required based on projected PM peak hour traffic volumes. The northbound Scarlett Drive approach would include one (1) left-turn lane and one (1) shared through/right-lane. The southbound Scarlett Drive approach would include two (2) left-turn lanes, one (1) through lane and one (1) right-turn lane. The two left-turn lanes on this approach would be required based on projected AM peak hour traffic volumes.

With these improvements, intersection at LOS at the Dublin/Scarlett intersection is projected to be LOS B during the AM peak hour and LOS A during the PM peak hour.

Project Analysis

Existing plus Project

Twenty-two intersections were analyzed in Traffic Study prepared for this Addendum (see **Figure 7**). The study intersections are located in the City of Dublin and the City of Pleasanton. Some of the intersection improvements recommended in the Prior EIR mitigation measures have been implemented by the City of Dublin, or are in progress. The status for each improvement (as provided below) was taken into consideration in this analysis:

- the Scarlett Drive extension is still being designed, and is not expected to be constructed for approximately three years
- the specified lanes at the Dougherty/Dublin intersection have been constructed and are operational
- The northbound improvements at the Hacienda/I-580 Westbound off-ramp have been made, but widening the off-ramp to five lanes has not been accomplished and there are no immediate plans for this improvement
- a portion of the improvements at the Dougherty/Scarlett intersection were included in the recently completed Dougherty Road improvement project
- the specified lanes at the Dublin/Scarlett intersection are not expected to be constructed until the Scarlet Drive Extension is constructed (in approximately 3 years)

Under an Existing plus Project scenario (including the three completed improvements identified above), all study intersections will operate at acceptable levels of service in accordance with thresholds set by Dublin and Pleasanton during both the morning and evening peak hours. The Project will have a less-than-significant impact at all study intersections.

Near-Term plus Project

The Near Term scenario includes additional traffic as estimated for other approved and pending developments, as well as traffic increases due to regional growth. This scenario reflects likely conditions in the next 10 years, similar to the Year 2035 analysis presented in the Prior EIR. Traffic forecasts for this scenario were developed using the City of Dublin Travel Demand Model.

Under the Near Term plus Project scenario, all studied intersections operate within acceptable standards of the cities of Dublin and Pleasanton during the AM and PM peak hours, except for the intersection of Dougherty Road/Dublin Boulevard. The Dougherty Road/Dublin Boulevard intersection is projected to operate at LOS E in the PM peak hour. Based on City of Dublin criteria, if the intersection is already operating at unacceptable operations (i.e., LOS E or LOS F) under without project conditions and the project adds 50 or more peak hour trips, than the project’s contribution is considered a significant impact. The Project will add less than 50 trips to this intersection, so the Project will not have significant impacts at the Dougherty Road/Dublin Boulevard intersection or any other study intersection under Near-Term plus Project conditions.

Vehicle Miles Traveled

Pursuant to Senate Bill 743, the Governor's Office of Planning and Research (OPR) released proposed changes to the state's CEQA Guidelines that will amend the way transportation impacts are analyzed. Specifically, SB 743 requires OPR to amend CEQA Guidelines to provide an alternative to Level of Service (LOS) for evaluating transportation impacts based on vehicle miles travelled (VMT). The amended CEQA Guidelines are still under review, and the City of Dublin and the County of Alameda have not yet determined how these guidelines will be implemented within their respective jurisdictions. Therefore, the following analysis is provided for informational purposes only, and is not considered a CEQA topic.

Prior EIR Conclusions

As a newly proposed threshold, VMT was not analyzed in the Prior EIR in year 2000.

Project Analysis

As a parking garage adjacent to the existing Dublin/Pleasanton BART station, the Project will be used to increase access to the regional public transit system. According to BART data, the average trip length for a BART passenger entering the East Dublin/Pleasanton BART station is approximately 29 miles.[39] Assuming that the Project is parked to 100% occupancy each day by BART patrons, and that each of these patrons will ride BART for an average trip of 24.5miles (one-way) rather than driving that same distance, the Project will remove 570 vehicles from the freeway. This will result in a reduction of approximately 13,965 one-way VMTs per weekday, or nearly 28,000 round-trip VMTs per weekday. On an annual basis (conservatively assuming the parking garage is not used on weekends), the Project will result in a reduction of nearly 7.262 million VMTs per year.

Freeway Operations

Prior EIR Conclusions

The Prior EIR concluded that in year 2025 without the DTC, I-580 mainline traffic conditions would exceed the Alameda County Congestion Management Agency's threshold of significance. The addition of DTC traffic would worsen this condition. This impact was found to be significant and unavoidable, and that mitigation was not feasible because freeway improvement were not within the jurisdiction of the City of Dublin.

Project Assessment

The Project is not considered a trip generating type of land use. Parking garages are assumed to accommodate the parking demands of other adjacent land uses that generate travel demands. As such, the Project does not increase traffic on the freeway, and would have no significant impact. Further, as indicated in the VMT analysis above, the Project will be used to increase access to the regional public transit system for BART passengers. The Project will remove approximately 570 weekday vehicles from

[39] BART station exit data for riders entering at the Dublin/Pleasanton station, as collected through the period of May 2018

those segments of the freeway between the East Dublin BART station and the BART rider's destinations, resulting in a reduction of approximately 7.3 million VMT per year, most of which would otherwise occur on the I-580 and I-680 freeways.

On-Site Circulation

Prior EIR Conclusions

THE Prior EIR found that all local roadway segments within the DTC would operate at satisfactory levels with the roadway improvements constructed as designed per the DTC analysis. However, the road segment of Hacienda Drive between Central Parkway and Gleason Drive was found to exceed average daily trip capacity of this road under cumulative traffic conditions in the future. The planned extension of Scarlett Drive between Dublin Boulevard and Dougherty Road was also found to approach maximum average daily traffic volumes under cumulative conditions.

To address this impact, the Prior EIR (Mitigation Measure 4.11-4) recommended that the road segment of Hacienda Drive between Central Parkway and Gleason Drive should be widened from three to four travel lanes, and the Scarlett Drive extension between Dublin Boulevard and Dougherty Road should be constructed with four travel lanes prior to buildout of the DTC. Since certification of the Prior EIR, Hacienda Drive has been widened to two lanes northbound and the southbound widening can be accomplished by narrowing the existing median, when (or if) the second southbound lane is needed. Construction of the planned Scarlett Drive extension has not been started, but current designs indicate this as a four-lane street.

Project Analysis

The Traffic Study prepared for this analysis concludes that, based on City of Dublin and adjacent communities' impact criteria, the Project is not expected to have any significant impacts at any of the study roadway segments under either Existing plus Project or Near-Term plus Project scenarios.

The Traffic Study prepared for this analysis (Appendix E) also includes a vehicle queuing and storage analyses for all exclusive left turn pockets at selected study intersections, and at driveways where Project traffic is added. Based on this analysis, the Project does not create a significant impact to on-site circulation. Left-turn queues at selected study intersections would not be significant under either Existing plus Project or Near-Term plus Project scenarios.

Parking

Prior EIR Conclusions

The Prior EIR concluded that, even though the DTC will increase the permanent supply of BART parking and will have potential to increase BART parking even further in the future, there was an identified demand for even more BART parking in the future. It was anticipated that the West Dublin BART station would reduce the demand for parking at the DTC, but it was considered likely that BART parking spaces at the DTC would continue to be at a premium. Unless properly managed, on-street parking spaces and nearby residential and office parking structures could be used by BART patrons, precluding parking for residents and visitors. To address this concern, the Prior EIR recommended (per Mitigation Measure 4.11-2) that all on street parking within the DTC be posted for short-term (2 or 4 hour) use, and that individual development projects design their parking lots and parking structures to discourage unauthorized BART patron use through security, validation or other means.

Since certification of the Prior EIR, all streets near the BART station have been posted for short-term parking and all private parking prohibits BART parkers.

Project Analysis

The Project is intended as a means to address existing unmet parking demand at the East Dublin/Pleasanton BART station (consistent with expectations of the Prior EIR). All existing parking spaces at the BART Phase 1 garage are typically occupied by approximately 7:30 AM. The purpose of the Project is to provide additional parking for BART patrons, improve access to the system, and minimize unauthorized on street BART parking. This is a beneficial effect of the Project, and not a significant CEQA impact.

Construction Related Traffic Impacts

Prior EIR Conclusions

The Prior EIR did not specifically address construction-related traffic impacts

Project Analysis

Construction of the Project is expected to occur over an estimated 12-month period. The balance of the D-1site immediately west of the Project is intended to be used as a staging area for construction equipment, supplies, materials, and possibly field offices. Construction activity will occur between the hours of 7 AM and 7 PM on weekdays. During peak construction periods, approximately 20 to 30 workers are expected to be on site. Each worker can be expected to average about three vehicular trips per day, including one trip during each of the commute periods, for a maximum of 90 daily trips.

Truck activity will occur during much of the construction period. Truck activity is estimated to be as follows:

Table 5: Estimated Truck Trips During Construction Period

Activity	Truck Loads	Total Truck Trips	Days of activity	Truck trips per day[1]
Off haul excavation	270	540	20	27
Concrete deliveries	862	1,724	120	18
Rebar deliveries	25	50	25	2
Subtotal	1,157	2 ,314		
Misc. +25%	290	580		
Total:	**1,447**	**2,894**		

Note 1: Total trucks/days of activity x 1.25

Source: TJKM

Trucks will likely arrive at the site using Martinelli Way, Arnold Road, Dublin Boulevard and either the Dougherty Road or Hacienda Drive interchanges at I-580. The Hacienda Drive interchange is preferred due to lower levels of congestion. The construction activity will not interfere with existing access to and from the BART Phase 1 garage immediately to the south. Overall, construction traffic will not increase traffic or congestion to levels described as resulting from operation of the Project. Therefore, construction traffic impacts would be similarly less-than-significant.

Conflict with Congestion Management Program

Project Analysis

Implementation of the Project will not result in deteriorated traffic operating conditions, and would have less-than-significant impacts on urban and suburban arterials. The Project does not conflict with any standards and/or policies established by the County of Alameda's Congestion Management Agency, and would result in a less-than significant impact based on the standards established by the Congestion Management Agency.

Change in Air Traffic Patterns

Project Analysis

The Project does not include any elements that would generate or impede air traffic patterns.

Hazards Due to a Design Feature

Project Analysis

Access to the Project would be from Campus Drive at the southeast corner of the garage structure. Campus Drive would be improved from Martinelli Way to Altimirano Road as part of the Project. The entrance requires a conventional 90-degree turn in from Campus Drive, consistent with City of Dublin's design standards and minimum sight distance standards. Based on the preliminary schematic design for the Project, there would be a less-than-significant impact relative to increased hazards due to site design.

Emergency Access

Project Analysis

Emergency access to the Project would be from the main entrance on Campus Drive and from the other two adjacent street frontages (i.e., Martinelli Way and Iron Horse Parkway). The main entrance will provide adequate access for emergency responders, and the adjacent street frontages will provide additional access for fire equipment. The Project will have a less-than-significant impact on emergency access.

Conflict with Adopted Plans Regarding Public Transit, Bicycle or Pedestrian Facilities

Project Analysis

The Project would provide additional off-street parking capacity to serve patrons of the East Dublin/Pleasanton BART station. Pedestrian and bicycle access to and around the Project site would utilize existing streets (and Campus Drive, to be constructed as part of the Project). The Project will not conflict with existing public transit, bicycle or pedestrian facilities, and will have a less-than-significant impact on alternative transportation.

Conclusions

This review of the Project demonstrates there are no changed circumstances that alter the conclusions of the Prior EIR regarding traffic or other transportation impacts. Changes to the roadway network and to traffic conditions in the area have changed since certification of the Prior EIR, but no significant changes in traffic conditions at or near the Project site have occurred that would invalidate the findings of the Prior EIR analysis or relevance to the Project.

The Project does introduce new information about parking opportunities at the DTC, but this new information does not result in new impacts or more severe impacts than previously disclosed in the Prior EIR. Traffic using local roadways and intersections to access the Project would not result in a significant traffic impact, and no mitigation measures are required of the Project to address traffic impacts. The Project will increase access to the regional public transit system for BART passengers and remove approximately 570 weekday vehicles from the freeway, resulting in a reduction of approximately 1.4 million VMT per year, most of which would otherwise occur on the I-580 and I-680 freeways. The Project will address existing unmet parking demand at the East Dublin/Pleasanton BART station, a demand that was anticipated pursuant to the Prior EIR. Although the Prior EIR did not fully address all current topics related to traffic and transportation as itemized in the 2018 CEQA Guidelines Environmental Checklist, the Project would not have new impacts related to these topics. The Project would not result in any new significant impacts not previously identified in the Prior EIR, nor would it substantially increase the significance of such impacts previously identified.

	New or More Severe Significant Impact	Not a New Impact, Requires Mitigation from DCT EIR	No Impact / Less than Significant
XVIII. Utilities and Service Systems			
Would the project:			
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☑
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☑
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☑
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☑
e)Result in a determination by the wastewater service provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the providers' existing commitments?	☐	☐	☑
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☑
g) Comply with federal, state and local statutes and regulations related to solid waste?	☐	☐	☑

Utilities and Service Systems

<u>Prior EIR Conclusions</u>

Water Supply

The Prior EIR concluded that the DTC would generate an estimated increased demand for water services of 447,000 gallons per day, but that extension of recycled water pipelines through the DTC and adherence to standard water conservation measures imposed by the City of Dublin would assist in reducing this total water demand. It also found that the Dublin San Ramon Services District (DSRSD) and Zone 7 water agreements are in place to serve the DTC full buildout, and increased water demands would be less-than-significant.

Wastewater

THE Prior EIR found the DTC would generate an estimated 447,000 gallons per day of additional wastewater flows, but that DSRSD had anticipated this approximate level of development, and existing and planned wastewater collection and treatment facilities could accommodate DTC buildout. Impacts to the wastewater collection and treatment system were found to be less-than-significant. Similarly, the Prior EIR found that the completion of planned wastewater disposal facilities from the DSRSD wastewater treatment plant to the East Bay Discharger's Authority outfall pipe to San Francisco Bay would be adequate to accommodate increased wastewater flows from the DTC, and impacts would be less-than-significant.

Solid Waste Disposal

The Prior EIR found that the DTC would increase the amount of solid waste entering the waste stream, but that additional quantities of solid waste, including construction debris, could be accommodated at the nearest landfill. Additional capital equipment and personnel would be funded from user fees and charges, and the impact would be less-than-significant.

Electrical Power

The Prior EIR found the DTC would require additional power supplies, and until State and local power supply and transmission issues were resolved, it was uncertain whether PG&E could provide a reliable supply of electrical power. Although the DTC included on site electric power generation, it was not certain that this on-site source would generate sufficient power to serve the entire DTC without supplemental or back-up power from PG&E. The County of Alameda, through its Public Works Agency, will obtain permits and power from PG&E.

<u>Project Analysis</u>

The Project would have only minimal demands on water and wastewater utilities for use in restrooms or other sanitary facilities (as may be included). No new water or wastewater treatment facilities or expansion of existing facilities would be required for the Project. The Project would generate minimal solid waste from patrons of the proposed garage and on-site management staff. The Project would utilize energy efficient lighting, and other energy use would be negligible as there would be no heating or cooling of the open-air parking structure. The Project is also expected to be designed for and equipped with communication services for use by on-site management staff. These would include telephone, CATV, and internet/ WiFi services. The Project's impacts on utilities and public service systems would be less-than-significant.

Conclusions

This review of the Project demonstrates there are no changed circumstances that significantly alter the conclusions of the Prior EIR regarding utilities and service systems. No significant changes in expected utility demands at or near the Project site have since occurred that would invalidate the findings of the Prior EIR analysis or relevance to the Project. There is no new information about the Project that would indicate a new or more severe impact on utilities or service systems than disclosed in the Prior EIR. Nothing about the Project as a parking garage would result in a new or more significant effect on utilities than if the site were developed as an office or hotel use as analyzed in the Prior EIR. The Project's individual effects on utilities will be less-than-significant, and the Project would not generate any new impacts related to these topics.

	New or More Severe Significant Impact	Not a New Impact, Requires Mitigation from DCT EIR	No Impact / Less than Significant
XVII. Mandatory Findings of Significance			
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☑	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable?("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☑	☐
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☑	☐

Quality of the Environment

The Project site is an undeveloped and graded site surrounded on three sides by urban development. Although the site does not contain high habitat value for fish or wildlife species, this Checklist indicates that there is a potential for the Project to degrade the environment under resource issues of biology, hydrology and water quality. All such potential impacts will be mitigated to a less-than-significant level through implementation of mitigation measures as derived from the Prior EIR. With implementation of all mitigation measures, implementation of the Project would not threaten to eliminate a plant or animal, nor reduce the number nor restrict the range of a rare or endangered plant or animal species. Implementation of the Project as proposed would not require demolition of buildings that have been formally identified as “historic resources” as defined in CEQA Guidelines Section 15064.5.

Cumulative Effects

The Project has been analyzed within the context of the 2002 Prior EIR. That Prior EIR was a Program EIR prepared pursuant to Section 15168(a) of the CEQA Guidelines that evaluated cumulative environmental impacts associated with the entire 91-acre DTC area, including a Specific Plan/General Plan Amendment, a Stage 1 Planned Development Rezoning, Parcel Maps and a Development Agreement. When certified, that Prior EIR envisioned that the Program EIR would be used as a basis for subsequent environmental documentation of individual projects, providing the cumulative analysis for those projects (including the Project as analyzed in this Addendum). No further cumulative analysis is required. Implementation of mitigation measures as identified in the Prior EIR will address all potentially significant cumulative impacts from development of the DTC, including the Project.

Adverse Effects on Human Beings

Potentially significant impacts that could adversely affect human beings potentially include impacts to air and water quality, geologic risks and exposure to toxic air contaminants and hazardous materials. With implementation of mitigation measures identified in this Addendum, all such potential adverse effects on human beings would be reduced to levels of less-than-significant.

Mitigation Measures Included In This Addendum

The following mitigation measures from the Prior EIR (as amended to reflect current regulations and/or lead agency status) are required of the Project to reduce environmental effects identified in this Addendum:

Mitigation Measure 4.1-1: Include breaks and corridors between building clusters, especially along the north-south axis, so that some views of Mount Diablo are maintained, taking into account the need to block freeway noise and to create a compact transit-oriented development pattern.

Prior EIR Mitigation Measure 4.1-2 (as amended): As part of its design/build contract, the County of Alameda GSA shall require submittal of lighting plans for the Project. This lighting plan shall ensure that all exterior lighting fixtures will either be oriented downward or equipped with cut-off lenses to ensure that no spillover of unwanted light onto adjacent residential areas shall occur.

Prior EIR Mitigation Measure 4.2-1 (as amended): The following construction-period BMPS are required for all construction projects pursuant to the Project:

a) All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.

b) All haul trucks transporting soil, sand, or other loose material off-site shall be covered.

c) All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.

d) All vehicle speeds on unpaved roads shall be limited to 15 mph.

e) All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.

f) Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

g) All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

h) Post a publicly visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

Prior EIR Mitigation Measure 4.3-1 (Congdon's spikeweed): The following mitigation measures would mitigate the loss of a population of Congdon's tarplant (also known as spikeweed):

a) The size of any portion of the Project area occupied by the tarplant should be determined from field surveys and notes on past on-site distribution, measuring the entire area from which the plant has been observed. If the plant is present and on-site avoidance is not possible, one of the following options must be taken to ensure replacement on a 1:1 acreage ratio:

b) Option "A": Permanently preserve, through use of a conservation easement or other similar method, equal amount of off-site acreage that contains the plant; or

c) Option "B": Harvest seeds from on-site plants to be lost or from another source within the Livermore-Amador Valley, and seed an equal amount of off-site area suitable for supporting the plant, which shall be preserved and protected in perpetuity.

d) The Project sponsor shall demonstrate how the developer will comply with this mitigation measure, including the steps they will take to ensure that reseeding will be successful. If Option" B" is selected and is not successful, Option "A" shall be implemented.

Mitigation Measure 4.3-3 (burrowing owl): The following measures will reduce potential impacts to burrowing owls to a less-than-significant level.

a) Pre-construction surveys by a qualified biologist shall be conducted on the entire Project area and within 150 meters (500 feet) of the Project area within 30 days prior to any ground disturbance. If ground disturbance is delayed or suspended for more than 30 days after the pre-construction survey, the site shall be resurveyed.

b) If over-wintering birds are present (September 1 to January 31) no disturbance should occur within 160 feet of occupied burrows unless the Department of Fish and Game provides a letter giving consent to relocate wintering birds. If owls must be moved away from the disturbance area, passive relocation techniques, following CDFG 1995 guidelines, should be used rather than trapping. If no overwintering birds are observed, burrows may be removed prior to the nesting season to reduce impacts from noise, dust, and human disturbance to mated pairs.

c) If removal of unoccupied potential nesting burrows prior to the nesting season is infeasible and construction must occur within the breeding season, maintain a minimum buffer (at least 250 feet) around active burrowing owl nesting sites identified by preconstruction surveys during the breeding season to avoid direct loss of individuals (February 1 - September 1). All active burrows shall be identified.

d) If construction is scheduled during summer, when young are not yet fledged, a 250-foot exclusion zone around the nest shall be established or construction shall be delayed until after the young have fledged, typically by August 31.

e) When removal of occupied burrows is unavoidable, existing unsuitable burrows should be enhanced (enlarged or cleared of debris) or new burrows created (by installing artificial burrows) at a 2:1 ratio on protected lands, as provided for below.

f) A minimum of 6.5 acres of foraging habitat per pair or unpaired resident bird shall be acquired and permanently protected. The protected lands shall be adjacent to occupied burrowing owl habitat and at a location acceptable to CDFG.

g) The project sponsor shall prepare a management plan and provide funding for long-term management and monitoring of the protected lands. The monitoring plan should include success criteria, remedial measures, and an annual report to CDFG.

Mitigation Measure 4.4-1 (historical, archeological and Native American resources): If, during construction of individual development projects within the Transit Center, archeological, discrete historical or Native American artifacts are encountered, work on the project shall cease until compliance with CEQA Guidelines Section 15064.5 is demonstrated. Project work may be resumed in compliance with any applicable resource protection plan. If human remains are encountered, the County Coroner shall be contacted immediately.

Mitigation Measure 4.5-1: Site-specific geotechnical investigations shall be required for the Project. Design and construction of structures shall be in accordance with the seismic design requirements of the latest edition of the Uniform Building Code (UBC), which includes construction standards near fault factors. The site-specific geotechnical investigation should further investigate the presence of potentially liquefiable material at the site. Conventional design engineering techniques should be able to mitigate for minor settlements.

Mitigation Measure 4.5-2: The required site-specific geotechnical investigation shall address expansive soils, and provide appropriate engineering and construction techniques to reduce potential damage to buildings and pavement surfaces.

Mitigation Measure 4.6-1 (as amended): Pursuant to the Phase I environmental investigations performed for the Project site, the Project sponsor shall be responsible for performing any necessary cleanup, as recommended in the environmental investigations and as required by regulatory authorities.

Mitigation Measures 4.7-1 through 4.7-3 (as amended): The Project sponsor shall obtain all necessary permits and comply withal applicable regulations of the NPDES General Construction Permit for stormwater discharges associated with construction and land disturbance activities. Under these regulations, a Stormwater Pollution Prevention Plan (SWPPP) shall be prepared that incorporates Best Management Practices (BMPs) for construction activities to prevent stormwater pollutants generated during construction of the Project to enter stormwater flows, as well as an Erosion Control Plan. The Project sponsor shall also demonstrate compliance with all applicable stormwater control regulations detailed under the NPDES MRP permit for operational stormwater quality control.

Mitigation Measure 4.7-3: The Project sponsor shall prepare an erosion and sedimentation control plan for implementation throughout project construction. The plan should be prepared in accordance with the County of Alameda and RWQCB design standards. It is recommended that this plan, at a minimum, include the following provisions:

a) Existing vegetated areas should be left undisturbed until construction of improvements on each portion of the development site is actually ready to commence;

b) All disturbed areas should be immediately revegetated or otherwise protected from both wind and water erosion upon the completion of grading activities;

c) Stormwater runoff should be collected into stable drainage channels, from small drainage basins, to prevent the buildup of large, potentially erosive stormwater flows;

d) Specific measures to control erosion from stockpiled earth and exposed soil;

e) Runoff should be directed away from all areas disturbed by construction;

f) Sediment ponds or siltation basins should be used to trap eroded soils before runoff is discharged into on-site or offsite drainage culverts and channels.

g) To the extent possible, project sponsors should schedule major site development work involving excavation and earth moving for construction during the dry season.

Mitigation Measure 4.9-1 (as amended): As part of its design/build contract, Alameda GSA shall require preparation of a Noise Management Plan that identifies measures to be taken to minimize construction noise on surrounding developed properties, particularly residential developments. This Plan shall contain, at a minimum, a listing of hours of construction operations, use of mufflers on construction equipment, limitation on on-site speed limits, identification of haul routes to minimize travel through residential areas and identification of a noise monitor. Specific noise management measures shall be included in appropriate contractor specifications.

In addition to those applicable mitigation measures of the Prior EIR, the County of Alameda shall require the following as part of their design/build contract and/or operation plans:

- Consistent with Project commitments, the County of Alameda shall require an Emission-Reduction Program as part of their design/build contract. That program shall require retrofitting of older diesel engines with Level 3 diesel particulate filters, or use of Tier 4 diesel engines that already incorporate Best Available Control Technologies, or equivalent.
- If necessary to comply with emergency response standards of the ACFD, the Project may incorporate caches of fire-fighting equipment on upper floors of the garage and other Project-specific measures as may be identified by the Alameda County Fire Marshal, consistent with Prior EIR Mitigation Measure 4.12-2
- The Project sponsor shall prepare a Safety and Security plan to assure compliance with applicable standards and coordination with Dublin Police, generally consistent with Prior EIR Mitigation Measure 4.12-2.

Appendix A:

Livermore Amador Valley Transportation Authority, TIRCP Funding Application

Wheels

Livermore Amador Valley Transit Authority

January 10, 2018

Ezequiel Castro, Acting Chief Division of Rail and Mass Transportation
Office of State Transit Programs and Plans (MS 39)
P.O. Box 942874
Sacramento, CA 94274-001

Dear Mr. Castro,

The Livermore Amador Valley Transit Authority (LAVTA) in partnership with co-applicant Alameda County General Services Agency is pleased to submit this grant application of highest priority for the funding of a multi-level parking structure that will accommodate more than 500 transit riders daily and will include electric vehicle charging stations and preferred parking for vanpools to further maximize utilization. This much needed structure is located in a highly congested area and a critical transit center that includes BART, LAVTA, County Connection, MAX, San Joaquin RTD, and Stanislaus Regional Transit. This structure will facilitate commuters, a significant portion of which come to this transit center from disadvantaged communities, that are seeking to utilize these transit options, but are often denied due to a lack of parking capacity as early as 7:30am at the BART station.

The parking structure will be constructed on a 2.46-acre parcel of Alameda County owned land adjacent to the BART station. The envisioned $34 million, multi-level convertible parking structure is forward-thinking and sustainable, utilizing innovative technologies to reduce GHG emissions and encouraging the use of electric vehicles and vanpools by providing preferred parking that does not currently exist.

As the lead applicant on the proposed project, LAVTA encourages the approval of this application for the construction of the parking structure. Possessing signature authority for this grant application, I submit to the accuracy of its preparation, and to the expeditious completion of the project when the funding is approved.

Sincerely,

Michael S. Tree
Executive Director

1362 Rutan Court, Suite 100 • Livermore, CA 94551
(925) 455-7555 • (925) 443-1375 fax
www.wheelsbus.com

2018 Transit & Intercity Rail Capital Program Project Proposal
Submitted By:
Livermore Amador Valley Transit Authority (LAVTA) in partnership with
Alameda County General Services Agency (GSA)

DUBLIN/PLEASANTON CAPACITY IMPROVEMENT & CONGESTION REDUCTION PROGRAM
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A. Project Title Page

ii. Lead Applicant: Livermore Amador Valley Transit Authority (LAVTA)
Co-Applicant: Alameda County General Services Agency (GSA)

iii. Project Priority: This project is the highest priority in the region. Lead agency is not submitting multiple applications to the TIRCP.

iv. Project Purpose and Need: The Livermore Amador Valley Transit Authority is requesting funding from the 2018 Transit and Intercity Rail Capital Program (TIRCP) to support the Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program, a critical infrastructure development program that will significantly reduce congestion in a high-traffic area, further integrate multiple local and regional transit lines, increase ridership to a number of Bay Area and regional transit agencies, and further reduce Greenhouse Gas (GHG) emissions throughout the area. In partnership, LAVTA and GSA will develop a multi-level parking structure that will accommodate nearly 500 transit riders daily and will include electric vehicle charging stations and preferred parking to vanpools to further maximize utilization. The structure location is a highly congested area and a critical transit center that includes Bay Area Rapid Transit (BART), County Connection, MAX BART Express, San Joaquin RTD, Stanislaus Regional Transit and LAVTA. This structure will facilitate commuters, a significant portion of which come to this transit center from disadvantaged communities, that are seeking to utilize these transit options, but are often denied due to a lack of parking capacity as early as 7:30am at the BART station. BART data reports that in 2015, 60% of riders that originate at the Dublin/Pleasanton station drive and park at the BART station.[1] As the area has only gotten more congested since that time, the need for increased parking capacity is critical. The project is a future-thinking project by design and will incorporate new and still-developing technology to reduce GHG emissions.

v. Project Location: The proposed parking structure will be located in the City of Dublin on a 2.46-acre parcel of Alameda County-owned land, adjacent to the Dublin-Pleasanton BART station. The Dublin/Pleasanton station is unique in that it straddles the border of Dublin and Pleasanton on Interstate 580 and as noted above, features a number of local and regional bus connections. The Dublin/Pleasanton transit center provides access to public rapid transit to hundreds of thousands of riders throughout Alameda County, a region that includes cities with the highest poverty levels in the state. In the city of Oakland, one of Alameda County's most populated cities, more than 20% of people live at or below the Federal Poverty Line.[2] The increased access to transit options and environmental benefits will directly impact disadvantaged communities throughout Alameda County.

vi. Project Mode: The project is multi-modal. The proposed structure will serve the following modes: Local Bus, Bus Rapid Transit, Commuter Rail, Feeder Bus, and Vanpool.

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[1] BART 2015 Station Profile Survey Preliminary Results. https://www.bart.gov/sites/default/files/docs/BART%202016%20Wksp%204.D%202015%20Station%20Profile.pdf
[2] United States Census Bureau. Quick Facts: Oakland city, California, 2015. https://www.census.gov/quickfacts/fact/table/oaklandcitycalifornia/PST045216

2018 Transit & Intercity Rail Capital Program Project Proposal
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vii. Multi-Agency Coordination – LAVTA, as the lead applicant transit agency for this proposal, is partnering with the Alameda County GSA to access funding to increase their parking capacity in an effort to increase access to public transit options, increase LAVTA ridership, and reduce congestion in this high-traffic area. Through this partnership, LAVTA will sub-contract with the Alameda County GSA who will be the constructing agency. Due to the construction occurring on Alameda County-owned land and GSA's extensive experience in construction, GSA will plan and manage the construction of the project, and operate, maintain and own the completed structure.

viii. Green House Gas (GHG) Reductions – The proposed project is forward-thinking by design and will incorporate new, and still-developing, technologies to reduce GHG emissions. From a design perspective, the structure will be designed with sustainability as a top priority. The proposed design will construct a "convertible garage" that can function as a parking garage while necessary but once the need for parking reduces, can be converted to housing or workspace with greater ease. This design recognizes the projected reduction in individual car ownership over the next decade and will encourage long-term reductions in GHG emissions as the population utilizing the rapid transit in this region becomes less dependent on individual vehicles. In the short term, improved air quality will be seen as a result of increased ridership on all intersecting transit agencies – LAVTA, BART, etc. – and dedicated space for electric vehicle charging and vanpool parking that seeks to encourage ridership on the above listed transit services. Quantifiable GHG Emission Reductions ($MTCO_2e$) equal 59 based on the attached TIRCP Calculator. There are also significant co-benefits of the project based on the calculations, particularly for those individuals living in disadvantaged communities. See attached calculator for further detail.

ix. Funding

- **Transit and Intercity Rail Capital Program Funding Requested:** $20,000,000
- **Non-Transit and Intercity Rail Capital Program Matching Funds from Metropolitan Transportation Commission (MTC) and Alameda County Transportation Commission (ACTC) Funds:** $14,000,000

x. Point of Contact for Application

Michael Tree, Executive Director
Livermore Amador Valley Transit Authority
(925) 455-7564
mtree@lavta.org
2500 Railroad Avenue
Livermore, CA 94551

2018 Transit & Intercity Rail Capital Program Project Proposal
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B. Project Costs

i. **The total project cost of the proposed parking structure is $34,000,000.** Funding from TIRCP will fulfill $20,000,000 of the total and the remaining, non-TIRCP funding of $14,000,000 will be derived from two sources – Metropolitan Transportation Commission (MTC) funding ($7,000,000) and Alameda County Transportation Commission (ACTC) funding ($7,000,000).

ii. These cost estimates have been approved by the Executive Director of LAVTA and the Director of Alameda County's GSA as denoted by their signed letters of support for this application.

iii. **Funding Commitment - $14,000,000** – Alameda County GSA has committed to funding the initial operating costs, maintenance and ongoing operating costs of the completed structure. The non-TIRCP matching funds of $14,000,000 are committed through the completion of the garage which is projected for December 2019 based on the attached Project Schedule and Project Programming Request Form (Attachment 3 &4).

iv. **Amount of TIRCP Funds Requested: $20,000,000**
No TIRCP Funding will be used to supplant other committed funds.

C. Eligibility

The lead applicant on this proposed project is the Livermore Amador Valley Transit Authority (LAVTA). The Authority was established in 1985, under a Joint Powers Agreement to provide public transit in the cities of Dublin, Livermore, Pleasanton, and in unincorporated areas of Alameda County. LAVTA is governed by a seven-member Board of Directors. The Authority has planning responsibility for the following named transportation services:

- Wheels – Daily Fixed Bus Route Service
- Tri-Valley Rapid – Daily Bus Rapid Transit Service
- Dial-a-Ride – Paratransit service

Wheels and Tri-Valley Rapid services are operated and maintained through a contract with MV Transportation. Dial-A-Ride service is operated and maintained through a contract with MTM Transportation. The mission of LAVTA is to provide equal access to a variety of safe, affordable and reliable public transportation choices, increasing the mobility and improving the quality of life of those who live or work in and visit the Tri-Valley area. These include bus connections to BART, Altamont Commuter Express, and Central Contra Costa County Transportation Authority (County Connection).

For the purposes of the proposed project, LAVTA has chosen to partner with the Alameda County General Services Agency, a public agency responsible for delivering a host of services including building maintenance, property acquisition, architectural, engineering, construction, contract and procurement, transportation and child care services for Alameda County. The GSA Community not only provides these services, but facilitates collaborative and innovative approaches in their efforts. While GSA largely focuses on support services for Alameda County departments and other public agencies, the work has a direct impact on local communities throughout the county. GSA builds structures that transform communities and provide opportunities to engage local businesses while working towards ensuring that County work practices minimize negative impacts on the environment.

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D. Project Benefits

Brief Summary. The County of Alameda has the need for a parking structure on a 2.46-acre parcel of Alameda-County owned land, adjacent to the Dublin/Pleasanton BART station. The envisioned $34 million, multi-level convertible parking structure will accommodate 537 spaces at maximum, adding much-needed parking in this critical transit center that facilitates commuters seeking to utilize transit to the six regional transit lines that are accessible from the site, the collective daily ridership of which is in the tens of thousands. Due to the significant traffic and parking congestion in the area, many prospective transit utilizers are denied on a daily basis due to the lack of parking as early as 7:30am at the BART station. The design and implementation of this garage is forward-thinking and sustainable, utilizing innovative technologies to reduce GHG emissions and encouraging the use of electric vehicles and vanpools by providing preferred parking that does not currently exist. The proposed project will directly impact disadvantaged communities by providing increased access to rapid transit options through stronger integration between local bus lines, vanpool options and BART and further improving air quality throughout the Bay Area by reducing road congestion in these densely populated areas.

Detailed Description. As noted above, the County of Alameda has a demonstrated need for a multi-level parking structure on a 2.46-acre parcel of Alameda County-owned land, adjacent to the Dublin/Pleasanton BART station. In order to achieve the desired outcomes of this project – increasing the ridership capacity of all regional transit lines and reducing congestion in this densely populated area – LAVTA has partnered with the Alameda County General Services Agency (GSA) to construct a $34 million multi-level, convertible parking structure that will provide 537 additional parking spaces in this critical transit center. LAVTA is the lead transit agency for the proposed project in support of its mission – to provide equal access to a variety of safe, affordable and reliable public transportation choices, increasing the mobility and improving the quality of life of those who live or work in and visit the Tri-Valley area. LAVTA will subcontract with GSA, who will plan and manage the construction of the project, and operate, maintain, and own the completed garage for the duration of its use. As use of the structure is no longer needed, the garage will be converted to a functional space that serves the need of the community at that time.

Regional Overview. The Tri-Valley Area is located 39 miles east of San Francisco and 28 miles north of Silicon Valley. See Map 1 below for a depiction of the Tri-Valley area. This area is a crossroads for commuter travelling from the Central Valley to Silicon Valley and other employment destinations. With a combined population of over 200,000 residents, the Dublin-Livermore-Pleasanton area is one of the fastest growing in the Bay Area. It is also one of the most traffic congested. According to MTC's 2015 Vital Signs Report, "across all modes, the average Bay Area commute takes longer than ever before and now lasts over 31 minutes door-to-door. Increasing congestion and longer-distance commutes to job centers in San Francisco and Silicon Valley have contributed to this trend. Importantly, modal choice affects commute duration. Commuters choosing to drive alone spend 28 minutes getting to work, while those choosing public transit log an average commute time nearly twice as long at 51 minutes." Additionally, the report states that "in 2015 commute times for solo drivers in Contra Costa County (part of LAVTA's service area) increased more than anywhere else in the Bay Area…These cities are impacted by a regional jobs-housing imbalance where they act as bedroom communities for distant job centers." The reported commute times in Alameda County for 2015 were 32.9 minutes overall and 51.7 minutes for those commuters depending on transit.

Map 1. Depiction of Tri-Valley Area

MTC reports that over 600,000 vehicles enter and exit the Bay Area. Over half of these travelers use just two regional gateways: Interstate 80, Interstate 580 and 205. The congestion at each of these gateways has climbed 43% since 1992.[3] The regional negative impacts of this level of traffic congestion environmentally, financially, and socioeconomically is significant.

Local System Overview. LAVTA has planning responsibility for the following named transportation services:

- Wheels – Daily Fixed Bus Route Service
- Tri-Valley Rapid – Daily Bus Rapid Transit Service
- Dial-a-Ride – Paratransit service

Wheels and Tri-Valley Rapid services are operated and maintained through a contract with MV Transportation. Dial-A-Ride service is operated and maintained through a contract with MTM Transportation. According to the Metropolitan Transportation Commission's Statistical Summary of Bay Area Transit, in 2015, LAVTA's service area is 40 square miles and it serves a population of 198,893 which includes the cities of Livermore, Pleasanton, Dublin, and the unincorporated areas of eastern Alameda County, with commuter service to Contra Costa County. LAVTA runs 16 Fixed Bus routes and 15 School Tripper routes utilizing an active fleet of 71 motor buses and 18 paratransit vehicles. Average daily ridership in FY2015 was reported at 5,737 and annual fixed route ridership for the same time period was reported at 1,652,151.[4] Wheels also connects with six other public transportation systems including the Central Contra Costa Transit Authority, Amtrak, The Modesto Area Express (MAX), SolTrans, the San Joaquin Regional Transit District (RTD), and West Contra Costa

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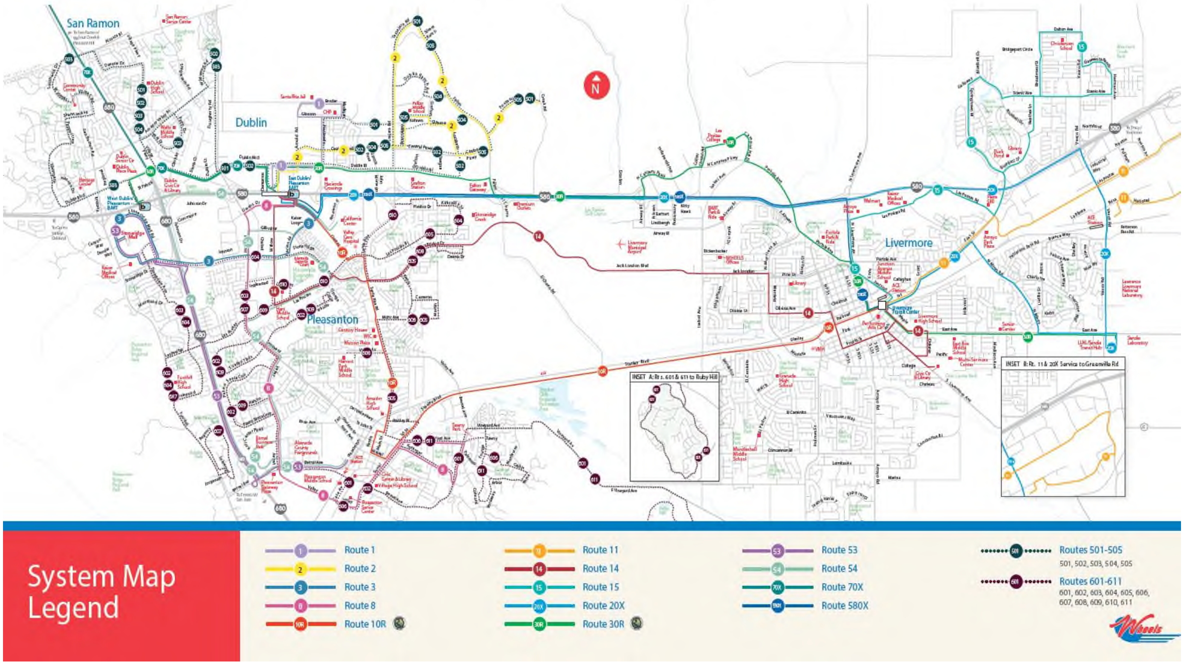
[3] MTC Vital Signs Report, 2015. Metropolitan Transportation Commission. http://www.vitalsigns.mtc.ca.gov/commute-time

[4] MTC Statistical Summary of Bay Area Transit Operators, 2015. Metropolitan Transportation Commission. https://mtc.ca.gov/sites/default/files/Statistical_Summary_2015.pdf

Transit Authority (WestCAT). See Map 2 for a depiction of the fixed bus route service LAVTA provides.

Map 2. Wheels (LAVTA) Fixed Bus Route Service Map



There are six regional transit lines that intersect in the proposed location of the parking structure, a County-owned parcel named "D-1." They include: BART, County Connection, MAX BART Express, San Joaquin RTD, Stanislaus Regional Transit, and Wheels (LAVTA). Most critically, the Dublin/Pleasanton BART Station is the end of the Dublin/Pleasanton line that originates at the Dublin Pleasanton Station and runs to Daly City and connects to the Pittsburg/Bay Point Line which runs all the way to the San Francisco International Airport (SFO). See Map 3 for a depiction of current BART service. The Dublin/Pleasanton station is located closest to the proposed structure is fed by twenty local and regional bus lines from five different providers that reach as far as Patterson and Turlock – serving clients up to 70 miles away. BART estimates ridership in FY16 averages 430,000 trips on weekdays and 129 million trips annually. During peak commute hours, over 60,000 people ride through the Transbay Tube in each direction.[5]

[5] BART 2016 Fact Sheet. Bay Area Rapid Transit, 2016. https://www.bart.gov/sites/default/files/docs/2016Factsheet_v12.pdf

Map 3. BART Station List

Current Situation. Vehicle parking at the Dublin/Pleasanton BART station is located on both sides of the I-580 freeway and currently accommodates 3,039 vehicles. This includes 427 spaces available from a temporary lease from the Alameda County Surplus Property Authority (ACSPA). Although the Dublin/Pleasanton Station provides the second largest number of parking spaces in the BART system, the parking lot fills during each morning commute, many times by 7:30am causing significant frustration for riders, increased traffic congestion on core freeways during peak commute times, and further environmental damage from increased fuel consumption. Additionally, the lack of parking capacity has particular negative impacts on low-income individuals as it limits overall access to this originating BART line which promotes further traffic congestion on critical freeway corridors throughout the Bay Area, many of which run through highly impacted, low-income communities (i.e., I-80, I-880, and I-680 corridors).

E. **Project Impacts**

Proposed Solution & Project Impacts. LAVTA, in partnership with Alameda County GSA, is proposing to construct a multi-level convertible parking garage that will provide a maximum of 537 additional parking spaces on a 2.46-acre parcel of County-owned land. The estimated useful life of the garage is at minimum 40 years (2060). As the need for individual car parking diminishes, the parking garage can be easily converted to housing or workable space. The proposed users of this garage are the thousands of daily and occasional LAVTA and BART riders, many of which are traveling from disadvantaged communities to work or school, that are unable to effectively access local and regional rapid transit options due to a lack of parking capacity. The proposed project addresses all statutory funding guidelines of the California Air Resources Board which include:

1. Reduce GHG emissions – By improving access to local bus and rapid transit in the highly congested Tri-Valley area, we will increase ridership to LAVTA, BART and the other feeder transit agencies. In doing so, we will achieve the following reductions that contribute to the reduction in GHG emissions:

a. Reduce fuel consumption for individually-owned vehicles; and
b. Reduce the number of individually-owned vehicles on already congested freeways in the Bay Area; and
c. Encourage the use of local bus, vanpool, and electric vehicle services to access LAVTA and BART services which will further reduce congestion and GHG emissions from vehicles during peak commute hours.

Proposed Metric: Displaced Autos Inputs
Collection Method: Annual Ridership – LAVTA and BART, Average Length of Trip (MTC), Rider Survey

2. Maximize economic, environmental, and public health benefits to the region and State – research indicates that reductions in traffic congestion result in a number of economic, environmental and public health benefits. Economic benefits include increased access to local, Tri-Valley businesses through LAVTA or other local transit lines. Environmental benefits include a reduction in GHG emissions, a reduction of fuel consumption, and encouraged use of alternate transportation options. Public health benefits include a reduction in road rage incidents as a result of driver frustration and reductions in individual commute times from increased access to public transit during peak commute times.
   Proposed Metric: Increased LAVTA Ridership on Existing Routes
   Collection Method: Ridership by Route
3. Maximize benefits to disadvantaged communities – LAVTA and BART provide service to Alameda County and the Tri-Valley area, each of which have a number of census tracts that have been identified by CalEPA as disadvantaged communities. As noted a significant percentage of riders come from as far as 70 miles down the I-580 and 205 corridors to access the Dublin Pleasanton station. The location of the proposed structure was selected specifically because it would increase parking capacity so that more individuals from these communities could effectively access local and rapid transit services. Additionally, disadvantaged communities like those on the I-880 and 80 corridors will residually benefit from the reduction in traffic congestion and the reduced GHG emissions. The proposed project location, D-1 serves a number of census tracts that have been identified as containing a significant percentage of disadvantaged communities and/or low-income households. These Census tracts include but are not limited to: 6077005206 (disadvantaged), 6077005202 (disadvantaged), 6077003900 (low-income community), 6001409000 (low-income), 6099003300 (low-income).
   Proposed Metric: Change in number of Riders from CalEPA-identified “disadvantaged communities”
   Collection Method: Rider Survey of Originating City and Transit Method

The Dublin/Pleasanton Congestion Reduction Program also addresses the following required, Primary Evaluation Criteria:

1. **Reduce greenhouse gas (GHG) emissions.**
   The quantified greenhouse gas reductions are detailed in the attached California Air Resources Board (CARB) Calculator Tool. The General Approach to Emissions for the proposed project is based on the CARB Quantification Methodology provided for “Systems and Efficiency Improvements that Result in Increased Ridership” – Emission Estimates = Emissions of Displaced Autos. Based on the attached calculations, the Capacity Improvement and Reduction

Program is achieving 59 total GHG emission reductions based on the attached completed calculator (see attachment). The total GHG emission reduction/total GGRF Funds requested is .000003 equaling \$337,095/$MTCO_2e$.

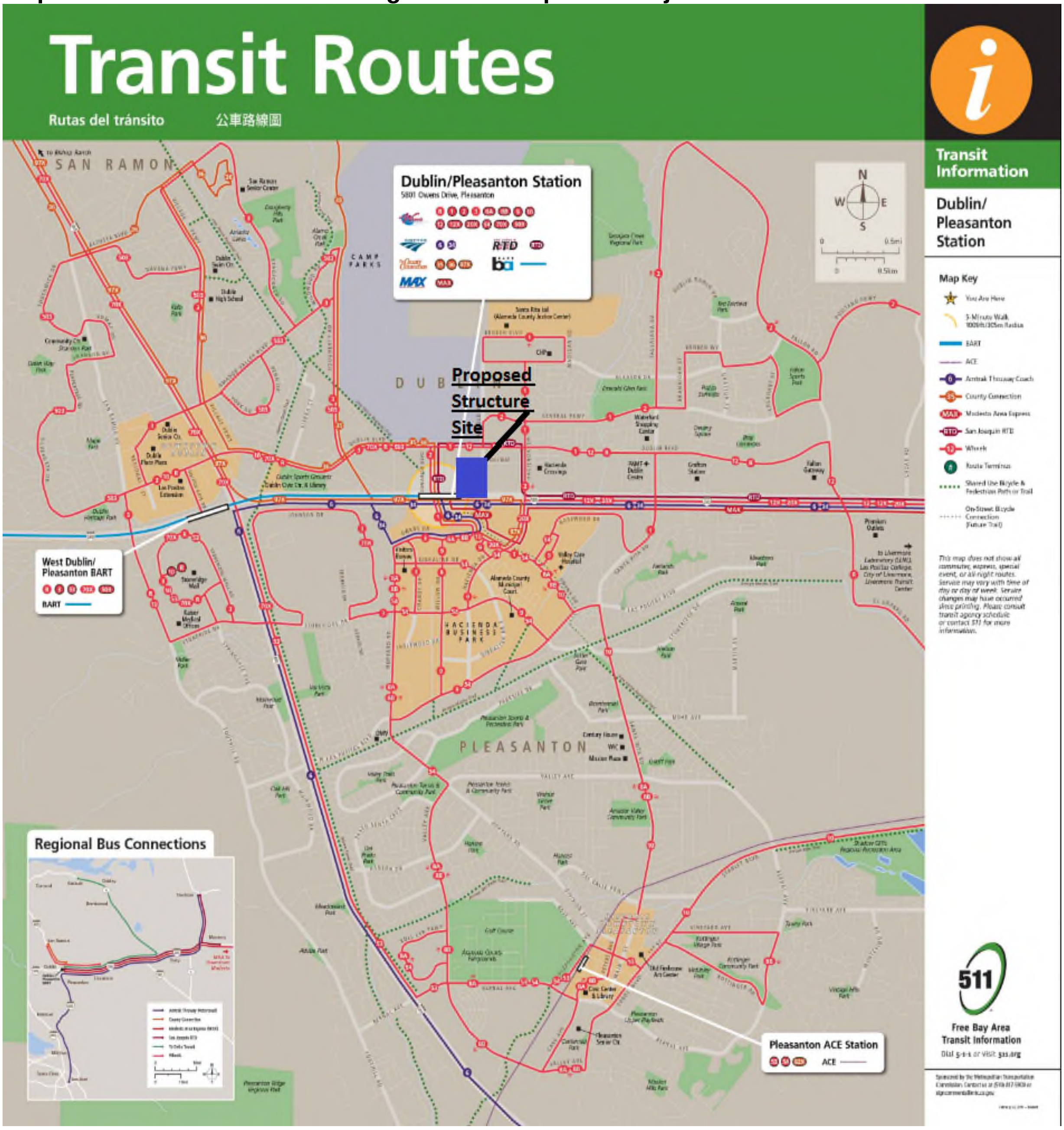
2. **Increase ridership through expanded and improved rail and transit service.** Increases in ridership for both LAVTA and BART are anticipated as a result of the construction of an additional parking structure in the proposed location. The proposed structure can accommodate a maximum of 537 spaces which represents an a minimum of a 3.59% increase in daily ridership based on LAVTA's FY16 average daily ridership of 5,737[6] and BART's estimated daily ridership average for November 2017 of 9,201[7]. This estimation is obviously low, given that it is likely that there will be both LAVTA and BART riders that turn over at some point during the day. BART reports demonstrate that 79% of Dublin/Pleasanton riders are coming to BART from home for work. Only 21% of riders are using the line from the Dublin/Pleasanton station for other reasons like travel to the airport, etc.[8] Therefore, it can be assumed that we could see an increase of up to double the minimum percentage increase in ridership daily given how many times each parking space turns over ridership during the day. The data on ridership will be closely tracked and collected through the life of the project, once construction is completed and will be reported back to TIRCP upon request.

3. **Integrate the services of the state's various rail and transit operations, including integration with the high-speed rail system.** As aforementioned, the proposed "D-1" location is a critical transit center that integrates six essential, regional transit lines that serve more than four Bay Area Counties and cover over 100 miles. The lines that run through the proposed location include: LAVTA, BART, MAX BART Express, San Joaquin RTD, and Stanislaus Regional Transit. By providing additional parking for transit riders that frequently turned away due to a lack of parking, we will further integrate the associated transit lines. Additionally, the Dublin/Pleasanton BART line, which many LAVTA riders connect to for their daily commute, provides a direct connection to the proposed high-speed rail system due to its integration with the Caltrain station at 4th & King in San Francisco. Increasing access to rapid transit options with further facilitate commuters that are seeking to utilize transit options but also encourage the use of innovative or alternative transportation options like vanpools. The garage design will include preferred parking for vanpools and electric charging stations. The goal of the garage location and increased capacity is to further integrate the many local and rapid transit options from the Tri-Valley area and surrounding regions to the San Francisco Bay Area or Silicon Valley. Map 4 below provides a visual depiction of the integration of services between LAVTA, BART, ACE, Amtrak, County Connection, Modesto Area Express (MAX), and San Joaquin RTD. The proposed project site is denoted by the blue square. As depicted in Map 4, the proposed structure is located at the true intersection of

[6] *Wheels Facts and Figures 2015.* Livermore Amador Valley Transit Agency, 2016.
[7] November 2017 Daily Ridership Report. Bay Area Rapid Transit, 2017. http://64.111.127.166/ridership/
[8] 2015 BART Ridership by Station Report. BART, 2015. https://www.bart.gov/about/reports/profile

22 different local and regional lines that bring individuals from throughout the Tri-Valley Area, Contra Costa, and San Joaquin County to the Dublin/Pleasanton BART station, providing them direct access to a rail system that serves the greater east bay and San Francisco Bay Area.

Map 4. LAVTA Transit Route Integration & Proposed Project Site[9]



[9] Wheels Transit Routes, 2015. Livermore Amador Valley Transit Authority, 2015. http://www.wheelsbus.com/wp-content/uploads/2015/08/HSP_DP-routes.jpg

There are also significant co-benefits of this project that support the implementation of sustainable communities’ strategies through the following:

a. Increasing the parking capacity adjacent to the Dublin/Pleasanton BART station and the associated transit lines will reduce vehicle miles traveled from automobiles specifically through the I-580, I-880, and 80 corridors. These are some of the Country’s most congested freeways and a growth in transit ridership, as a result of the additional 537 parking spaces will result in a reduction of automobile trips to congested areas throughout the San Francisco Bay Area and Silicon Valley.
b. As noted above, the Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program will enhance the connectivity, integration and coordination of numerous transit systems both local and regional. Upon development, the Dublin/Pleasanton line will serve as a connector to the proposed High-Speed Rail System that will run from San Fracisco’s 4th and King CalTrain station.
c. A percentage of the parking spaces in the proposed structure will be reserved for clean vehicle parking through electric vehicle charging stations. The electric charging stations will be an extension of Alameda County’s existing electric vehicle charging program. As a part Alameda County’s Sustainability program, Electric Vehicle drivers can charge their vehicles at County-owned parking garages and lots throughout the County. The County provides Dual Level 1 and Level II charging stations and at certain locations Direct Current (DC) fast chargers are available. As a DOE workplace Charging Partner, Alameda County has committed to adding EV charging options at each of their major parking lots and garages by 2017.
d. The LAVTA and BART lines service populations that are significantly impacted and have a have a high percentage of low-income households or households living below the federal poverty line. One such community is Tracy, situated 26.9 miles east of the Dublin/Pleasanton BART Station – Census Tract 6077005308. This community has been identified by CalEPA as a disadvantaged community. A significant percentage of Dublin/Pleasanton BART and LAVTA riders access the area from Tracy. Increased parking would significantly impact this community and provide significantly more access to rapid transit for these individuals that are community to the Bay Area or Silicon Valley. Additionally, as previously noted, the reduction in GHG emissions will be broad reaching given that many commuters to the inner parts of Alameda County, San Francisco and Silicon Valley will experience a reduction in congestion as a result of increased parking capacity.

F. **Disadvantaged Communities**

Benefits to Disadvantaged communities. The quantifiable benefits to disadvantaged communities will be direct and meaningful. The primary benefit is increased access to local and rapid transit options as a connection to larger geographic areas with more economic opportunities. Per the TIRCP calculation tool provided, the co-benefits will be documented through ridership by ticket category purchased and Passenger VMT reductions in miles. Based on the results of the calculator, the projected co-benefits of the parking structure equate to 4lbs of ROG Emission Reductions, 19lbs NO_x Emission Reductions and 3lbs Diesel PM Emission Reductions. For a relatively minimal investment in infrastructure, the benefits are significant. Throughout the construction of the parking structure, engagement of local community members and specifically disadvantaged community members will be obtained through regular community meetings and hearings that are required as a result of the GSA bidding and construction process. These meetings will allow for public input in the planning and design of the project that is intended to meet their greatest needs. We will do everything possible to ensure that low-income households are represented at these meetings to ensure the projected benefits are indeed meaningful to them. Meetings will be held in various locations throughout Alameda County to ensure access is equitable for impacted communities. The meetings and associated budget are outlined in the Statement of Work below.

G. Project Implementation and Project Management

LAVTA will be the lead transit applicant for the Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program, but all construction and operation responsibility will be contracted out to the Alameda County GSA. Upon finalization of an agreement between LAVTA and GSA, GSA will begin pre-construction efforts and the bidding process. See the Statement of Work Document for a detailed breakdown of the project implementation and management schedule. Upon receipt of award, the following deliverables will be completed on a structured and reasonable timeline:

- **Phase 1 – Alameda County GSA**
    - Design Utilities/Demo –April 2018
    - Board of Supervisors Approval Bidding Utilities –August 2018
    - Bid Award Utilities/Demo –October 2018
    - PG&E Coordination – October 2018
    - **GROUND BREAKING – October 2018**
    - Complete Utilities/Demo – January 2019
- **Phase 2 – Alameda County GSA**
    - RFQ/RFP Design/Build Bridging – August 2018
    - Design/Build Bridging Doc. – August 2018
    - Design/Build Bridging Bidding – December 2018
    - EIR/CEQA/Negative Declaration – January 2019
- **Design-Build Construction – Contractor to Alameda County GSA**
    - Begins May 2019
    - Completes December 2019
- **LAVTA Board and Alameda County Board of Supervisors Accepts Occupancy/Completion**
    - February 2020

H. Project Readiness and Reasonability

LAVTA and Alameda County GSA are ready and fully committed to begin the design and construction of the proposed project as demonstrated by the attached letters of support. There is comprehensive and sufficient agreement from the LAVTA Board of Directors and the Alameda County Board of Directors and GSA leadership to implement this project as proposed. The proposed project site, D-1, is fully committed to the project as demonstrated by the attached letter of support from the Alameda County Board of Supervisors. The site has had initial environmental readiness assessments completed but the County is prepared to complete all required environmental protection and readiness assessments and modifications upon approval of the award. If awarded, LAVTA and Alameda County are fully committed to beginning implementation of the proposed project per the attached project schedule. All implementing partners are in agreement that the timeline and costs of the project are reasonable.

2018 Transit & Intercity Rail Capital Program Project Proposal
“Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program”
Statement of Work

I. Project Scope

1. The Livermore Amador Valley Transit Authority (LAVTA) is requesting funding from TIRCP in support of the Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program which will be constructed and operationally maintained by Alameda County GSA, as the co-applicant. GSA will plan and manage the construction process, own, and operate the garage upon completion. The County will utilize a 2-Phase Design-Build project delivery system in order to complete the proposed parking structure at the D-1 site in the most streamlined way. Total project costs are calculated at $34 million - $20 million from TIRCP funding and $14 million, $7 million of which is committed through Metropolitan Transportation Commission (MTC) funding and the remaining $7 million has been committed through the Alameda County Transportation Commission (ACTC). The completed structure will be a multi-level, convertible parking garage built on a 2.46-acre parcel in the City of Dublin adjacent to the I-580 freeway and the Dublin/Pleasanton BART station. The timeline for construction will be as follows. See Attachment for more detailed timelines, milestones and deliverables.
    a. **Phase 1 – Alameda County GSA**
        i. Design Utilities/Demo –April 2018
        ii. Board of Supervisors Approval Bidding Utilities –August 2018
        iii. Bid Award Utilities/Demo –October 2018
        iv. PG&E Coordination – October 2018
        v. **GROUND BREAKING – October 2018**
        vi. Complete Utilities/Demo – January 2019
    b. **Phase 2 – Alameda County GSA**
        i. RFQ/RFP Design/Build Bridging – August 2018
        ii. Design/Build Bridging Doc. – August 2018
        iii. Design/Build Bridging Bidding – December 2018
        iv. EIR/CEQA/Negative Declaration – January 2019
    c. **Design-Build Construction – Contractor to Alameda County GSA**
        i. Begins May 2019
        ii. Completes December 2019
    d. **LAVTA Board and Alameda County Board of Supervisors Accepts Occupancy/Completion**
        i. February 2020

2. **Project Location**

The proposed parking structure will be located in the City of Dublin on a 2.46-acre parcel of Alameda County-owned land, adjacent to the Dublin-Pleasanton BART station. The Dublin/Pleasanton station is unique in that it straddles the border of Dublin and Pleasanton on Interstate 580 and as noted above, features a number of local and regional bus connections. The Dublin/Pleasanton transit center provides access to public rapid transit to hundreds of thousands of riders throughout Alameda County, a region that includes cities with the highest poverty levels in the state. In the city of Oakland, one of Alameda County’s most populated cities, more than 20% of people live at or below the

Federal Poverty Line.[1] The increased access to transit options and environmental benefits will directly impact disadvantaged communities throughout Alameda County.

3. **Project Maps**
   a. **Project Location Denoting Project Site**
   Map 5, below, is a depiction of the project site. The proposed site is named "D-1." It is an Alameda County-owned parcel of land that has been committed by the Alameda County Board of Supervisors as the site for this project. Attached is a KML file for the project with the transit route/project locations represented by lines.

Map 5. Project Site – D-1 Parcel Proposed Site

   b. **Project Location Denoting Disadvantaged Communities, Low-Income Communities, and/or Low-Income Households that will benefit from the project.**
      i. The proposed project location, D-1 serves a number of census tracts that have been identified as containing a significant percentage of disadvantaged communities and/or low-income households. These Census tracts include but are not limited to: 6077005206 (disadvantaged), 6077005202 (disadvantaged), 6077003900 (low-income community), 6001409000 (low-income), 6099003300 (low-income). Map 6 is a depiction of the service areas and proposed project

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[1] United States Census Bureau. Quick Facts: Oakland city, California, 2015. https://www.census.gov/quickfacts/fact/table/oaklandcitycalifornia/PST045216

site from the CARB website that identifies disadvantaged communities for the purposes of California Climate Investments. By this definition:

1. Disadvantaged Communities are those Census tracts in the top 25 percent of CalEnviroScreen 3.0 scores, plus those census tracts that score in the highest 5 percent of CalEnviroScreen’s Pollution Burden without an overall CalEnviroScreen score.
2. Low-income Communities – Census tracts that are either at or below 80 percent of the statewide median income, or at, or below the threshold designated as low-income by the CA Department of Housing and Community Development’s 2016 State Income Limits.
3. Low-Income Buffer Regions – Low-income communities as identified in (2) that are also with a ½ mile of a disadvantaged community as defined in (1).

ii. For further reference, Map 7 is a depiction of BART’s largest customer survey, the Station Profile Survey, that was most recently conducted in Spring 2015. The map shows the home locations of BART Riders in accordance to the station they most frequently use. In this case, the point of ideal reference is the Dublin/Pleasanton station as denoted on the I-580 corridor.

c. Greenhouse Gas (GHG) Reducing Features

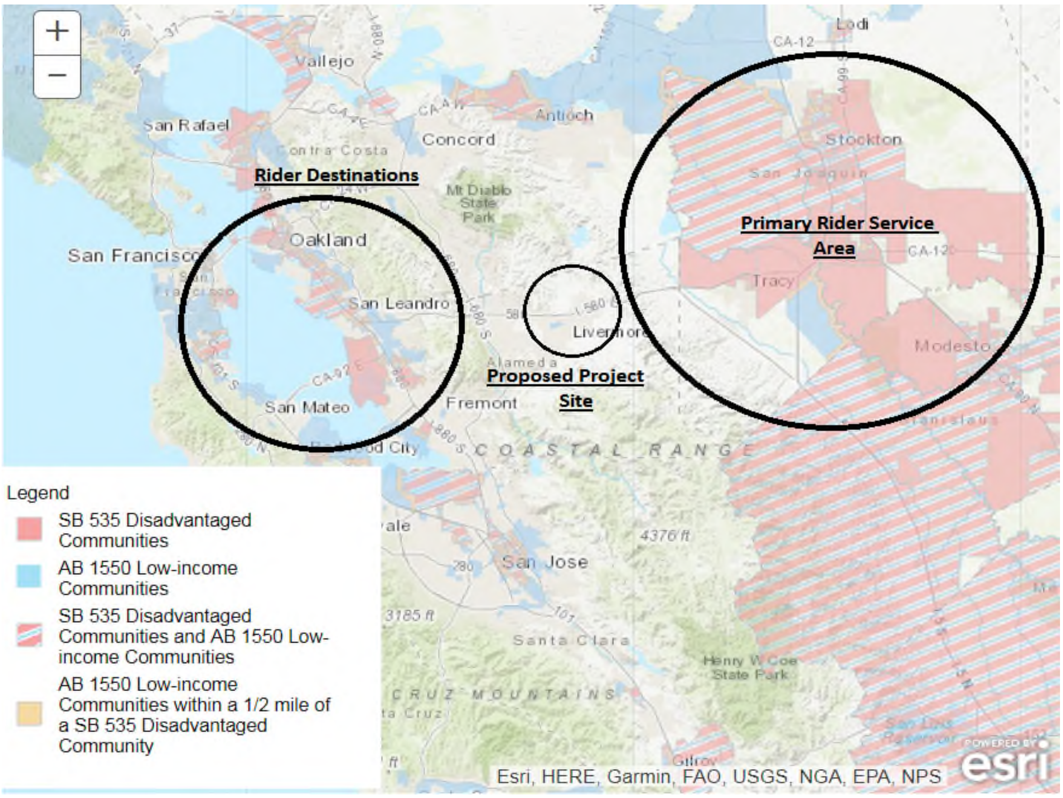
As noted, the proposed location, D-1 is a rapidly growing, congested transit center that serves as an intersection of six local and regional transit lines that include local bus lines, Amtrak rail lines, and BART. There are a number of GHG reducing features proposed through this Dublin/Pleasanton Capacity Improvement & Congestion Reduction Effort. These features include:

i. Convertible Garage Design – the proposed design of the parking structure will be a multi-level, convertible garage that recognizes the reducing long-term sustainability of parking structures. As individual vehicle ownership rates decline, the need for large-scale parking structures, also declines. Therefore, the overall life of the parking structure diminishes when need no longer exists. Keeping this in mind, the Alameda GSA team will be bidding out for a Design-Build contractor that will design and construct a parking structure that can be converted to housing and/or office space when the need for parking diminishes. This will impact GHG emissions significantly and is a key sustainability feature of the proposed garage.

ii. Priority Vanpool Parking – As noted in the Project Narrative, a key feature of the proposed parking structure will be priority vanpool parking for the numerous vanpool providers that facilitate rider transit through the Dublin/Pleasanton BART Station. BART is collaborating with the Metropolitan Transportation Commission (MTC) and Scoop Technologies to maximize the efficiency of parking lots through carpooling. Additionally, the 511 RideMatch Service provides thousands of Bay Area commuters with access to vanpool services. In an effort to further reduce GHC emissions by reducing individual vehicle use and reducing congestion, vanpools will be provided guaranteed and/or priority parking as they access the plethora of transit lines available at the proposed site.

iii. Electric Vehicle Charging Stations – In an effort to encourage innovative transportation options, Level 1 and 2, electric vehicle charging stations will be provided at the parking structure as a part of the Alameda County Sustainability Initiative. By promoting the use of electric vehicles throughout Alameda County, this program will significantly reduce GHG emissions throughout the County, especially in those areas where disadvantaged and low-income communities are impacted.

Map 6 – Project Location Depiction Denoting Surrounding Service Areas Identified as Disadvantaged or Low-Income. [2]



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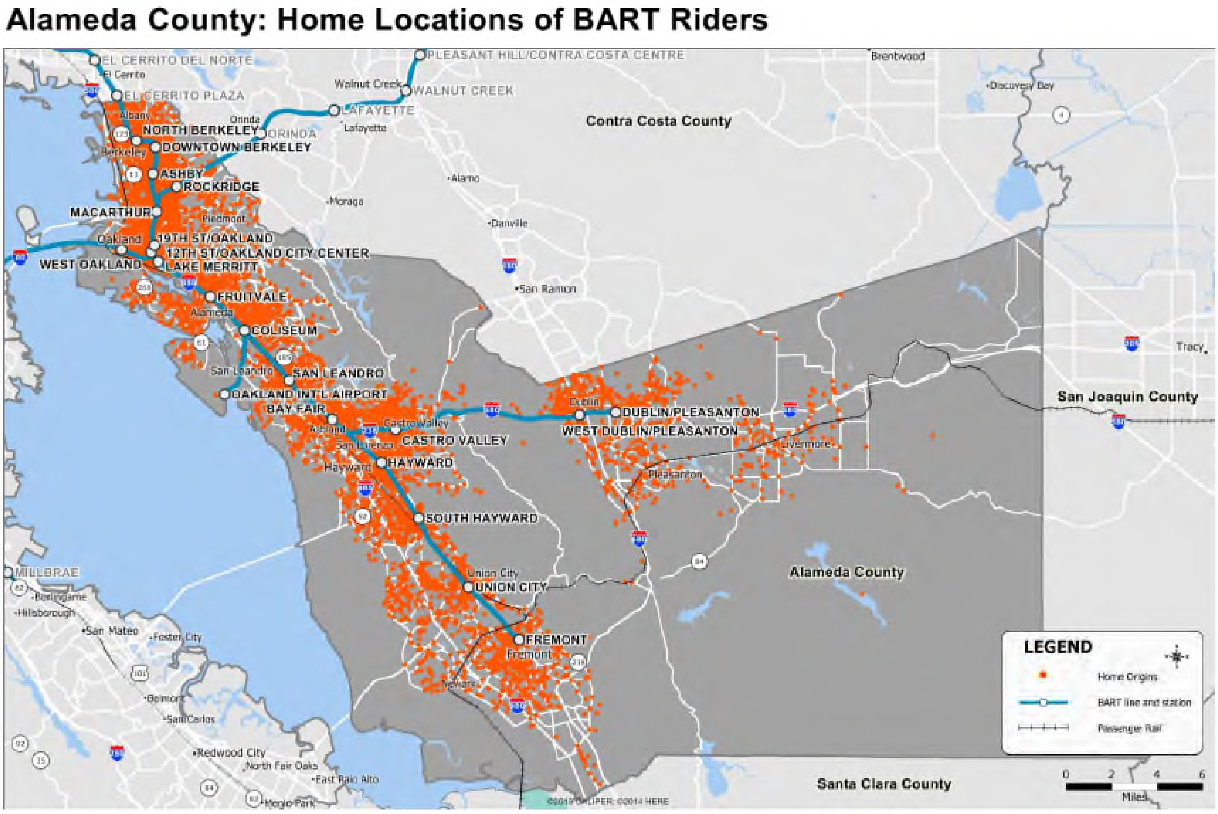
[2] "Disadvantaged and Low-Income Communities Investments: Senate Bill 535 and Assembly Bill 1550 Implementation." California Air Resources Board, 2017. https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/communityinvestments.htm

Map 7. Alameda County: Home Locations of BART Riders[3]



2015 BART Station Profile Study (weekday). Data shown on this map are not weighted.

II. **Project Costs**

a. **Transit and Intercity Rail Capital Program Funding Requested:** $20,000,000
b. **Non-Transit and Intercity Rail Capital Program Matching Funds from Metropolitan Transportation Commission (MTC) and Alameda County Transportation Commission (ACTC) Funds:** $14,000,000
c. **Total Project Cost:** $34,000,000

Below is a detailed breakdown of project cost by Fiscal Year. Further detail on project cost is included in Attachment 4 on the Project Programming Request Form (PPR) as required. Project cost estimates are escalated to the year of proposed delivery (2020). Description of amount and committed funding detail is listed below. The amount of total TIRCP funding requested is $34,000,000 and the design/build process will occur in 2 phases. Alameda County will provide all up-front costs and has committed to providing all ongoing costs for maintenance and operations through the life of the proposed structure.

[3] *2015 BART Station Profile Study (weekday)*. BART, 2015. https://www.bart.gov/about/reports/profile

2018 Transit & Intercity Rail Capital Program Project Proposal
"Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program"
Statement of Work

d. Detailed Cost Breakdown by Fiscal Year

District	County	Route	EA	Project ID	PPNO	
1	Alameda	580				
Project Title:	Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program					

Proposed Total Project Cost ($1,000s)									Notes
Component	Prior	14/15	15/16	16/17	17/18	18/19	19/20+	Total	The project will utilize a 2-Phase Design-Build (D/B) delivery method. The D/B design for demolition and utilities will start in April 2018. The D/B parking structure design will start in August, 2018.
E&P (PA&ED)						300	300	600	
PS&E						1,000	1,600	2,600	
R/W SUP (CT)									
CON SUP (CT)									
R/W						200	200	400	
CON						1,400	29,000	30,400	
TOTAL						2,900	31,100	34,000	

III. Project Schedule

See Attachment 3 for the Complete Project Schedule with Tasks, Milestones and Deliverables. Ground-breaking for the proposed project is scheduled to commence no later than October 2018 with a projected completion and occupancy in February 2020.

IV. Description of Funding Sources

TIRCP Request - $20 million

Leveraged Matching Funds - $14 million

Initial operating funds for the proposed project, maintenance and ongoing operations of the completed structure will be provided by Alameda County as demonstrated by the attached Letter of Support. No additional funding for the proposed project beyond that provided in the initial grant or cooperative agreement will be requested from TIRCP. Leveraged matching funds of $14 million have been committed through existing MTC and ACTC funding as noted above. The breakdown of committed matching funds is as follows, governing resolutions can be provided upon approval of the grant request. As required, a completed Project Programming Request (PPR Form) is attached as Attachment 4.

- **$7 million** – Metropolitan Transportation Commission (MTC) Funding
  - The Metropolitan Transportation Commission (MTC) crafts the long-range Plan Bay Area and other targeted plans, and champions the projects and initiatives aimed at fulfilling these visions. MTC establishes regional funding priorities and allocates some $1.5 billion annually to public transit, highways, local streets and roads, freight facilities, and bicycle pedestrian routes. Through Alameda County's MTC allocation, funding has been committed to this project.
- **$7 million** – Alameda County Transportation Commission (ACTC)

- o Alameda County CTC (ACTC) coordinates countywide transportation planning efforts; programs local, regional, state and federal funding; and delivers projects and programs including those approved by voters in Alameda County transportation expenditure plans for Measure B, Measure BB and the Vehicle Registration Fee. Funding from ACTC has been committed to this program as leveraged matching funds.
- **Total Matching Funds: $14 million**
- **Total Cost for Dublin/Pleasanton Capacity Improvement and Congestion Relief Project: $34 million**

V. **Separable or Scalable Elements**

As noted in Attachment 3, the Project Schedule is divided into two phases. However, there are no separable or scalable elements to the proposed project. The parking structure will need to be completed as proposed and the scope of the project has not been changed since the most recent state or federal programming action. Scaling the project is not practical because it would not achieve the desired traffic congestion reduction outcomes and currently the space is vacant.

California Air Resources Board
Calculator Tool for the
California State Transportation Agency
Transit and Intercity Rail Capital Program
Greenhouse Gas Reduction Fund
Fiscal Year 2018-19

The California Air Resources Board (CARB) is responsible for providing the quantification methodology to estimate the greenhouse gas (GHG) emission reductions and other non-GHG outcomes, referred to as co-benefits (e.g., air pollutant emission estimates), from projects receiving monies from the Greenhouse Gas Reduction Fund (GGRF).

CARB released the California State Transportation Agency (CalSTA) Transit and Intercity Rail Capital Program (TIRCP) Draft Quantification Methodology and Draft TIRCP Calculator Tool for Fiscal Year (FY) 2018-19 for public comment in September 2017. The Draft Quantification Methodology and Draft TIRCP Calculator Tool were updated as necessary to reflect stakeholder comments and final TIRCP Guidelines for FY 2018-19. This Final TIRCP Calculator Tool accompanies the Final Quantification Methodology for FY 2018-19, available at:
www.arb.ca.gov/cci-quantification

Instructions: Applicants must use this calculator to estimate the GHG emission reductions and air pollutant emissions associated with the quantification methodology, as applicable. This Excel file must be submitted with other documentation requirements. Please use the following file naming convention: "[Project Name]_calc" not to exceed 20 characters. Project names may be abbreviated. Additional documentation may be necessary to substantiate the inputs to this file. Fields highlighted in yellow indicate input needed by the project applicant.

Step 1 Define the Project: Applicants must define the project by identifying both eligible project types in Table 2 of the Quantification Methodology and the number of quantifiable components.

Step 2 Determine the TIRCP Calculator Tool Inputs Needed: The applicant will use Table 3 in the Quantification Methodology to determine the required data inputs to estimate the GHG emission reductions and air pollutant emission co-benefits for each quantifiable component by project type, as identified in Step 1.

Step 3 Estimate the GHG Emission Reductions and Air Pollutant Emissions for the Proposed Project for Each Component Using the TIRCP Calculator Tool: The applicant will enter the required data inputs identified in Step 2 into this TIRCP Calculator Tool to calculate the GHG emission reductions and air pollutant emission estimates of the proposed project.

Read Me Tab (this page):
Enter the Project Name and the contact information for person who can answer project-specific questions on the quantification calculations.

Project Name:	Dublin/Pleasanton Capacity Improvement Program
Contact Name:	Michael Tree
Contact Phone Number:	(925) 455-7564
Contact Email:	mtree@lavta.org
Date Completed:	1/10/2018

Quantifiable Component Tabs:
Cells in yellow with headers in red indicate a direct user input is required. Cells in red indicate a direct user input is optional (note: additional supporting documentation is required if used). Green fields indicate a selection from a drop-down box is required. Gray fields indicate output or calculation fields that are automatically populated based on user entries and the quantification methods.

For each component, applicants must work from top to bottom and enter all relevant data. Some cells may not be applicable to the project type; these cells will turn black and lock. Applicants should use one tab per quantifiable component and may use as many tabs as necessary to characterize all relevant components of the proposed project, including additional GGRF funding requested from other California Climate Investments (CCI) programs. A component is a project type for which GHG emission reductions and air pollutant emissions may be estimated, evaluated and reported separately from other components within the TIRCP project. Inputs must be substantiated in the documentation provided to CalSTA and CARB; see Section C. Documentation of the Quantification Methodology.

Submit documentation: Save file for submittal. See Section C. Documentation of the Quantification Methodology for additional documentation requirements.

For more information on CARB's efforts to support implementation of GGRF investments, see: http://www.arb.ca.gov/caclimateinvestments
Questions pertaining to TIRCP should be sent to: TIRCPcomments@dot.ca.gov
Questions on this calculator should be sent to : GGRFProgram@arb.ca.gov

California Air Resources Board
Calculator Tool for the
California State Transportation Agency
Transit and Intercity Rail Capital Program
Greenhouse Gas Reduction Fund
Fiscal Year 2018-19

Project Name:	Dublin/Pleasanton Capacity Improvement Program

Input	Description	Quantified Component 1	
Identifying Descriptor (ID)	Brief description of the quantifiable component identifying it from other separable components.	Increased Ridership	
Funding Inputs			
TIRCP Funds Requested	Total TIRCP funds requested for this separable component.	$20,000,000	
Multi-Year	Will this component request several California Transportation Commission allocations over multiple calendar years?	yes	
Additional CCI Program 1			
CCI Program	Other CCI Program from which project has or will be requesting GGRF funds.		
Additional GGRF Funds	Total GGRF funds requested or to be requested from Additional CCI Program 1.		
Additional CCI Program 2			
CCI Program	Other CCI Program from which project has or will be requesting GGRF funds.		
Additional GGRF Funds	Total GGRF funds requested or to be requested from Additional CCI Program 2.		
Total GGRF Funds Requested	Total GGRF funds requested from all CCI Programs	$20,000,000	
Project Inputs			
Project Type	For the purposes of this quantification, eligible TIRCP projects fall into four project types. Select the project type that best describes this component.	System and Efficiency Improvements	
Service Type	The transit service (e.g., Intercity/Express Bus (Long Distance), Light Rail, Vanpool, etc.) directly associated with the proposed project. For projects that serve multiple services, select Multi-modal.	Multi-modal	
Vehicle Type	The vehicle type (e.g., Transit Bus, Streetcar, Ferry, etc.) that will operate the new service or will be procured.		
Region	The region that best encompasses the geographic location for the proposed project type.	County	
Sub region	The County or Air Basin where the majority of the service occurs.	Alameda	
Year 1 (Yr1)	The first year of service or the first year the facility or rolling stock will be in use.	2020	
Year F (YrF)	The final year of service or the final year the facility or rolling stock's useful life.	2060	
Useful Life	The number of years the service is funded or the useful life of the facility or rolling stock.	40	
Displaced Autos Inputs		**Input**	**Reference**
Yr1 Ridership	The increase in unlinked passenger trips directly associated with the proposed project in the first year (Yr1).	537	Parking Space Increase
YrF Ridership	The increase in unlinked passenger trips directly associated with the proposed project in the final year. If the ridership is not expected to change, Yr1 and YrF should be the same value.	537	Parking Space Increase
Adjustment Factor (A)	Discount factor applied to annual ridership to account for transit-dependent riders. Use: document project-specific data or system average developed from a recent, statistically valid survey or default.	0.5	Local Bus Adjustment Factor
Length of Average Trip (L)	Annual passenger miles over unlinked trips directly associated with the proposed project.	14.4	BART Reported Avg. Trip Miles
New/Expanded Service Vehicle Inputs		**Input**	**Reference**
Hybrid Vehicle	Is the vehicle for the new/expanded service, or vehicle(s) to be procured, a hybrid?		
Fuel Type	The fuel type (e.g., electric, diesel, etc.) of the vehicle for the new/expanded service, or of the new vehicle(s) to be procured.		
Model Year	The engine model year of the vehicle that will operate the new/expanded service, or of the new vehicle(s) to be procured.		

Project-Specific Emission Factor	If used, applicant must be able to demonstrate an approved carbon intensity value under the Low Carbon Fuel Standard and submit additional documentation.		
Annual VMT	The estimated annual VMT required to operate the new/expanded service or of the new vehicle(s) to be procured (e.g., 72,000). For rail and ferry vehicles, applicants may alternatively use Annual Fuel.		
Annual Fuel	The estimated annual fuel (i.e., gallon of diesel, KWh of electricity) required to operate the new/expanded service, or of the new rail or ferry vehicle(s) to be procured (e.g., 26,000).		
Displaced Vehicle/Fuel Reductions Inputs		**Input**	**Reference**
Fuel Type	The fuel type (e.g., electric, diesel, etc.) of the displaced vehicle(s) or of fuel reductions as a result of the project.		
Model Year	The average engine model year(s) of the displaced vehicle(s) or of the vehicle(s) to realize fuel reductions as a result of the project.		
Annual VMT	The estimated annual VMT of the displaced vehicle(s). For rail and ferry vehicles, applicants may alternatively use Annual Fuel.		
Annual Fuel	The estimated annual fuel reductions expected to be realized as a result of the project or the estimated annual fuel the displaced vehicle(s) would have required to operate the equivalent as the new vehicle to be procured.		

California Air Resources Board
Calculator Tool for the
California State Transportation Agency
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Greenhouse Gas Reduction Fund
Fiscal Year 2018-19

Project Name:	Dublin/Pleasanton Capacity Improvement Program

Input	Description	Quantified Component 2	
Identifying Descriptor (ID)	Brief description of the quantifiable component identifying it from other separable components.		
Funding Inputs			
TIRCP Funds Requested	Total TIRCP funds requested for this separable component.		
Multi-Year	Will this component request several California Transportation Commission allocations over multiple calendar years?		
Additional CCI Program 1			
CCI Program	Other CCI Program from which project has or will be requesting GGRF funds.		
Additional GGRF Funds	Total GGRF funds requested or to be requested from Additional CCI Program 1.		
Additional CCI Program 2			
CCI Program	Other CCI Program from which project has or will be requesting GGRF funds.		
Additional GGRF Funds	Total GGRF funds requested or to be requested from Additional CCI Program 2.		
Total GGRF Funds Requested	Total GGRF funds requested from all CCI Programs		
Project Inputs			
Project Type	For the purposes of this quantification, eligible TIRCP projects fall into four project types. Select the project type that best describes this component.		
Service Type	The transit service (e.g., Intercity/Express Bus (Long Distance), Light Rail, Vanpool, etc.) directly associated with the proposed project. For projects that serve multiple services, select Multi-modal.		
Vehicle Type	The vehicle type (e.g., Transit Bus, Streetcar, Ferry, etc.) that will operate the new service or will be procured.		
Region	The region that best encompasses the geographic location for the proposed project type.		
Sub region	The County or Air Basin where the majority of the service occurs.		
Year 1 (Yr1)	The first year of service or the first year the facility or rolling stock will be in use.		
Year F (YrF)	The final year of service or the final year the facility or rolling stock's useful life.		
Useful Life	The number of years the service is funded or the useful life of the facility or rolling stock.		
Displaced Autos Inputs		**Input**	**Reference**
Yr1 Ridership	The increase in unlinked passenger trips directly associated with the proposed project in the first year (Yr1).		
YrF Ridership	The increase in unlinked passenger trips directly associated with the proposed project in the final year. If the ridership is not expected to change, Yr1 and YrF should be the same value.		
Adjustment Factor (A)	Discount factor applied to annual ridership to account for transit-dependent riders. Use: document project-specific data or system average developed from a recent, statistically valid survey or default.		
Length of Average Trip (L)	Annual passenger miles over unlinked trips directly associated with the proposed project.		
New/Expanded Service Vehicle Inputs		**Input**	**Reference**
Hybrid Vehicle	Is the vehicle for the new/expanded service, or vehicle(s) to be procured, a hybrid?		
Fuel Type	The fuel type (e.g., electric, diesel, etc.) of the vehicle for the new/expanded service, or of the new vehicle(s) to be procured.		
Model Year	The engine model year of the vehicle that will operate the new/expanded service, or of the new vehicle(s) to be procured.		

Project-Specific Emission Factor	If used, applicant must be able to demonstrate an approved carbon intensity value under the Low Carbon Fuel Standard and submit additional documentation.	[redacted]	[redacted]
Annual VMT	The estimated annual VMT required to operate the new/expanded service or of the new vehicle(s) to be procured (e.g., 72,000). For rail and ferry vehicles, applicants may alternatively use Annual Fuel.	[redacted]	[redacted]
Annual Fuel	The estimated annual fuel (i.e., gallon of diesel, KWh of electricity) required to operate the new/expanded service, or of the new rail or ferry vehicle(s) to be procured (e.g., 26,000).	[redacted]	[redacted]
Displaced Vehicle/Fuel Reductions Inputs		**Input**	**Reference**
Fuel Type	The fuel type (e.g., electric, diesel, etc.) of the displaced vehicle(s) or of fuel reductions as a result of the project.	[redacted]	
Model Year	The average engine model year(s) of the displaced vehicle(s) or of the vehicle(s) to realize fuel reductions as a result of the project.	[redacted]	
Annual VMT	The estimated annual VMT of the displaced vehicle(s). For rail and ferry vehicles, applicants may alternatively use Annual Fuel.	[redacted]	[redacted]
Annual Fuel	The estimated annual fuel reductions expected to be realized as a result of the project or the estimated annual fuel the displaced vehicle(s) would have required to operate the equivalent as the new vehicle to be procured.	[redacted]	[redacted]

California Air Resources Board
Calculator Tool for the
California State Transportation Agency
Transit and Intercity Rail Capital Program
Greenhouse Gas Reduction Fund
Fiscal Year 2018-19

Cap and Trade Dollars at Work

Project Name:	Dublin/Pleasanton Capacity Improvement Program

Input	Description	Quantified Component 3	
Identifying Descriptor (ID)	Brief description of the quantifiable component identifying it from other separable components.		
Funding Inputs			
TIRCP Funds Requested	Total TIRCP funds requested for this separable component.		
Multi-Year	Will this component request several California Transportation Commission allocations over multiple calendar years?		
Additional CCI Program 1			
CCI Program	Other CCI Program from which project has or will be requesting GGRF funds.		
Additional GGRF Funds	Total GGRF funds requested or to be requested from Additional CCI Program 1.		
Additional CCI Program 2			
CCI Program	Other CCI Program from which project has or will be requesting GGRF funds.		
Additional GGRF Funds	Total GGRF funds requested or to be requested from Additional CCI Program 2.		
Total GGRF Funds Requested	Total GGRF funds requested from all CCI Programs		
Project Inputs			
Project Type	For the purposes of this quantification, eligible TIRCP projects fall into four project types. Select the project type that best describes this component.		
Service Type	The transit service (e.g., Intercity/Express Bus (Long Distance), Light Rail, Vanpool, etc.) directly associated with the proposed project. For projects that serve multiple services, select Multi-modal.		
Vehicle Type	The vehicle type (e.g., Transit Bus, Streetcar, Ferry, etc.) that will operate the new service or will be procured.		
Region	The region that best encompasses the geographic location for the proposed project type.		
Sub region	The County or Air Basin where the majority of the service occurs.		
Year 1 (Yr1)	The first year of service or the first year the facility or rolling stock will be in use.		
Year F (YrF)	The final year of service or the final year the facility or rolling stock's useful life.		
Useful Life	The number of years the service is funded or the useful life of the facility or rolling stock.		
Displaced Autos Inputs		**Input**	**Reference**
Yr1 Ridership	The increase in unlinked passenger trips directly associated with the proposed project in the first year (Yr1).		
YrF Ridership	The increase in unlinked passenger trips directly associated with the proposed project in the final year. If the ridership is not expected to change, Yr1 and YrF should be the same value.		
Adjustment Factor (A)	Discount factor applied to annual ridership to account for transit-dependent riders. Use: document project-specific data or system average developed from a recent, statistically valid survey or default.		
Length of Average Trip (L)	Annual passenger miles over unlinked trips directly associated with the proposed project.		
New/Expanded Service Vehicle Inputs		**Input**	**Reference**
Hybrid Vehicle	Is the vehicle for the new/expanded service, or vehicle(s) to be procured, a hybrid?		
Fuel Type	The fuel type (e.g., electric, diesel, etc.) of the vehicle for the new/expanded service, or of the new vehicle(s) to be procured.		
Model Year	The engine model year of the vehicle that will operate the new/expanded service, or of the new vehicle(s) to be procured.		

Project-Specific Emission Factor	If used, applicant must be able to demonstrate an approved carbon intensity value under the Low Carbon Fuel Standard and submit additional documentation.		
Annual VMT	The estimated annual VMT required to operate the new/expanded service or of the new vehicle(s) to be procured (e.g., 72,000). For rail and ferry vehicles, applicants may alternatively use Annual Fuel.		
Annual Fuel	The estimated annual fuel (i.e., gallon of diesel, KWh of electricity) required to operate the new/expanded service, or of the new rail or ferry vehicle(s) to be procured (e.g., 26,000).		
Displaced Vehicle/Fuel Reductions Inputs		**Input**	**Reference**
Fuel Type	The fuel type (e.g., electric, diesel, etc.) of the displaced vehicle(s) or of fuel reductions as a result of the project.		
Model Year	The average engine model year(s) of the displaced vehicle(s) or of the vehicle(s) to realize fuel reductions as a result of the project.		
Annual VMT	The estimated annual VMT of the displaced vehicle(s). For rail and ferry vehicles, applicants may alternatively use Annual Fuel.		
Annual Fuel	The estimated annual fuel reductions expected to be realized as a result of the project or the estimated annual fuel the displaced vehicle(s) would have required to operate the equivalent as the new vehicle to be procured.		

Cap and Trade Dollars at Work

California Air Resources Board
Calculator Tool for the
California State Transportation Agency
Transit and Intercity Rail Capital Program
Greenhouse Gas Reduction Fund
Fiscal Year 2018-19

Project Name:	Dublin/Pleasanton Capacity Improvement Program

Input	Description	Quantified Component 4	
Identifying Descriptor (ID)	Brief description of the quantifiable component identifying it from other separable components.		
Funding Inputs			
TIRCP Funds Requested	Total TIRCP funds requested for this separable component.		
Multi-Year	Will this component request several California Transportation Commission allocations over multiple calendar years?		
Additional CCI Program 1			
CCI Program	Other CCI Program from which project has or will be requesting GGRF funds.		
Additional GGRF Funds	Total GGRF funds requested or to be requested from Additional CCI Program 1.		
Additional CCI Program 2			
CCI Program	Other CCI Program from which project has or will be requesting GGRF funds.		
Additional GGRF Funds	Total GGRF funds requested or to be requested from Additional CCI Program 2.		
Total GGRF Funds Requested	Total GGRF funds requested from all CCI Programs		
Project Inputs			
Project Type	For the purposes of this quantification, eligible TIRCP projects fall into four project types. Select the project type that best describes this component.		
Service Type	The transit service (e.g., Intercity/Express Bus (Long Distance), Light Rail, Vanpool, etc.) directly associated with the proposed project. For projects that serve multiple services, select Multi-modal.		
Vehicle Type	The vehicle type (e.g., Transit Bus, Streetcar, Ferry, etc.) that will operate the new service or will be procured.		
Region	The region that best encompasses the geographic location for the proposed project type.		
Sub region	The County or Air Basin where the majority of the service occurs.		
Year 1 (Yr1)	The first year of service or the first year the facility or rolling stock will be in use.		
Year F (YrF)	The final year of service or the final year the facility or rolling stock's useful life.		
Useful Life	The number of years the service is funded or the useful life of the facility or rolling stock.		
Displaced Autos Inputs		**Input**	**Reference**
Yr1 Ridership	The increase in unlinked passenger trips directly associated with the proposed project in the first year (Yr1).		
YrF Ridership	The increase in unlinked passenger trips directly associated with the proposed project in the final year. If the ridership is not expected to change, Yr1 and YrF should be the same value.		
Adjustment Factor (A)	Discount factor applied to annual ridership to account for transit-dependent riders. Use: document project-specific data or system average developed from a recent, statistically valid survey or default.		
Length of Average Trip (L)	Annual passenger miles over unlinked trips directly associated with the proposed project.		
New/Expanded Service Vehicle Inputs		**Input**	**Reference**
Hybrid Vehicle	Is the vehicle for the new/expanded service, or vehicle(s) to be procured, a hybrid?		
Fuel Type	The fuel type (e.g., electric, diesel, etc.) of the vehicle for the new/expanded service, or of the new vehicle(s) to be procured.		
Model Year	The engine model year of the vehicle that will operate the new/expanded service, or of the new vehicle(s) to be procured.		

Project-Specific Emission Factor	If used, applicant must be able to demonstrate an approved carbon intensity value under the Low Carbon Fuel Standard and submit additional documentation.		
Annual VMT	The estimated annual VMT required to operate the new/expanded service or of the new vehicle(s) to be procured (e.g., 72,000). For rail and ferry vehicles, applicants may alternatively use Annual Fuel.		
Annual Fuel	The estimated annual fuel (i.e., gallon of diesel, KWh of electricity) required to operate the new/expanded service, or of the new rail or ferry vehicle(s) to be procured (e.g., 26,000).		
Displaced Vehicle/Fuel Reductions Inputs		**Input**	**Reference**
Fuel Type	The fuel type (e.g., electric, diesel, etc.) of the displaced vehicle(s) or of fuel reductions as a result of the project.		
Model Year	The average engine model year(s) of the displaced vehicle(s) or of the vehicle(s) to realize fuel reductions as a result of the project.		
Annual VMT	The estimated annual VMT of the displaced vehicle(s). For rail and ferry vehicles, applicants may alternatively use Annual Fuel.		
Annual Fuel	The estimated annual fuel reductions expected to be realized as a result of the project or the estimated annual fuel the displaced vehicle(s) would have required to operate the equivalent as the new vehicle to be procured.		

California Air Resources Board
Calculator Tool for the
California State Transportation Agency
Transit and Intercity Rail Capital Program
Greenhouse Gas Reduction Fund
Fiscal Year 2018-19

Cap and Trade Dollars at Work

Project Name:	Dublin/Pleasanton Capacity Improvement Program

Input	Description	Quantified Component 5	
Identifying Descriptor (ID)	Brief description of the quantifiable component identifying it from other separable components.		
Funding Inputs			
TIRCP Funds Requested	Total TIRCP funds requested for this separable component.		
Multi-Year	Will this component request several California Transportation Commission allocations over multiple calendar years?		
Additional CCI Program 1			
CCI Program	Other CCI Program from which project has or will be requesting GGRF funds.		
Additional GGRF Funds	Total GGRF funds requested or to be requested from Additional CCI Program 1.		
Additional CCI Program 2			
CCI Program	Other CCI Program from which project has or will be requesting GGRF funds.		
Additional GGRF Funds	Total GGRF funds requested or to be requested from Additional CCI Program 2.		
Total GGRF Funds Requested	Total GGRF funds requested from all CCI Programs		
Project Inputs			
Project Type	For the purposes of this quantification, eligible TIRCP projects fall into four project types. Select the project type that best describes this component.		
Service Type	The transit service (e.g., Intercity/Express Bus (Long Distance), Light Rail, Vanpool, etc.) directly associated with the proposed project. For projects that serve multiple services, select Multi-modal.		
Vehicle Type	The vehicle type (e.g., Transit Bus, Streetcar, Ferry, etc.) that will operate the new service or will be procured.		
Region	The region that best encompasses the geographic location for the proposed project type.		
Sub region	The County or Air Basin where the majority of the service occurs.		
Year 1 (Yr1)	The first year of service or the first year the facility or rolling stock will be in use.		
Year F (YrF)	The final year of service or the final year the facility or rolling stock's useful life.		
Useful Life	The number of years the service is funded or the useful life of the facility or rolling stock.		
Displaced Autos Inputs		**Input**	**Reference**
Yr1 Ridership	The increase in unlinked passenger trips directly associated with the proposed project in the first year (Yr1).		
YrF Ridership	The increase in unlinked passenger trips directly associated with the proposed project in the final year. If the ridership is not expected to change, Yr1 and YrF should be the same value.		
Adjustment Factor (A)	Discount factor applied to annual ridership to account for transit-dependent riders. Use: document project-specific data or system average developed from a recent, statistically valid survey or default.		
Length of Average Trip (L)	Annual passenger miles over unlinked trips directly associated with the proposed project.		
New/Expanded Service Vehicle Inputs		**Input**	**Reference**
Hybrid Vehicle	Is the vehicle for the new/expanded service, or vehicle(s) to be procured, a hybrid?		
Fuel Type	The fuel type (e.g., electric, diesel, etc.) of the vehicle for the new/expanded service, or of the new vehicle(s) to be procured.		
Model Year	The engine model year of the vehicle that will operate the new/expanded service, or of the new vehicle(s) to be procured.		

Project-Specific Emission Factor	If used, applicant must be able to demonstrate an approved carbon intensity value under the Low Carbon Fuel Standard and submit additional documentation.		
Annual VMT	The estimated annual VMT required to operate the new/expanded service or of the new vehicle(s) to be procured (e.g., 72,000). For rail and ferry vehicles, applicants may alternatively use Annual Fuel.		
Annual Fuel	The estimated annual fuel (i.e., gallon of diesel, KWh of electricity) required to operate the new/expanded service, or of the new rail or ferry vehicle(s) to be procured (e.g., 26,000).		
Displaced Vehicle/Fuel Reductions Inputs		**Input**	**Reference**
Fuel Type	The fuel type (e.g., electric, diesel, etc.) of the displaced vehicle(s) or of fuel reductions as a result of the project.		
Model Year	The average engine model year(s) of the displaced vehicle(s) or of the vehicle(s) to realize fuel reductions as a result of the project.		
Annual VMT	The estimated annual VMT of the displaced vehicle(s). For rail and ferry vehicles, applicants may alternatively use Annual Fuel.		
Annual Fuel	The estimated annual fuel reductions expected to be realized as a result of the project or the estimated annual fuel the displaced vehicle(s) would have required to operate the equivalent as the new vehicle to be procured.		

California Air Resources Board
Calculator Tool for the
California State Transportation Agency
Transit and Intercity Rail Capital Program
Greenhouse Gas Reduction Fund
Fiscal Year 2018-19

Project Name:	Dublin/Pleasanton Capacity Improvement Program

Input	Description	Quantified Component 6	
Identifying Descriptor (ID)	Brief description of the quantifiable component identifying it from other separable components.		
Funding Inputs			
TIRCP Funds Requested	Total TIRCP funds requested for this separable component.		
Multi-Year	Will this component request several California Transportation Commission allocations over multiple calendar years?		
Additional CCI Program 1			
CCI Program	Other CCI Program from which project has or will be requesting GGRF funds.		
Additional GGRF Funds	Total GGRF funds requested or to be requested from Additional CCI Program 1.		
Additional CCI Program 2			
CCI Program	Other CCI Program from which project has or will be requesting GGRF funds.		
Additional GGRF Funds	Total GGRF funds requested or to be requested from Additional CCI Program 2.		
Total GGRF Funds Requested	Total GGRF funds requested from all CCI Programs		
Project Inputs			
Project Type	For the purposes of this quantification, eligible TIRCP projects fall into four project types. Select the project type that best describes this component.		
Service Type	The transit service (e.g., Intercity/Express Bus (Long Distance), Light Rail, Vanpool, etc.) directly associated with the proposed project. For projects that serve multiple services, select Multi-modal.		
Vehicle Type	The vehicle type (e.g., Transit Bus, Streetcar, Ferry, etc.) that will operate the new service or will be procured.		
Region	The region that best encompasses the geographic location for the proposed project type.		
Sub region	The County or Air Basin where the majority of the service occurs.		
Year 1 (Yr1)	The first year of service or the first year the facility or rolling stock will be in use.		
Year F (YrF)	The final year of service or the final year the facility or rolling stock's useful life.		
Useful Life	The number of years the service is funded or the useful life of the facility or rolling stock.		
Displaced Autos Inputs		**Input**	**Reference**
Yr1 Ridership	The increase in unlinked passenger trips directly associated with the proposed project in the first year (Yr1).		
YrF Ridership	The increase in unlinked passenger trips directly associated with the proposed project in the final year. If the ridership is not expected to change, Yr1 and YrF should be the same value.		
Adjustment Factor (A)	Discount factor applied to annual ridership to account for transit-dependent riders. Use: document project-specific data or system average developed from a recent, statistically valid survey or default.		
Length of Average Trip (L)	Annual passenger miles over unlinked trips directly associated with the proposed project.		
New/Expanded Service Vehicle Inputs		**Input**	**Reference**
Hybrid Vehicle	Is the vehicle for the new/expanded service, or vehicle(s) to be procured, a hybrid?		
Fuel Type	The fuel type (e.g., electric, diesel, etc.) of the vehicle for the new/expanded service, or of the new vehicle(s) to be procured.		
Model Year	The engine model year of the vehicle that will operate the new/expanded service, or of the new vehicle(s) to be procured.		

Project-Specific Emission Factor	If used, applicant must be able to demonstrate an approved carbon intensity value under the Low Carbon Fuel Standard and submit additional documentation.		
Annual VMT	The estimated annual VMT required to operate the new/expanded service or of the new vehicle(s) to be procured (e.g., 72,000). For rail and ferry vehicles, applicants may alternatively use Annual Fuel.		
Annual Fuel	The estimated annual fuel (i.e., gallon of diesel, KWh of electricity) required to operate the new/expanded service, or of the new rail or ferry vehicle(s) to be procured (e.g., 26,000).		
Displaced Vehicle/Fuel Reductions Inputs		**Input**	**Reference**
Fuel Type	The fuel type (e.g., electric, diesel, etc.) of the displaced vehicle(s) or of fuel reductions as a result of the project.		
Model Year	The average engine model year(s) of the displaced vehicle(s) or of the vehicle(s) to realize fuel reductions as a result of the project.		
Annual VMT	The estimated annual VMT of the displaced vehicle(s). For rail and ferry vehicles, applicants may alternatively use Annual Fuel.		
Annual Fuel	The estimated annual fuel reductions expected to be realized as a result of the project or the estimated annual fuel the displaced vehicle(s) would have required to operate the equivalent as the new vehicle to be procured.		

California Air Resources Board
Calculator Tool for the
California State Transportation Agency
Transit and Intercity Rail Capital Program
Greenhouse Gas Reduction Fund
Fiscal Year 2018-19

Project Name:	Dublin/Pleasanton Capacity Improvement Program

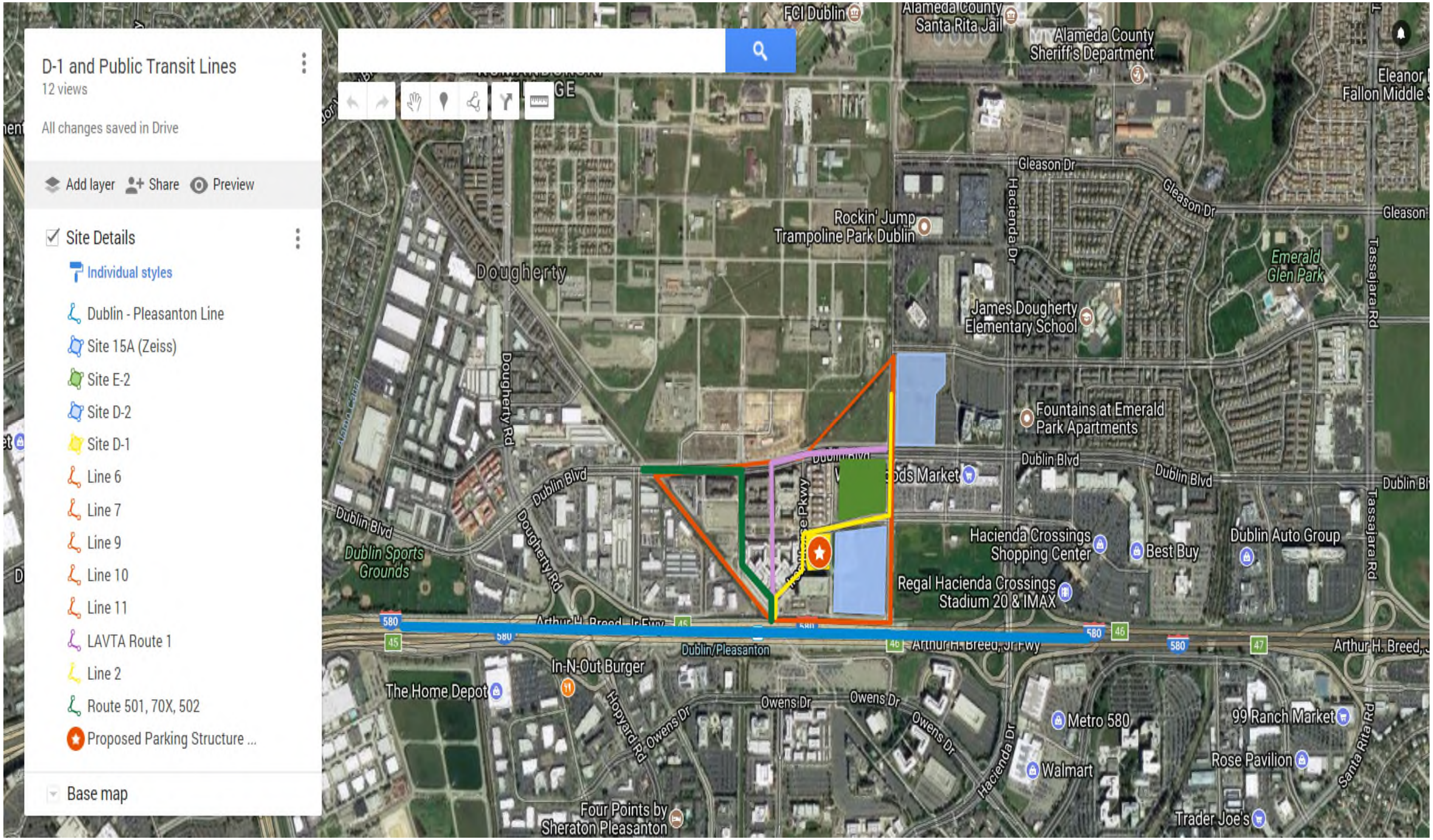
	Quantified GHG Component 1	Quantified GHG Component 2	Quantified GHG Component 3	Quantified GHG Component 4	Quantified GHG Component 5	Quantified GHG Component 6	Total Project
Identifying Descriptor	Increased Ridership						
GHG Emission Reduction Start Date (Year)	2020						
Total CCI							
Total GHG Emission Reductions ($MTCO_2e$)	59						59
Total GGRF Funds Requested ($)	20,000,000						20,000,000
Total GHG Emission Reductions/Total GGRF Funds Requested ($MTCO_2e$/$)	0.000003						0.000003
TIRCP							
TIRCP GHG Emission Reductions ($MTCO_2e$)	59						59
TIRCP Funds Requested ($)	20,000,000						20,000,000
TIRCP GHG Emission Reductions/TIRCP Funds Requested ($MTCO_2e$/$)	0.000003						0.000003
TIRCP Funds Requested/TIRCP GHG Emission Reductions ($/$MTCO_2e$)	337,095						337,095
Additional CCI Program 1							
CCI Program							
GHG Emission Reductions Attributable to other GGRF Programs (MTCO2e)							
Total Additional GGRF Funds to Implement Project ($)							
Additional CCI Program 2							
CCI Program							
GHG Emission Reductions Attributable to other GGRF Programs (MTCO2e)							
Total Additional GGRF Funds to Implement Project ($)							

California Air Resources Board
Calculator Tool for the
California State Transportation Agency
Transit and Intercity Rail Capital Program
Greenhouse Gas Reduction Fund
Fiscal Year 2018-19

Project Name:	Dublin/Pleasanton Capacity Improvement Program

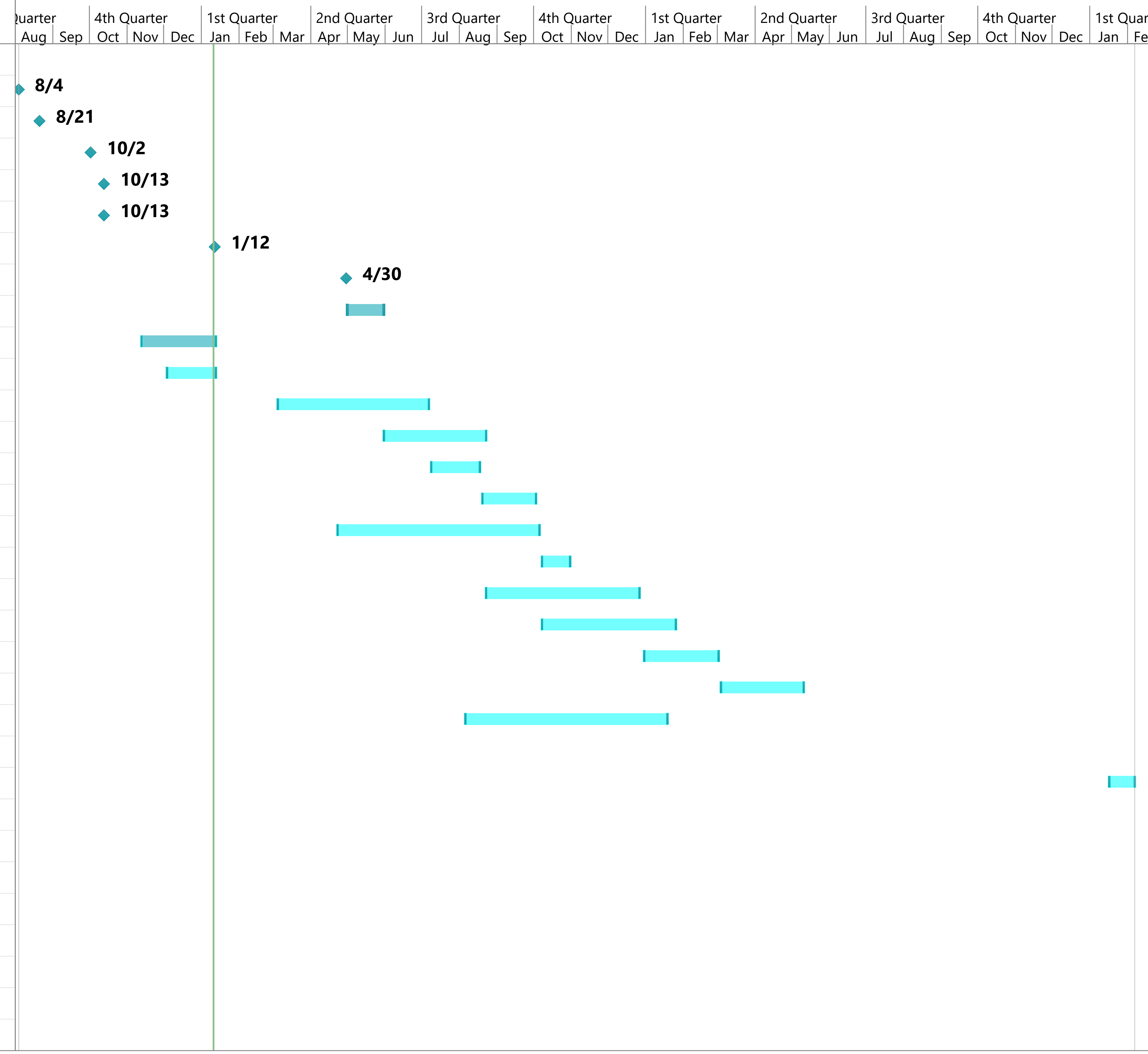
		Quantified Co-Benefit Component 1	Quantified Co-Benefit Component 2	Quantified Co-Benefit Component 3	Quantified Co-Benefit Component 4	Quantified Co-Benefit Component 5	Quantified Co-Benefit Component 6	Total Project
	Identifying Descriptor	Increased Ridership						
	Total CCI							
Key Variables	Passenger VMT Reductions (miles)	3,866						3,866
Key Variables	Fossil Fuel Use Reductions	N/A						
Key Variables	Fossil Fuel Energy Use Reductions (kWh)	N/A						
Co-Benefits	ROG Emission Reductions (lbs)	4						4
Co-Benefits	NOx Emission Reductions (lbs)	19						19
Co-Benefits	PM2.5 Emission Reductions (lbs)	0						0
Co-Benefits	Diesel PM Emission Reductions (lbs)	3						3
	TIRCP							
Key Variables	Passenger VMT Reductions (miles)	3,866						3,866
Key Variables	Fossil Fuel Use Reductions	N/A						
Key Variables	Fossil Fuel Energy Use Reductions (kWh)	N/A						
Co-Benefits	ROG Emission Reductions (lbs)	4						4
Co-Benefits	NOx Emission Reductions (lbs)	19						19
Co-Benefits	PM2.5 Emission Reductions (lbs)	0						0
Co-Benefits	Diesel PM Emission Reductions (lbs)	3						3
	Additional CCI Program 1							
Key Variables	Passenger VMT Reductions (miles)							
Key Variables	Fossil Fuel Use Reductions							
Key Variables	Fossil Fuel Energy Use Reductions (kWh)							
Co-Benefits	ROG Emission Reductions (lbs)							
Co-Benefits	NOx Emission Reductions (lbs)							
Co-Benefits	PM2.5 Emission Reductions (lbs)							
Co-Benefits	Diesel PM Emission Reductions (lbs)							
	Additional CCI Program 2							
Key Variables	Passenger VMT Reductions (miles)							
Key Variables	Fossil Fuel Use Reductions							
Key Variables	Fossil Fuel Energy Use Reductions (kWh)							
Co-Benefits	ROG Emission Reductions (lbs)							
Co-Benefits	NOx Emission Reductions (lbs)							
Co-Benefits	PM2.5 Emission Reductions (lbs)							
Co-Benefits	Diesel PM Emission Reductions (lbs)							

Attachment 2: Depiction of Attached KML File
Dublin/Pleasanton Capacity Improvement & Congestion Reduction Program



Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program
Attachment 3 - Project Schedule - Tasks, Milestones & Deliverables

ID	Task Mode	Task Name	Duration	Start	Finish
1		Dublin Parking Structure - 2018 Transit and Intercity Rail			
2		Draft Guidelines Distribution	0 days	Fri 8/4/17	Fri 8/4/17
3		Informal Workshop N. Calif	0 days	Mon 8/21/17	Mon 8/21/17
4		Worshop N. Calif	0 days	Mon 10/2/17	Mon 10/2/17
5		CalSTA publishes Final Progam Guidelines	0 days	Fri 10/13/17	Fri 10/13/17
6		Call for Projects	0 days	Fri 10/13/17	Fri 10/13/17
7		**Project application due**	0 days	Fri 1/12/18	Fri 1/12/18
8		CalSTA publishes list of approved projects	0 days	Mon 4/30/18	Mon 4/30/18
9		Presentation of Approved Projects to CTC	22 days	Tue 5/1/18	Wed 5/30/18
10		Program Definition - size/intent	45 days	Mon 11/13/17	Fri 1/12/18
11		Budget Estimates	30 days	Mon 12/4/17	Fri 1/12/18
12		Phase 1 -Award & Design/ Utilities/ Demo Contract	90 days	Mon 3/5/18	Fri 7/6/18
13		Phase 2 RFQ/RFP Design/Build Bridging Contract-Garage	60 days	Thu 5/31/18	Wed 8/22/18
14		Phase 1 - BOS Approval Bidding Utilities Demo	30 days	Mon 7/9/18	Fri 8/17/18
15		Phase 1 - Bidding & Award Util/Demo	32 days	Mon 8/20/18	Tue 10/2/18
16		Utilities PG&E Coodination	120 days	Mon 4/23/18	Fri 10/5/18
17		**Phase 1 -Demo Ground Breaking**	17 days	Mon 10/8/18	Tue 10/30/18
18		Phase 2 - D/B Bridging Doc.	90 days	Thu 8/23/18	Wed 12/26/18
19		Phase 1 - Complete Util/Demo	80 days	Mon 10/8/18	Fri 1/25/19
20		Phase 2 - BOS Approves RFQ/RFP D/B Contractor	45 days	Mon 12/31/18	Fri 3/1/19
21		Phase 2 D/B Construction Bidding & Award	50 days	Mon 3/4/19	Fri 5/10/19
22		EIR/CEQA/Negative Declaration	120 days	Mon 8/6/18	Fri 1/18/19
23		Design Build Construction	180 days	Mon 5/13/19	Fri 1/17/20
24		BOS Accepts Occupancy / Completion	15 days	Fri 1/17/20	Thu 2/6/20
25					
26					
27					
28					
29					
30					
31					
32					



Project: Project1-R1
Date: Thu 1/11/18

Task	Project Summary	Manual Task	Start-only	Deadline
Split	Inactive Task	Duration-only	Finish-only	Progress
Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress
Summary	Inactive Summary	Manual Summary	External Milestone	

STATE OF CALIFORNIA ● DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST

DTP-0001 (Revised July 2013)

General Instructions

☑ New Project				Date:	1/12/18
District	**EA**	**Project ID**	**PPNO**	**MPO ID**	
01					

County	Route/Corridor	PM Bk	PM Ahd	Project Sponsor/Lead Agency	
ALA	580			California State Transportaton Agency	
				MPO	**Element**
				MTC	Local Assistance

Project Manager/Contact	Phone	E-mail Address
Kenneth Wong	510-208-9515	kenneth.wong2@acgov.org

Project Title

Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program

Location, Project Limits, Description, Scope of Work ☐ See page 2

The Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program will be spearheaded by Alameda County GSA. GSA will plan and manage the construction process, own, and operate the garage upon completion. The County will utilize a 2-Phase Design-Build project delivery system in order to complete the proposed parking structure at the D-1 site, a 2.46 acre parcel of Alameda County-owned land that is adjacent to the Dublin/Pleasanton BART station and on the I-580 corridor. Total project costs are calculated at $34 million - $20 million from TIRCP funding and $14 million in leveraged MTC & ATC

☑ GHG Reductions ☑ Integrated Service ☑ Increase Ridership

Component	Implementing Agency
PA&ED	LAVTA/County of Alameda
PS&E	LAVTA/County of Alameda
Right of Way	LAVTA/County of Alameda, PG&E
Construction	LAVTA/County of Alameda

Purpose and Need ☐ See page 2

The Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program is a critical infrastructure development program that will significantly reduce congestion in a high-traffic area, increase ridership to a number of Bay Area transit agencies, and further reduce Greenhouse Gas (GHG) emissions throughout the area. In partnership, LAVTA and GSA will develop a multi-level parking structure that will accommodate nearly 500 transit riders daily and will include electric vehicle charging stations and preferred parking to vanpools to further maximize utilization. This structure will facilitate commuters, a significant portion of which come to this transit center from disadvantaged communities.

Project Benefits ☐ See page 2

The multi-level convertible parking structure will accommodate 537 spaces at maximum, adding much-needed parking in this congested transit center that facilitates commuters seeking to utilize transit to six local and regional transit lines, the collective daily ridership of which is in the tens of thousands. Project benefits are: increased ridership, further integration of mulitple transit lines, and reduced congestion.

☑ Supports Sustainable Communities Strategy (SCS) Goals ☑ Disadvantaged Communities

Project Milestone			Proposed
Project Study Report Approved			**05/31/18**
Begin Environmental (PA&ED) Phase			08/06/18
Circulate Draft Environmental Document	**Document Type**	EIR	10/15/18
Draft Project Report			07/06/18
End Environmental Phase (PA&ED Milestone)			12/17/18
Begin Design (PS&E) Phase			04/29/18
End Design Phase (Ready to List for Advertisement Milestone)			08/30/18
Begin Right of Way Phase			07/06/18
End Right of Way Phase (Right of Way Certification Milestone)			01/04/19
Begin Construction Phase (Contract Award Milestone)			01/15/19
End Construction Phase (Construction Contract Acceptance Milestone)			12/21/19
Begin Closeout Phase			12/21/19
End Closeout Phase (Closeout Report)			02/06/20

STATE OF CALIFORNIA ● DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST

DTP-0001 (Revised July 2013)

Date: 1/12/18

District	County	Route	EA	Project ID	PPNO	
1	Alameda	580				
Project Title:	Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program					

Proposed Total Project Cost ($1,000s)									Notes
Component	Prior	14/15	15/16	16/17	17/18	18/19	19/20+	Total	
E&P (PA&ED)						300	300	600	
PS&E						1,000	1,600	2,600	The project will utilize a 2-Phase Design-Build (D/B) delivery method. The D/B design for demolition and utilities will start in April 2018. The D/B parking structure design will start in August, 2018.
R/W SUP (CT)									
CON SUP (CT)									
R/W						200	200	400	
CON						1,400	29,000	30,400	
TOTAL						2,900	31,100	34,000	

Fund No. 1:	**2018 Transit & Intercity Rail Capital Program (TIRCP) $20 million**								**Program Code**
Proposed Funding ($1,000s)									
Component	Prior	14/15	15/16	16/17	17/18	18/19	19/20+	Total	**Funding Agency**
E&P (PA&ED)						200	200	400	Alameda County
PS&E						600	1,000	1,600	
R/W SUP (CT)									
CON SUP (CT)									
R/W						100	100	200	
CON						800	17,000	17,800	
TOTAL						1,700	18,300	20,000	

Fund No. 2:	**Non-TIRCP Fund from MTC/ACTC $14 million**								**Program Code**
Proposed Funding ($1,000s)									
Component	Prior	14/15	15/16	16/17	17/18	18/19	19/20+	Total	**Funding Agency**
E&P (PA&ED)						100	100	200	Alameda County
PS&E						400	600	1,000	
R/W SUP (CT)									
CON SUP (CT)									
R/W						100	100	200	
CON						600	12,000	12,600	
TOTAL						1,200	12,800	14,000	

Fund No. 3:									**Program Code**
Proposed Funding ($1,000s)									
Component	Prior	14/15	15/16	16/17	17/18	18/19	19/20+	Total	**Funding Agency**
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									

STATE OF CALIFORNIA ● DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST

DTP-0001 (Revised July 2013)

Date: 1/12/18

District	County	Route	EA	Project ID	PPNO	
1	Alameda	580				
Project Title:	Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program					

Fund No. 4:									**Program Code**
	Proposed Funding ($1,000s)								
Component	Prior	14/15	15/16	16/17	17/18	18/19	19/20+	Total	**Funding Agency**
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									

Fund No. 5:									**Program Code**
	Proposed Funding ($1,000s)								
Component	Prior	14/15	15/16	16/17	17/18	18/19	19/20+	Total	**Funding Agency**
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									

Fund No. 6:									**Program Code**
	Proposed Funding ($1,000s)								
Component	Prior	14/15	15/16	16/17	17/18	18/19	19/20+	Total	**Funding Agency**
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									

Fund No. 7:									**Program Code**
	Proposed Funding ($1,000s)								
Component	Prior	14/15	15/16	16/17	17/18	18/19	19/20+	Total	**Funding Agency**
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									

STATE OF CALIFORNIA ● DEPARTMENT OF TRANSPORTATION

PROJECT PROGRAMMING REQUEST

DTP-0001 (Revised July 2013)

Date: 1/12/18

District	County	Route	EA	Project ID	PPNO	
1	Alameda	580				
Project Title:	Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program					

Fund No. 8:									**Program Code**
	Proposed Funding ($1,000s)								
Component	Prior	14/15	15/16	16/17	17/18	18/19	19/20+	Total	**Funding Agency**
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									

Fund No. 9:									**Program Code**
	Proposed Funding ($1,000s)								
Component	Prior	14/15	15/16	16/17	17/18	18/19	19/20+	Total	**Funding Agency**
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									

Fund No. 10:									**Program Code**
	Proposed Funding ($1,000s)								
Component	Prior	14/15	15/16	16/17	17/18	18/19	19/20+	Total	**Funding Agency**
E&P (PA&ED)									
PS&E									
R/W SUP (CT)									
CON SUP (CT)									
R/W									
CON									
TOTAL									

WILLIE A. HOPKINS, JR., Director

1401 LAKESIDE DRIVE, OAKLAND, CALIFORNIA 94612 510 208 9700 FAX 510 208 9711 WWW.ACGOV.ORG/GSA/

January 12, 2018

Ezequiel Castro, Acting Chief Division of Rail and Mass Transportation
Office of State Transit Programs and Plans (MS 39)
P.O. Box 942874
Sacramento, CA 94274-0001

Dear Mr. Castro:

I certify the cost estimates for the proposed project to advance the Dublin/Pleasanton BART Capacity Improvement and Congestion Reduction Program.

Respectfully,

Willie A. Hopkins, Jr
County of Alameda
Director, General Services Agency

WAH:clw

WILLIE A. HOPKINS, JR., Director

1401 LAKESIDE DRIVE, OAKLAND, CALIFORNIA 94612 510 208 9700 FAX 510 208 9711 WWW.ACGOV.ORG/GSA/

January 11, 2018

Ezequiel Castro, Acting Chief Division of Rail and Mass Transportation
Office of State Transit Programs and Plans (MS 39)
P.O. Box 942874
Sacramento, CA 94274-0001

Dear Mr. Castro:

The General Services Agency of Alameda County, in partnership with the Livermore Amador Valley Transit Authority (LAVTA), is submitting an application to the Transit Intercity Rail Capital Rail Program (TIRCP) to advance the Dublin/Pleasanton BART Capacity Improvement and Congestion Reduction Program.

Alameda County's Board of Supervisors has a clear vision of how to make this county one of the best places in the country to live, work, and do business by providing strong leadership and adopting visionary policies for climate protection. Environmental sustainability is an integral part of that vision. The actions we take provide many benefits to our communities. This project's primary focus of reducing greenhouse gas emissions and preserving resources for current and future generations aligns with our Board's visionary policies while enhancing The Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program. This project is a future-thinking project by design and will incorporate new and still-developing technology to reduce greenhouse gas emissions.

Our application seeks funds to build a new parking garage adjacent to the Dublin-Pleasanton BART station with a capacity of more than 500 new parking spaces for commuters. Alameda County believes the additional parking development will address a significant regional need for additional parking capacity at this location. The majority of commuters using the Dublin-Pleasanton BART Station access the station by car, making adequate parking a necessity. Additionally, thousands of people are on the waiting list for reserved BART parking spaces. Alameda County will benefit greatly from improved parking capacity at the Dublin-Pleasanton BART Station. It will allow more commuters to utilize the BART system, improving congestion and air quality, and will alleviate congestion on local city streets and roads.

The General Services Agency of Alameda County strongly supports this proposed project and will assume the responsibility of project management and construction. If you have any questions or comments on this letter of support, please feel free to contact me at 510-208-9700.

Respectfully,

Willie A. Hopkins, Jr
County of Alameda
Director, General Services Agency

WAH:clw

BOARD OF SUPERVISORS

SCOTT HAGGERTY
SUPERVISOR, FIRST DISTRICT

January 11, 2018

Mr. Ezequiel Castro, Acting Chief
Division of Rail and Mass Transportation
Office of State Transit Programs and Plans (MS 39) P.O. Box 942874
Sacramento, CA 94274-0001

Re: Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program

Dear Mr. Castro,

I write to express full support for the Transit Intercity Rail Capital Rail Program (TIRCP) application to advance the Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program. The proposal seeks to advance critical infrastructure to address the significant regional need for additional access to the Dublin/Pleasanton BART station. It will advance a 500+ space state-of-the art parking garage that will serve to boost BART ridership and alleviate congestion on local city streets and roads. It is a vital component of the Dublin Transit Village Plan, a station area plan developed in partnership with the City of Dublin, BART and Alameda County. This adopted and environmentally cleared plan, supports our region's smart growth and contributes overall to the region's quality of life and environment.

Thank you for your consideration of this important proposal.

Sincerely,

Scott Haggerty

Scott Haggerty
Alameda County Supervisor, First District

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DUBLIN
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THE NEW AMERICAN BACKYARD

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925.833.6650
City Manager
925.833.6650
Community Development
925.833.6610
Economic Development
925.833.6650
Finance/IT
925.833.6640
Fire Prevention
925.833.6606
Human Resources
925.833.6605
Parks & Community Services
925.833.6645
Police
925.833.6670
Public Works
925.833.6630

100 Civic Plaza
Dublin, CA 94568
P 925.833.6650
F 925.833.6651
www.dublin.ca.gov

January 11, 2018

Ezequiel Castro
Acting Chief Division of Rail and Mass Transportation
Office of State Transit Programs and Plans (MS 39)
P.O. Box 942874
Sacramento, CA 94274-001

Subject: ***Letter of Support – Transit Intercity Rail Capital Rail Program Application: Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program***

Dear Mr. Castro:

It is our understanding that the Livermore Amador Valley Transit Authority (LAVTA), in partnership with Alameda County, is submitting an application to the Transit Intercity Rail Capital Rail Program (TIRCP) to advance the Dublin/Pleasanton BART Capacity Improvement and Congestion Reduction Program. The Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program is a critical infrastructure development program that will address a significant regional need for additional parking capacity at the Dublin-Pleasanton BART station. The application seeks funds to build a new parking garage adjacent to the Dublin-Pleasanton BART station with more than 500 new parking spaces for commuters.

Currently, parking at Dublin-Pleasanton BART fills up by 7:30am, leaving commuters who are trying to access the station with no choice but to drive to their final destination, or search for unauthorized parking in the City of Dublin. The majority of commuters using the Dublin-Pleasanton BART Station access the station by car, making adequate parking a necessity. Additionally, thousands of people are on the waiting list for reserved BART parking spaces. The project is a future-thinking project by design and will incorporate new and still-developing technology to reduce GHG emissions.

The City of Dublin will benefit greatly from improved parking capacity at the Dublin-Pleasanton BART Station. It will allow more commuters to utilize the BART system, improving congestion and air quality, and will alleviate congestion on local city streets and roads.

The City of Dublin strongly supports this proposed project. If you have any questions or comments on this letter of support, please feel free to contact me at david.haubert@dublin.ca.gov or 925-833-6650.

Sincerely,

David G. Haubert

David G. Haubert
Mayor

ERIC SWALWELL
15TH DISTRICT, CALIFORNIA
CO-CHAIR, DEMOCRATIC STEERING AND POLICY COMMITTEE
CHAIR, FUTURE FORUM
3615 CASTRO VALLEY BLVD.
CASTRO VALLEY, CA 94546
(510) 370–3322
129 CANNON HOUSE OFFICE BUILDING
WASHINGTON, DC 20515
(202) 225–5065
swalwell.house.gov

Congress of the United States
House of Representatives
Washington, DC 20515

PERMANENT SELECT COMMITTEE ON INTELLIGENCE
RANKING MEMBER, SUBCOMMITTEE ON CIA
SUBCOMMITTEE ON EMERGING THREATS
COMMITTEE ON JUDICIARY
SUBCOMMITTEE ON COURTS, INTELLECTUAL PROPERTY, AND THE INTERNET
SUBCOMMITTEE ON REGULATORY REFORM, COMMERCIAL AND ANTITRUST LAW

January 12, 2018

Ezequiel Castro, Acting Chief
Division of Rail and Mass Transportation
Office of State Transit Programs and Plans (MS 39)
P.O. Box 942874
Sacramento, CA 94274-0001

Re: Support for Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program

Dear Mr. Castro:

I am writing in support of the application to the Transit Intercity Capital Rail Program (TIRCP) to advance the Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program, submitted by the Livermore Amador Valley Transit Authority (LAVTA) and the County of Alameda.

My office has been informed that the proposal seeks to advance critical infrastructure to address a significant regional need for additional parking capacity at the Dublin/Pleasanton Bay Area Rapid Transit (BART) station. The application seeks funds to build a new parking garage adjacent to the Dublin/Pleasanton BART station with more than 500 new parking spaces for commuters, and it is my understanding that this will serve to increase commuter utilization of BART and alleviate congestion on local city streets and roads. Additionally, the project seeks to improve the region's overall quality of life and environmental concerns through the increased parking capacity.

I respectfully request that the TIRCP give favorable consideration to the Dublin/Pleasanton Capacity Improvement and Congestion Reduction program application in accordance with all applicable laws and regulations.

Sincerely,

Eric Swalwell

Eric Swalwell
Member of Congress

innovation tri-valley
leadership group
Danville • Dublin • Livermore • Pleasanton • San Ramon

5960 Inglewood Drive, #201
Pleasanton, CA 94588
818.395.0742
www.innovationtrivalley.org

January 12, 2018

Ezequiel Castro
Acting Chief Division of Rail and Mass Transportation
Office of State Transit Programs and Plans (MS 39)
P.O. Box 942874 Sacramento, CA 94274-001

Subject: Letter of Support – Transit Intercity Rail Capital Rail Program Application: Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program

Dear Mr. Castro:

Innovation Tri-Valley Leadership Group is a collaboration of leaders and influencers committed to connecting the businesses, education institution, research labs and civic leaders in the Tri-Valley. This collaborative force is generating job growth and economic vitality for a region that is globally connected, regionally united and locally unique.

It is our understanding that the Livermore Amador Valley Transit Authority (LAVTA), in partnership with Alameda County, is submitting an application to the Transit Intercity Rail Capital Rail Program (TIRCP) to advance the Dublin/Pleasanton BART Capacity Improvement and Congestion Reduction Program. The Dublin/Pleasanton Capacity Improvement and Congestion Reduction Program is a critical infrastructure development program that will address a significant regional need for additional parking capacity at the Dublin-Pleasanton BART station. The application seeks funds to build a new parking garage adjacent to the Dublin-Pleasanton BART station with more than 500 new parking spaces for commuters.

Currently, parking at Dublin-Pleasanton BART fills up by 7:30am, leaving commuters who are trying to access the station with no choice but to drive to their final destination, or search for unauthorized parking in the City of Dublin. The majority of commuters using the Dublin-Pleasanton BART Station access the station by car, making adequate parking a necessity. Additionally, thousands of people are on the waiting list for reserved BART parking spaces. The project is a future-thinking project by design and will incorporate new and still-developing technology to reduce GHG emissions and l allow more commuters to utilize the BART system, improving congestion and air quality, and will alleviate congestion on local city streets and roads.

The board of directors for Innovation Tri-Valley ask that the TIRCP give favorable consideration to the Dublin/Pleasanton Capacity Improvement and Reduction program allocation in accordance with all applicable laws and regulations.

Sincerely,

Dale Eldridge Kaye

Dale Kaye
President/CEO
Innovation Tri-Valley Leadership Group

Appendix B:

CalEEMod Report: Construction Emissions

GSA Garage Project

Alameda County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unenclosed Parking with Elevator	570.00	Space	1.20	170,000.00	0

1.2 Other Project Characteristics

Urbanization Urban **Wind Speed (m/s)** 2.2 **Precipitation Freq (Days)** 63

Climate Zone 4 **Operational Year** 2020

Utility Company Pacific Gas & Electric Company

CO2 Intensity (lb/MWhr) 641.35 **CH4 Intensity (lb/MWhr)** 0.029 **N2O Intensity (lb/MWhr)** 0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - acreage and square footage per plans

Construction Phase -

Table Name	Column Name	Default Value	New Value
tblLandUse	LandUseSquareFeet	228,000.00	170,000.00
tblLandUse	LotAcreage	5.13	1.20

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.6984	22.7162	16.4758		5.8653	1.2870	6.7481	2.9711	1.2024	3.7833						3,401.7432
2020	7.3872	18.2728	15.8656		0.7730	0.8153	1.5882	0.2093	0.7872	0.9965						3,361.0674
Maximum	**7.3872**	**22.7162**	**16.4758**		**5.8653**	**1.2870**	**6.7481**	**2.9711**	**1.2024**	**3.7833**						**3,401.7432**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	2.6984	22.7162	16.4758		5.8653	1.2870	6.7481	2.9711	1.2024	3.7833						3,401.7432
2020	7.3872	18.2728	15.8656		0.7730	0.8153	1.5882	0.2093	0.7872	0.9965						3,361.0674

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N20	CO2e
Maximum	**7.3872**	**22.7162**	**16.4758**		**5.8653**	**1.2870**	**6.7481**	**2.9711**	**1.2024**	**3.7833**						**3,401.7432**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	10/1/2019	10/28/2019	5	20	
2	Site Preparation	Site Preparation	10/29/2019	10/30/2019	5	2	
3	Grading	Grading	10/31/2019	11/5/2019	5	4	
4	Building Construction	Building Construction	11/6/2019	8/11/2020	5	200	
5	Paving	Paving	8/12/2020	8/25/2020	5	10	
6	Architectural Coating	Architectural Coating	8/26/2020	9/8/2020	5	10	

Acres of Grading (Site Preparation Phase): 1

Acres of Grading (Grading Phase): 1.5

Acres of Paving: 1.2

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 10,200

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	6.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Paving	Paving Equipment	1	8.00	132	0.36
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Building Construction	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	5	13.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	71.00	28.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

Paving	5	13.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	14.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2950	22.6751	14.8943			1.2863	1.2863		1.2017	1.2017						2,375.7475
Total	**2.2950**	**22.6751**	**14.8943**			**1.2863**	**1.2863**		**1.2017**	**1.2017**						**2,375.7475**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0543	0.0412	0.3910		0.1068	7.3000e-004	0.1075	0.0283	6.8000e-004	0.0290						103.1972
Total	**0.0543**	**0.0412**	**0.3910**		**0.1068**	**7.3000e-004**	**0.1075**	**0.0283**	**6.8000e-004**	**0.0290**						**103.1972**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2950	22.6751	14.8943			1.2863	1.2863		1.2017	1.2017						2,375.7475
Total	**2.2950**	**22.6751**	**14.8943**			**1.2863**	**1.2863**		**1.2017**	**1.2017**						**2,375.7475**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0543	0.0412	0.3910		0.1068	7.3000e-004	0.1075	0.0283	6.8000e-004	0.0290						103.1972

Total	**0.0543**	**0.0412**	**0.3910**		**0.1068**	**7.3000e-004**	**0.1075**	**0.0283**	**6.8000e-004**	**0.0290**						**103.1972**

3.3 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.7996	0.0000	5.7996	2.9537	0.0000	2.9537						0.0000
Off-Road	1.7123	19.4821	7.8893			0.8824	0.8824		0.8118	0.8118						1,718.4044
Total	**1.7123**	**19.4821**	**7.8893**		**5.7996**	**0.8824**	**6.6819**	**2.9537**	**0.8118**	**3.7655**						**1,718.4044**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0334	0.0253	0.2406		0.0657	4.5000e-004	0.0662	0.0174	4.2000e-004	0.0179						63.5060
Total	**0.0334**	**0.0253**	**0.2406**		**0.0657**	**4.5000e-004**	**0.0662**	**0.0174**	**4.2000e-004**	**0.0179**						**63.5060**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.7996	0.0000	5.7996	2.9537	0.0000	2.9537						0.0000
Off-Road	1.7123	19.4821	7.8893			0.8824	0.8824		0.8118	0.8118						1,718.4044
Total	**1.7123**	**19.4821**	**7.8893**		**5.7996**	**0.8824**	**6.6819**	**2.9537**	**0.8118**	**3.7655**						**1,718.4044**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0334	0.0253	0.2406		0.0657	4.5000e-004	0.0662	0.0174	4.2000e-004	0.0179						63.5060
Total	**0.0334**	**0.0253**	**0.2406**		**0.0657**	**4.5000e-004**	**0.0662**	**0.0174**	**4.2000e-004**	**0.0179**						**63.5060**

3.4 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.9143	0.0000	4.9143	2.5256	0.0000	2.5256						0.0000
Off-Road	1.4197	16.0357	6.6065			0.7365	0.7365		0.6775	0.6775						1,407.4359
Total	**1.4197**	**16.0357**	**6.6065**		**4.9143**	**0.7365**	**5.6507**	**2.5256**	**0.6775**	**3.2032**						**1,407.4359**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0334	0.0253	0.2406		0.0657	4.5000e-004	0.0662	0.0174	4.2000e-004	0.0179						63.5060
Total	**0.0334**	**0.0253**	**0.2406**		**0.0657**	**4.5000e-004**	**0.0662**	**0.0174**	**4.2000e-004**	**0.0179**						**63.5060**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.9143	0.0000	4.9143	2.5256	0.0000	2.5256						0.0000
Off-Road	1.4197	16.0357	6.6065			0.7365	0.7365		0.6775	0.6775						1,407.4359
Total	**1.4197**	**16.0357**	**6.6065**		**4.9143**	**0.7365**	**5.6507**	**2.5256**	**0.6775**	**3.2032**						**1,407.4359**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0334	0.0253	0.2406		0.0657	4.5000e-004	0.0662	0.0174	4.2000e-004	0.0179						63.5060
Total	**0.0334**	**0.0253**	**0.2406**		**0.0657**	**4.5000e-004**	**0.0662**	**0.0174**	**4.2000e-004**	**0.0179**						**63.5060**

3.5 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2721	15.9802	13.4870			0.9158	0.9158		0.8846	0.8846						2,027.721 0
Total	**2.2721**	**15.9802**	**13.4870**			**0.9158**	**0.9158**		**0.8846**	**0.8846**						**2,027.721 0**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.1297	3.5776	0.8535		0.1897	0.0231	0.2128	0.0546	0.0221	0.0767						810.4069
Worker	0.2967	0.2249	2.1352		0.5833	4.0000e-003	0.5873	0.1547	3.6900e-003	0.1584						563.6153
Total	**0.4263**	**3.8025**	**2.9887**		**0.7730**	**0.0271**	**0.8001**	**0.2093**	**0.0258**	**0.2351**						**1,374.022 2**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2721	15.9802	13.4870			0.9158	0.9158		0.8846	0.8846						2,027.721 0
Total	**2.2721**	**15.9802**	**13.4870**			**0.9158**	**0.9158**		**0.8846**	**0.8846**						**2,027.721 0**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.1297	3.5776	0.8535		0.1897	0.0231	0.2128	0.0546	0.0221	0.0767						810.4069
Worker	0.2967	0.2249	2.1352		0.5833	4.0000e-003	0.5873	0.1547	3.6900e-003	0.1584						563.6153
Total	**0.4263**	**3.8025**	**2.9887**		**0.7730**	**0.0271**	**0.8001**	**0.2093**	**0.0258**	**0.2351**						**1,374.022 2**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Off-Road	2.0305	14.7882	13.1881			0.7960	0.7960		0.7688	0.7688						2,010.4467
Total	**2.0305**	**14.7882**	**13.1881**			**0.7960**	**0.7960**		**0.7688**	**0.7688**						**2,010.4467**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.1083	3.2858	0.7650		0.1897	0.0154	0.2051	0.0546	0.0147	0.0694						804.4816
Worker	0.2709	0.1988	1.9125		0.5833	3.8900e-003	0.5871	0.1547	3.5900e-003	0.1583						546.1392
Total	**0.3792**	**3.4846**	**2.6775**		**0.7730**	**0.0193**	**0.7923**	**0.2093**	**0.0183**	**0.2277**						**1,350.6207**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0305	14.7882	13.1881			0.7960	0.7960		0.7688	0.7688						2,010.4467
Total	**2.0305**	**14.7882**	**13.1881**			**0.7960**	**0.7960**		**0.7688**	**0.7688**						**2,010.4467**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.1083	3.2858	0.7650		0.1897	0.0154	0.2051	0.0546	0.0147	0.0694						804.4816
Worker	0.2709	0.1988	1.9125		0.5833	3.8900e-003	0.5871	0.1547	3.5900e-003	0.1583						546.1392
Total	**0.3792**	**3.4846**	**2.6775**		**0.7730**	**0.0193**	**0.7923**	**0.2093**	**0.0183**	**0.2277**						**1,350.6207**

3.6 Paving - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8402	8.4514	8.8758			0.4695	0.4695		0.4328	0.4328						1,307.2246
Paving	0.0000					0.0000	0.0000		0.0000	0.0000						0.0000

Total	0.8402	8.4514	8.8758			0.4695	0.4695		0.4328	0.4328						1,307.2246

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0496	0.0364	0.3502		0.1068	7.1000e-004	0.1075	0.0283	6.6000e-004	0.0290						99.9973
Total	**0.0496**	**0.0364**	**0.3502**		**0.1068**	**7.1000e-004**	**0.1075**	**0.0283**	**6.6000e-004**	**0.0290**						**99.9973**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8402	8.4514	8.8758			0.4695	0.4695		0.4328	0.4328						1,307.2246
Paving	0.0000					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**0.8402**	**8.4514**	**8.8758**			**0.4695**	**0.4695**		**0.4328**	**0.4328**						**1,307.2246**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0496	0.0364	0.3502		0.1068	7.1000e-004	0.1075	0.0283	6.6000e-004	0.0290						99.9973
Total	**0.0496**	**0.0364**	**0.3502**		**0.1068**	**7.1000e-004**	**0.1075**	**0.0283**	**6.6000e-004**	**0.0290**						**99.9973**

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	7.0916					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2422	1.6838	1.8314			0.1109	0.1109		0.1109	0.1109						281.9928
Total	**7.3337**	**1.6838**	**1.8314**			**0.1109**	**0.1109**		**0.1109**	**0.1109**						**281.9928**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0534	0.0392	0.3771		0.1150	7.7000e-004	0.1158	0.0305	7.1000e-004	0.0312						107.6894
Total	**0.0534**	**0.0392**	**0.3771**		**0.1150**	**7.7000e-004**	**0.1158**	**0.0305**	**7.1000e-004**	**0.0312**						**107.6894**

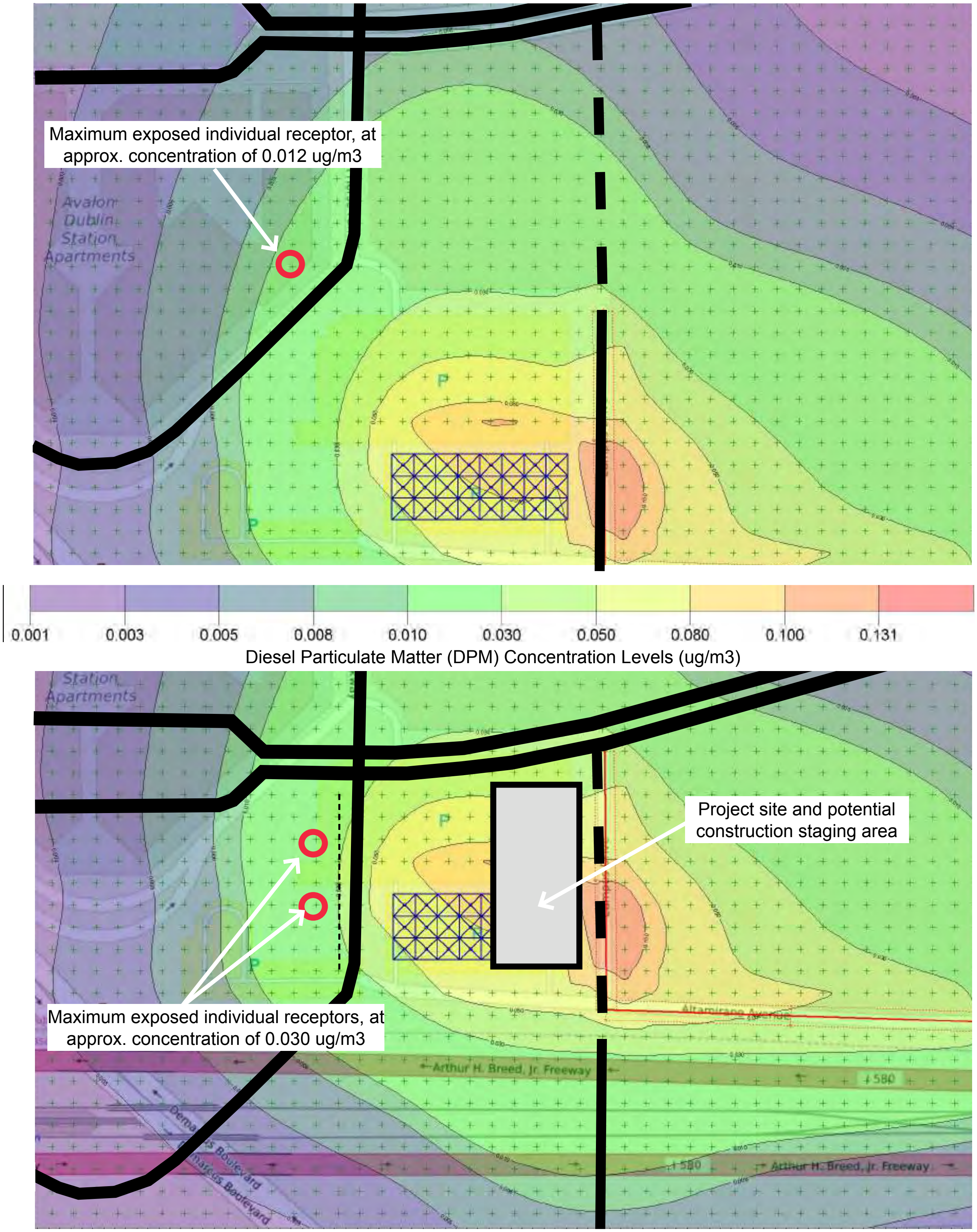
Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	7.0916					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2422	1.6838	1.8314			0.1109	0.1109		0.1109	0.1109						281.9928
Total	**7.3337**	**1.6838**	**1.8314**			**0.1109**	**0.1109**		**0.1109**	**0.1109**						**281.9928**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0534	0.0392	0.3771		0.1150	7.7000e-004	0.1158	0.0305	7.1000e-004	0.0312						107.6894
Total	**0.0534**	**0.0392**	**0.3771**		**0.1150**	**7.7000e-004**	**0.1158**	**0.0305**	**7.1000e-004**	**0.0312**						**107.6894**

AERMOD Construction Emission Concentrations, per BART Addendum to DTC EIR, 2016



AERMOD Construction Emission Concentrations, as Extrapolated for Project

Construction Period DPM Concentration Levels, per BART Addendum and as Extrapolated for Project

Source: 2016 BART Addendum to DTC EIR, Appendix B

Summary of Health Risk Assessment for DPM Emissions during Construction

Health Risk Assessment Parameters and Results				
DPM Emissions without use of diesel particulate filters				
Inhalation Cancer Risk Assessment for DPM	**Units**	**Age Group**		**Notes**
		3rd Trimester	**0-2 Years**	
DPM Concentration (C)	μg/m^3	0.083	0.083	ISCST3 Annual Average
Daily Breathing Rate (DBR)	L/kg-day	361	1090	95th percentile under age of 2 (OEHHA, 2015)
Inhalation absorption factor (A)	unitless	1.0	1.0	OEHHA, 2015
Exposure Frequency (EF)	unitless	0.96	0.96	350 days/365 days in a year (OEHHA, 2015)
Dose Conversion Factor (CF_D)	mg-m^3/μg-L	0.000001	0.000001	Conversion of μg to mg and L to m^3
Dose	mg/kg/day	0.000029	0.000087	C*DBR*A*EF*CF_D (OEHHA, 2015)
Cancer Potency Factor (CPF)	(mg/kg/day)$^{-1}$	1.1	1.1	OEHHA, 2015
Age Sensitivity Factor (ASF)	unitless	10	10	OEHHA, 2015
Annual Exposure Duration (ED)	years	0.25	1.75	Based on total construction period of 2 years
Averaging Time (AT)	years	70	70	70 years for residents (OEHHA, 2015)
Fraction of time at home (FAH)	unitless	0.85	0.85	OEHHA, 2015
Cancer Risk Conversion Factor (CF)	m^3/L	1000000	1000000	Chances per million (OEHHA, 2015)
Cancer Risk	per million	0.96	20.30	At MEIR location
Total Cancer Risk	per million	21.3		At MEIR location
Hazard Index for DPM	**Units**	**Value**	**Notes**	
Chronic REL	μg/m^3	5.0	OEHHA, 2015	
Chronic Hazard Index for DPM	unitless	0.02	At MEIR location	

0.030 to 0.036

DPM Emissions with use of diesel particulate filters				
Inhalation Cancer Risk Assessment for DPM	**Units**	**Age Group**		**Notes**
		3rd Trimester	**0-2 Years**	
DPM Concentration (C)	μg/m^3	0.012	0.012	ISCST3 Annual Average
Daily Breathing Rate (DBR)	L/kg-day	361	1090	95th percentile under age of 2 (OEHHA, 2015)
Inhalation absorption factor (A)	unitless	1.0	1.0	OEHHA, 2015
Exposure Frequency (EF)	unitless	0.96	0.96	350 days/365 days in a year (OEHHA, 2015)
Dose Conversion Factor (CF_D)	mg-m^3/μg-L	0.000001	0.000001	Conversion of μg to mg and L to m^3
Dose	mg/kg/day	0.000004	0.000013	C*DBR*A*EF*CF_D (OEHHA, 2015)
Cancer Potency Factor (CPF)	(mg/kg/day)$^{-1}$	1.1	1.1	OEHHA, 2015
Age Sensitivity Factor (ASF)	unitless	10	10	OEHHA, 2015
Annual Exposure Duration (ED)	years	0.25	1.75	Based on total construction period of 2 years
Averaging Time (AT)	years	70	70	70 years for residents (OEHHA, 2015)
Fraction of time at home (FAH)	unitless	0.85	0.85	OEHHA, 2015
Cancer Risk Conversion Factor (CF)	m^3/L	1000000	1000000	Chances per million (OEHHA, 2015)
Cancer Risk	per million	0.14	2.94	At MEIR location
Total Cancer Risk	per million	3.1		At MEIR location
Hazard Index for DPM	**Units**	**Value**	**Notes**	
Chronic REL	μg/m^3	5.0	OEHHA, 2015	
Chronic Hazard Index for DPM	unitless	0.002	At MEIR location	

9.30

Notes:

DPM = diesel particulate matter

REL = reference exposure level

μg/m^3 = micrograms per cubic meter

L/kg-day = liters per kilogram-day

m^3/L = cubic meters per liter

(mg/kg/day)$^{-1}$ = 1/milligrams per kilograms per day

MEIR = maximum exposed individual resident

Office of Environmental Health Hazard Assessment (OEHHA), 2015. *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments. February.*

Cancer Risks, as Extrapolated from 2016 BART Addendum, Appendix B

Source: BART, Addendum to DCT EIR, 2016

Appendix C:

CalEEMod Report: Operational Emissions

garage

Alameda County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unenclosed Parking with Elevator	570.00	Space	1.20	170,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	63
Climate Zone	4			**Operational Year**	2020
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - acreage and square footage per plans

Construction Phase -

Vehicle Trips - trip reduction

Table Name	Column Name	Default Value	New Value
tblLandUse	LandUseSquareFeet	228,000.00	170,000.00
tblLandUse	LotAcreage	5.13	1.20
tblVehicleTrips	CC_TL	7.30	49.00
tblVehicleTrips	CC_TTP	0.00	100.00
tblVehicleTrips	CNW_TL	7.30	49.00
tblVehicleTrips	CW_TL	9.50	49.00
tblVehicleTrips	PR_TP	0.00	100.00
tblVehicleTrips	WD_TR	0.00	1.00

2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0150	5.0000e-005	5.2700e-003			2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005						0.0109
Energy	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000	0.0000						96.3185
Mobile	0.4412	3.7427	8.1614		2.7161	0.0410	2.7572	0.7302	0.0388	0.7690						3,101.1995
Waste						0.0000	0.0000		0.0000	0.0000						0.0000

Water						0.0000	0.0000		0.0000	0.0000						0.0000
Total	**0.4563**	**3.7427**	**8.1667**		**2.7161**	**0.0411**	**2.7572**	**0.7302**	**0.0388**	**0.7690**						**3,197.5289**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0150	5.0000e-005	5.2700e-003			2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005						0.0109
Energy	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000	0.0000						96.3185
Mobile	0.4412	3.7427	8.1614		2.7161	0.0410	2.7572	0.7302	0.0388	0.7690						3,101.1995
Waste						0.0000	0.0000		0.0000	0.0000						0.0000
Water						0.0000	0.0000		0.0000	0.0000						0.0000
Total	**0.4563**	**3.7427**	**8.1667**		**2.7161**	**0.0411**	**2.7572**	**0.7302**	**0.0388**	**0.7690**						**3,197.5289**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.4412	3.7427	8.1614		2.7161	0.0410	2.7572	0.7302	0.0388	0.7690						3,101.1995
Unmitigated	0.4412	3.7427	8.1614		2.7161	0.0410	2.7572	0.7302	0.0388	0.7690						3,101.1995

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Unenclosed Parking with Elevator	570.00	0.00	0.00	7,261,800	7,261,800
Total	570.00	0.00	0.00	7,261,800	7,261,800

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Unenclosed Parking with Elevator	49.00	49.00	49.00	0.00	100.00	0.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Unenclosed Parking with Elevator	0.558186	0.040947	0.190770	0.110456	0.017401	0.005228	0.022658	0.042795	0.002118	0.002805	0.005569	0.000308	0.000759

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000						96.3185
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000						96.3185
NaturalGas Mitigated	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000	0.0000						0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000	0.0000						0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Unenclosed Parking with Elevator	0	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000	0.0000						0.0000
Total		**0.0000**	**0.0000**	**0.0000**			**0.0000**	**0.0000**		**0.0000**	**0.0000**						**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Unenclosed Parking with Elevator	0	0.0000	0.0000	0.0000			0.0000	0.0000		0.0000	0.0000						0.0000
Total		**0.0000**	**0.0000**	**0.0000**			**0.0000**	**0.0000**		**0.0000**	**0.0000**						**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Unenclosed Parking with Elevator	329800				96.3185
Total					**96.3185**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e

Land Use	kWh/yr	MT/yr			
Unenclosed Parking with Elevator	329800				96.3185
Total					**96.3185**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0150	5.0000e-005	5.2700e-003			2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005						0.0109
Unmitigated	0.0150	5.0000e-005	5.2700e-003			2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005						0.0109

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.5500e-003					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	0.0110					0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	5.0000e-004	5.0000e-005	5.2700e-003			2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005						0.0109
Total	**0.0150**	**5.0000e-005**	**5.2700e-003**			**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**						**0.0109**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.5500e-003					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	0.0110					0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	5.0000e-004	5.0000e-005	5.2700e-003			2.0000e-005	2.0000e-005		2.0000e-005	2.0000e-005						0.0109
Total	**0.0150**	**5.0000e-005**	**5.2700e-003**			**2.0000e-005**	**2.0000e-005**		**2.0000e-005**	**2.0000e-005**						**0.0109**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated				0.0000
Unmitigated				0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Unenclosed Parking with Elevator	0 / 0				0.0000
Total					**0.0000**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Unenclosed Parking with Elevator	0 / 0				0.0000
Total					**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated				0.0000
Unmitigated				0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Unenclosed Parking with Elevator	0				0.0000
Total					**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			

Unenclosed Parking with Elevator	0			0.0000
Total				**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix D:

Federal Transit Administration Noise Impact Assessment Spreadsheet

Federal Transit Administration
Noise Impact Assessment Spreadsheet

version: 7/3/2007

Project:	GSA Parking Garage

Receiver Parameters	
Receiver:	Receiver 1
Land Use Category:	2. Residential
Existing Noise (Measured or Generic Value):	65 dBA

Noise Source Parameters	
Number of Noise Sources:	1

Noise Source Parameters		Source 1
	Source Type:	Stationary Source
	Specific Source:	Parking Garage
Daytime hrs	Avg. Number of Autos/hr	570
Nighttime hrs	Avg. Number of Autos/hr	100
Distance	Distance from Source to Receiver (ft)	100
	Number of Intervening Rows of Buildings	0
Adjustments	Noise Barrier?	No

Project Results Summary

Existing Ldn:	65 dBA
Total Project Ldn:	57 dBA
Total Noise Exposure:	66 dBA
Increase:	1 dB
Impact?:	None

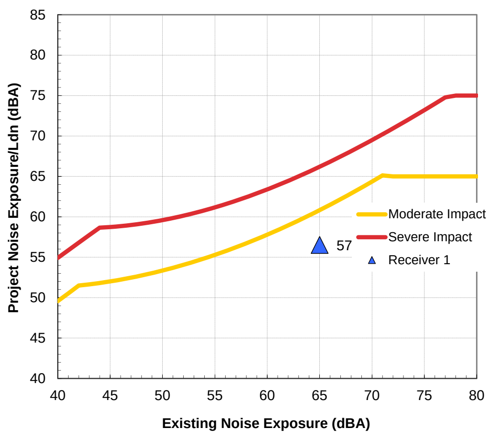
Distance to Impact Contours

Dist to Mod. Impact Contour (Source 1):	67 ft
Dist to Sev. Impact Contour (Source 1):	41 ft

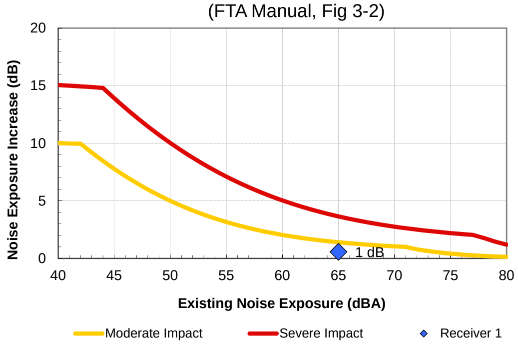
Source 1 Results

Leq(day):	55.4 dBA
Leq(night):	47.9 dBA
Ldn:	56.5 dBA

Noise Impact Criteria
(FTA Manual, Fig 3-1)



Increase in Cumulative Noise Levels Allowed
(FTA Manual, Fig 3-2)



Appendix E:

TJKM Transportation Consultants Traffic Impact Study

Traffic Impact Study Report

Dublin Transit Center

Parking Garage

Dublin, California

October 16, 2018

TJKM

Contents

Tables

Figures

Appendices

EXECUTIVE SUMMARY

This report summarizes the results of the Traffic Impact Study (TIS) conducted for the proposed Dublin Transit Station Parking Garage to be located north of the existing BART parking garage adjacent to the Dublin-Pleasanton BART station. Alameda County proposes to construct a parking garage located northeast of the Dublin/Pleasanton BART station, adjacent to I-580 in the City of Dublin. The proposed garage will have five stories and will include approximately 570 new parking spaces.

The proposed access to the proposed garage will be via a single full access driveway onto Campus Drive. Campus Drive will be improved as a part of this project between Martinelli Way and the east-west portion of Arnold Way.

Project effects on the study area roadway facilities were determined by developing the impacts that Project traffic would have on intersections in the vicinity of the site as well as on regional roadway and freeway segments.

To evaluate the impacts on the transportation infrastructure due to the addition of traffic from the proposed project, 22 intersections were evaluated during the weekday a.m. peak hour and the p.m. peak hour under four study scenarios. The study intersections were evaluated under No Project and Plus Project scenarios for Existing and Near-Term Conditions. For the purposes of this analysis, potential traffic operational impacts from the proposed project are identified based on established traffic operational thresholds of the cities of Dublin and Pleasanton.

In 2016 BART considered a project to expand the existing parking garage immediately south of the garage now proposed by Alameda County. TJKM prepared a comprehensive traffic impact study for the BART project. The BART garage expansion project was subsequently abandoned. The BART project would have created a net increase of 540 parking stalls compared with the current project's 570 stalls. Because the two projects have essentially identical in size and location, the impacts of the two projects are the same. Therefore, most of the information from the earlier study has been utilized in the preparation of this traffic impact study.

Project Trip Generation

Based on the data from Dublin Transit Center Draft EIR (*July 2001 Appendix 8.7 Traffic report Table 3 on page 27*), trip generation rates were derived for weekday a.m. and p.m. peak hours. The proposed net development of 570 parking stalls is expected to generate a net of 308 trips (268 inbound and 40 outbound) during the a.m. peak hour and 245 trips (73 inbound and 172 outbound) during the p.m. peak hour.

Existing Conditions

Under this scenario, all the study intersections and roadway segments operate within the standards of the City of Dublin during the a.m. and p.m. peak hours.

Existing plus Project Conditions

Under this scenario, all the study intersections and roadway segments operate within the standards of the City of Dublin during the a.m. and p.m. peak hours. Therefore, the project is expected to have less-than-significant impact at all the study intersections under Existing plus Project Conditions.

Near-Term without Project Conditions

Under this scenario, all the study intersections and roadway segments operate within the standards of the City of Dublin during the a.m. and p.m. peak hours.

Near-Term plus Project Conditions

Under this scenario, all the study intersections and roadway segments operate within the standards of the City of Dublin during the a.m. and p.m. peak hours. Therefore, the project is expected to have less-than-significant impact at all the study intersections under Near-Term plus Project Conditions.

Queuing and Driveway Analysis

The proposed project does not create a significant impact on the expected left-turn queues at the selected study intersections in both Existing and Near-Term with project conditions.

INTRODUCTION

This report presents the analysis and findings of the Traffic Impact Study (TIS) for the proposed Dublin Transit Center Parking Garage near the existing BART parking garage structure in the city of Dublin. Alameda County proposes to construct a new five level parking garage located north of the Dublin/Pleasanton BART station garage, adjacent to I-580 in the City of Dublin. The proposed garage will construct approximately 570 new structured parking spaces. The garage is expected to be used primarily by BART patrons. In combination with the existing BART parking, at project completion there will be approximately 2,180 parking spaces on the site for BART patrons.

The proposed access to the new garage will be via one new full access driveway onto Campus Drive, a two–lane roadway that connects Martinelli Way on the north with the east-west portion of Arnold Drive on the south.

This chapter discusses the project purpose, project study area, analysis scenarios and methods, and criteria used to identify significant impacts. The study addresses the project's impacts on the roadway system. Projects impacts were evaluated following the guidelines of the City of Dublin, City of Pleasanton, Tri – Valley Transportation Council (TVTC) and Alameda CTC.

STUDY INTERSECTIONS AND SCENARIOS

TJKM evaluated traffic conditions at 22 study intersections during a.m. and p.m. peak hour on a typical weekday. The study intersections were selected in consultation with the City of Dublin staff based on a review of the project location, and the amount of traffic that could be added to the intersections in the site vicinity. The peak periods observed were between 7 - 9 a.m. and 4 - 6 p.m. on weekdays. Although two-hour peak period traffic counts were conducted, the highest single one hour period recorded for each was used in the analysis. Throughout this report, these peak hours are identified as the a.m. and p.m. peak hours. The study intersections and associated traffic controls are as follows:

1. Dougherty Road and Scarlett Drive[1] (Signal)
2. Dougherty Road and Dublin Boulevard[1](Signal)
3. Dougherty Road and Westbound I-580 Ramps[2] (Signal)
4. Hopyard Road and Eastbound I-580 Ramps[2] (Signal)
5. Dublin Boulevard and Scarlett Drive[1] (Signal)
6. Dublin Boulevard and Demarcus Boulevard[1] (Signal)
7. Dublin Boulevard and Iron Horse Parkway[1] (Signal)
8. Dublin Boulevard and Arnold Road[1] (Signal)
9. Arnold Road and Central Parkway[1] (Signal)
10. Gleason Boulevard and Hacienda Drive[1] (Signal)
11. Dublin Boulevard and Hacienda Drive[1] (Signal)
12. Hacienda Drive and Martinelli Way/ Hacienda Crossings[1] (Signal)
13. Hacienda Drive and Westbound I-580 Ramps[2] (Signal)
14. Hacienda Drive and Eastbound I-580 Ramps[2] (Signal)
15. Dublin Boulevard and Hibernia Drive[1] (Signal)

16. Dublin Boulevard and Myrtle Drive/Toyota Drive[1] (Signal)
17. Tassajara Road and Dublin Boulevard[1] (Signal)
18. Tassajara Road and Westbound I-580 Off Ramp[2] (Signal)
19. Santa Rita Road and Eastbound I-580 Off Ramp/Pimlico Drive[2] (Signal)
20. Arnold Road and Martinelli Way[1] (Signal)
21. Iron Horse Parkway and Martinelli Way[1] (Unsignalized)
22. Hacienda Drive and Owens Drive[2] (Signal)

Notes: [1] Denotes City of Dublin Intersection
[2] Denotes City of Pleasanton Intersection

Figure 1 illustrates the study intersections and the vicinity map of the proposed project. In addition to the above listed study intersections, the analysis also includes the following freeway segments. **Figure 2** shows the site plan for the proposed project.

1. I-680 between Alcosta Boulevard and I-580
2. I-680 between I-580 and Stoneridge Drive
3. I-580 between Fallon Road and Tassajara Road
4. I-580 between Tassajara Road and Hacienda Drive
5. I-580 between Hacienda Drive and Hopyard Road
6. I-580 between Hopyard Road and I-580 Ramps

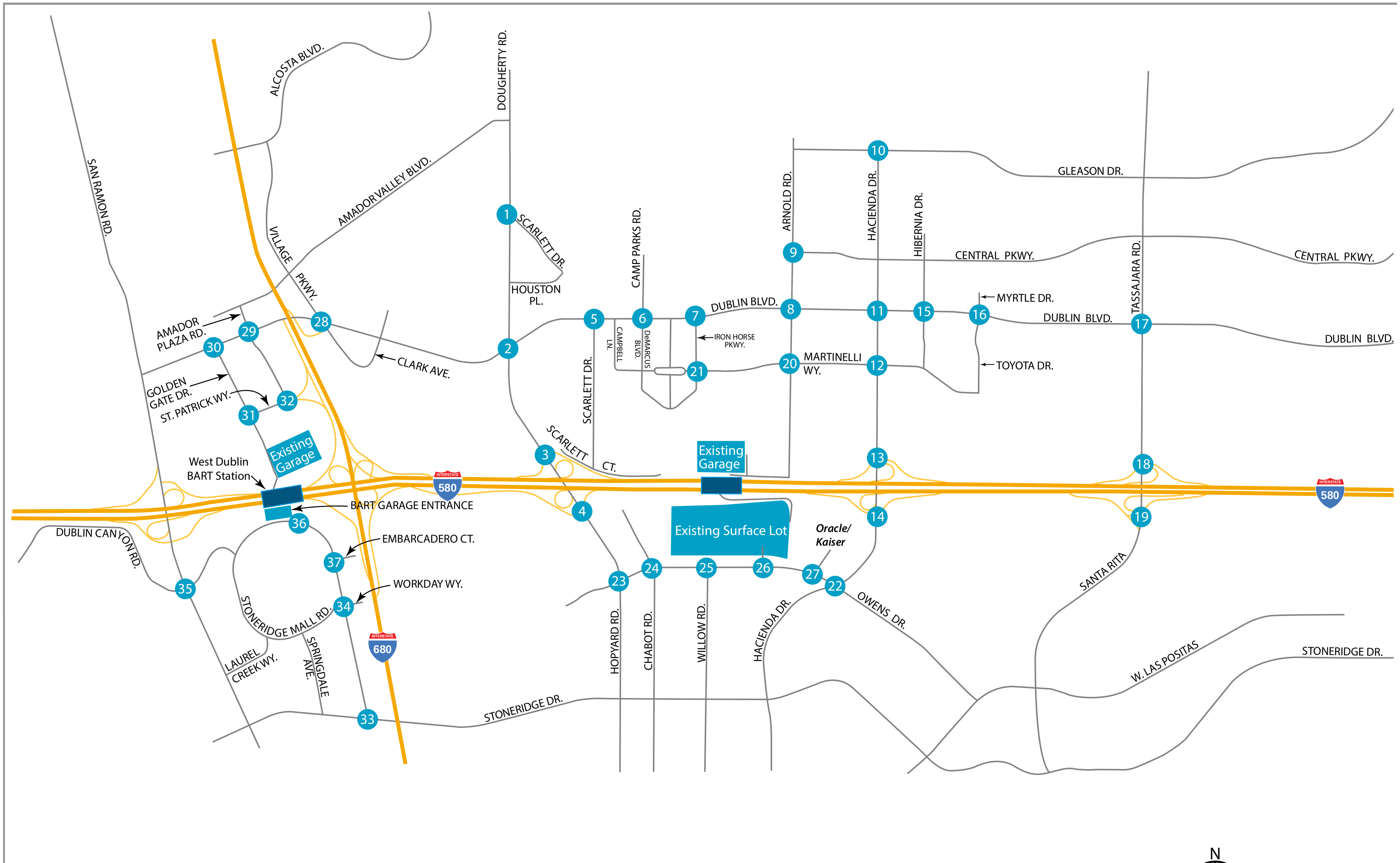
The following Metropolitan Transportation System (MTS) roadway segments on Dublin Boulevard, Dougherty Road, and Tassajara Road are analyzed.

1. Dougherty Road North of Scarlett Drive
2. Dougherty Road between Scarlett Drive and Dublin Boulevard
3. Dougherty Road between Dublin Boulevard and Interstate 580
4. Dougherty Road between Interstate 580 Eastbound and Westbound ramps
5. Hopyard Road between Interstate 580 Eastbound ramps and Owens Drive
6. Dublin Boulevard west of Dougherty Road
7. Dublin Boulevard between Dougherty Road and Scarlett Drive
8. Dublin Boulevard between Scarlett Drive and DeMarcus Boulevard
9. Dublin Boulevard between DeMarcus Boulevard and Iron Horse Parkway
10. Dublin Boulevard between Iron Horse Parkway and Arnold Road
11. Dublin Boulevard between Arnold Road and Hacienda Drive
12. Dublin Boulevard between Hacienda Drive and Hibernia Drive
13. Dublin Boulevard between Hibernia Drive and Toyota Drive
14. Dublin Boulevard between Toyota Drive and Tassajara Road
15. Dublin Boulevard east of Tassajara Road
16. Tassajara Road North of Dublin Boulevard
17. Tassajara Road between Dublin Boulevard and Interstate I 580 WB on-off ramps
18. Tassajara Road between Interstate I 580 WB on-off ramps and Pimlico Drive
19. Santa Rita Road between Pimlico Drive and Las Positas Boulevard

This study addresses the following four traffic scenarios:

- **Existing Conditions** – Existing volumes obtained from traffic counts and the existing roadway system configuration.
- **Existing plus Project Conditions** – Existing volumes obtained from traffic counts plus traffic estimated for the project. The roadway system is the same as the Existing Conditions scenario.
- **Near-Term without Project Conditions -** This scenario is similar to the Existing Conditions but with the traffic estimates for approved and pending developments, and /or traffic increases due to regional growth. The scenario reflects likely conditions in the next 10 years. Traffic forecasts for this scenario were developed based using the City of Dublin Travel Demand Model.
- **Near-Term with Project Conditions** – This scenario is identical to Near-Term Conditions, but with the addition of traffic estimated for the project.

Vicinity Map



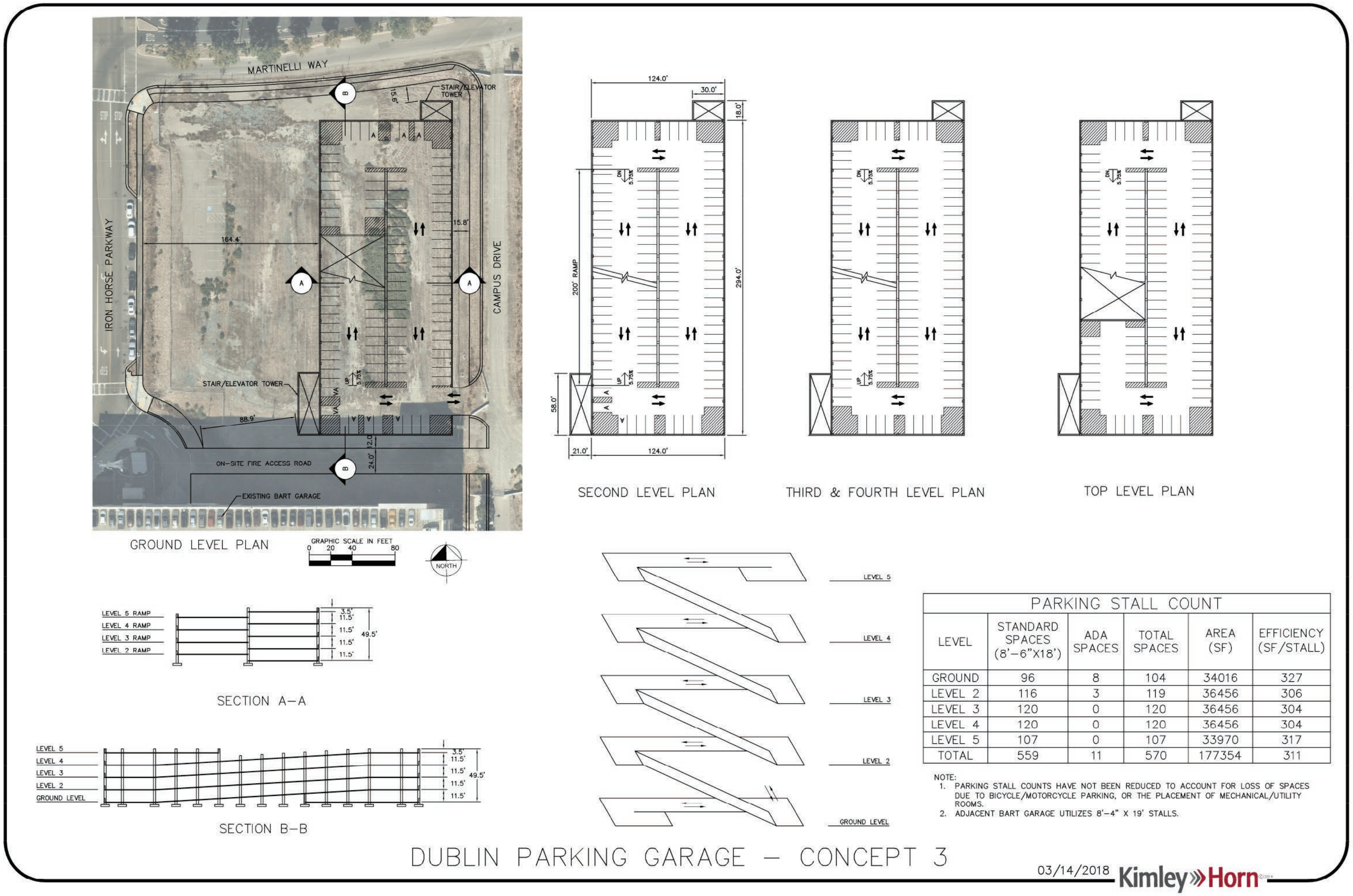
LEGEND

X Study Intersection

157-252

Figure 1

Site Plan



PARKING STALL COUNT

LEVEL	STANDARD SPACES (8'–6"X18')	ADA SPACES	TOTAL SPACES	AREA (SF)	EFFICIENCY (SF/STALL)
GROUND	96	8	104	34016	327
LEVEL 2	116	3	119	36456	306
LEVEL 3	120	0	120	36456	304
LEVEL 4	120	0	120	36456	304
LEVEL 5	107	0	107	33970	317
TOTAL	559	11	570	177354	311

NOTE:
1. PARKING STALL COUNTS HAVE NOT BEEN REDUCED TO ACCOUNT FOR LOSS OF SPACES DUE TO BICYCLE/MOTORCYCLE PARKING, OR THE PLACEMENT OF MECHANICAL/UTILITY ROOMS.
2. ADJACENT BART GARAGE UTILIZES 8'–4" X 19' STALLS.

STUDY METHODOLOGY

LEVEL OF SERVICE ANALYSIS METHODOLOGY

The operations of roadway facilities are described with the term “level of service” (LOS). LOS is a qualitative description of traffic flow based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels of service are defined ranging from LOS A (i.e., free flow conditions) to LOS F (over capacity conditions). LOS E corresponds to operations “at capacity.” When volumes exceed capacity, stop-and-go conditions result and operations are designated as LOS F. The City of Dublin generally strives to maintain LOS D or better for peak hour intersection operations.

Different methods are used to assess signalized and unsignalized (stop-controlled) intersections. Vehicle delay was calculated using the 2000 Highway Capacity Manual as implemented by the Synchro 9.0 software. The City of Dublin has not yet adopted use of the HCM 2010 methodology.

Signalized Intersections

Operations of signalized intersections were evaluated using the method from Chapter 16 of the Transportation Research Board’s *2000 Highway Capacity Manual,* which uses various intersection characteristics (such as traffic volumes, lane geometry, and signal phasing) to estimate the average control delay experienced by motorists traveling through an intersection. Control delay incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. **Table 1** summarizes the relationship between average delay per vehicle and Level of Service (LOS) for signalized intersections. This method evaluates each intersection in isolation and the effects of vehicle queue spillback are not considered in the analysis results.

Unsignalized Intersections

Operations at unsignalized intersections were evaluated using the method from Chapter 17 of the Transportation Research Board’s 2000 Highway Capacity Manual. With this method, operations are defined by the average control delay per vehicle (measured in seconds) for each movement that must yield the right-of-way. At two-way or side street-controlled intersections, the control delay (and LOS) is calculated for each controlled movement, the left-turn movement from the major street, and the entire intersection. For controlled approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. The delays for the entire intersection and for the movement or approach with the highest delay are reported. **Table 2** summarizes the relationship between delay and LOS for unsignalized intersections.

Table 1: Level of Service Criteria for Signalized Intersections

Level of Service	Description	Delay in Seconds
A	Progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	<10.0
B	Progression is good, cycle lengths are short, or both. More vehicles stop than with LOS A, causing higher levels of average delay.	> 10.0 to 20.0
C	Higher congestion may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, though many still pass through the intersection without stopping.	>20.0 to 35.0
D	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume to capacity (V/C) ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	>35.0 to 55.0
E	This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	>55.0 to 80.0
F	This level is considered unacceptable with oversaturation, which is when arrival flow rates exceed the capacity of the intersection. This level may also occur at high V/C ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to such delay levels.	>80.0

Source: 2000 Highway Capacity Manual.

Table 2: Level of Service Criteria for Unsignalized Intersections

Level of Service	Description	Delay in Seconds
A	Little or no delays	≤10.0
B	Short traffic delays	> 10.0 to 15.0
C	Average traffic delays	> 15.0 to 25.0
D	Long traffic delays	> 25.0 to 35.0
E	Very long traffic delays	> 35.0 to 50.0
F	Extreme traffic delays with intersection capacity exceeded	>50.0

Source: 2000 Highway Capacity Manual.

MTS Freeway and Roadway Segment Analysis

Operations of the MTS freeway and surface street segments were assessed based on volume-to-capacity (V/C) ratios. For freeway segments, a per-lane capacity of 2,100 vehicles per hour was used. For surface streets, a per-lane capacity of 1,100 vehicles per hour was used. This methodology is consistent with the approach used for other projects in both Dublin and other communities within Alameda County. These capacities do not reflect additional capacity provided at intersections through turn pockets. Roadway segments with a V/C ratio greater than 1.0 are assigned LOS F. Volume-to-capacity ratios and the corresponding levels of service are shown in **Table 3**.

Table 3: Level of Service Criteria for Unsignalized Intersections

Level of Service	V/C[1]
A	<= 0.60
B	0.61 to 0.70
C	0.71 to 0.80
D	0.81 to 0.90
E	0.91 to 1.00
F	> 1.00

Notes: [1]Volume to Capacity ratio, Source: 2000 Highway Capacity Manual

SIGNIFICANT IMPACT CRITERIA/LEVEL OF SERVICE STANDARDS

The determination of significance for project impacts is based on applicable policies, regulations, goals, and guidelines defined by the City of Dublin, City of Pleasanton, Alameda CTC, and Caltrans.

The impacts of the project were evaluated by comparing the results of the level of service calculations under Existing with Project, and Near-Term with Project conditions to the results under Existing, and Near-Term without Project conditions, respectively. The following criteria were used to identify significant off-site intersection impacts of the proposed project under the various criteria.

City of Dublin

Impacts to City of Dublin intersections could be considered significant if the Project would result in any of the following:

- The project would conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit. A significant impact could be identified:

- If a signalized intersection is projected to operate within delay ranges associated with less-than-capacity conditions (i.e., LOS D or better with an average control delay of equal to or less than 55 seconds per vehicle) without the project and the project is expected to cause the facility to operate at a LOS E or F (unless within the boundaries of the Downtown Dublin Specific Plan area);
- If the intersection is already unacceptable operations (i.e., LOS E or LOS F) under no project conditions, the project adds 50 or more peak hour trips.
- A queuing impact would be identified if:
  - project traffic causes the 95th percentile queue in a left turn pocket to extend beyond the turn pocket by 25 feet or more (i.e., the length of one vehicle) into adjacent traffic lanes that operate (i.e., move) separately from the left turn lane; or
  - If the 95th percentile queue already exceeds that turn pocket length under no project conditions, the project traffic lengthens the queue by 25 feet or more.
- If the operations of an unsignalized study intersection is projected to decline with the addition of project traffic, and if the installation of a traffic signal based on the Manual on Uniform Traffic Control Devices (MUTCD) Peak Hour Signal Warrant (Warrant 3) would be warranted.

For intersections that meet the above criteria, capacity-enhancing measures that do not degrade other modes of travel will be considered, including upgrading or installing signal equipment, extending left-turn pocket storage, providing non-motorized facilities to reduce vehicular demand, enhancing capacity on a parallel route and/or enhancing transit access to a site. The determination of a significant impact and the appropriate mitigation measure will consider the City's Complete Streets policy.

City of Pleasanton

Impacts to City of Pleasanton intersections could be considered if the Project would results in any of the following:

- For signalized intersections located in Pleasanton, an impact would be assessed if the addition of project traffic results in the deterioration of a signalized intersection from LOS D (or better) to LOS E or LOS F. Impacts were assessed based on HCM 2000 method. There are a few exceptions to the LOS standard which includes the City of Pleasanton Gateway intersections. Gateway intersections include all ramp terminal intersections on I-580. For the Gateway intersections, the LOS standard would only be below D when no reasonable mitigation exists or the necessary mitigation is contrary to other goals and policies of the City.
- For signalized intersections located in Pleasanton, an impact would be assessed at an intersection projected to operate at LOS E or F prior to the addition of project traffic, if the project adds 10 or more trips.

MTS Arterial and Freeway Segments

The Alameda CTC does not have adopted thresholds of significance for Congestion Management Plan (CMP) land use analysis purposes. The MTS roadway system in the vicinity of the project includes I-580, I-680, Dublin Boulevard, Dougherty Road, Tassajara Road, Hopyard Road, and Santa Rita Road. The LOS standard for CMA analysis of roadway segments is LOS E. An impact would be considered significant when the project traffic cause an MTS network segment to fall from an acceptable LOS E (roadway segment, freeway segment, or freeway ramp v/c ratio of 0.99 or less) in the No Project case to an unacceptable LOS F (v/c of 1.00 or more); or, if a segment is already operating at LOS F in the No Project case, the v/c ratio increases by more than 0.02 (for example, from 1.03 to 1.06).

Caltrans Facilities

Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State Highway facilities (Guide for the Preparation of Traffic Studies, Caltrans, December 2002); however, Caltrans recognizes that achieving LOS C/LOS D may not always be feasible. A standard of LOS E or better on a peak hour basis was used as the planning objective for the evaluation of potential impacts of this development on Caltrans facilities as that is the standard set for Caltrans facilities in the study area by the Alameda CTC. The following criteria were used to evaluate potential impacts to Caltrans facilities:

- If a Caltrans facility (mainline/ramp merge/ramp diverge) is projected to operate at LOS E or better without project and the project is expected to cause the facility to operate at LOS F, the impact may be considered significant.
- If a Caltrans facility is projected to operate at LOS F without project and the project is expected to increase density, the impact may be considered significant.

EXISTING CONDITIONS

This section describes existing conditions in the immediate vicinity of the proposed project, including roadway facilities, bicycle and pedestrian facilities, and available transit service. In addition, existing traffic volumes and operations are presented for the study intersection, including the results of LOS calculations.

EXISTING SETTING AND ROADWAY SYSTEM

Important roadways adjacent to the project site are discussed below:

Interstate 580 (I-580) is a twelve lane east-west freeway that connects Dublin with local cities such as Livermore and Pleasanton as well as regional origins and destinations such as Oakland, Hayward and Tracy. In the vicinity of the proposed Project, I-580 carries approximately 216,000 vehicles per day (vpd) (according to Caltrans 2014 Traffic Volumes on California State Highways) between Hacienda Drive and Hopyard Road. I-580 is most directly accessible to the project via the Hacienda Drive and Hopyard interchanges. I-580 is a designated route of regional significance in the Tri-Valley Transportation Plan and Action Plan for Routes of Regional Significance (Tri-Valley Action Plan). Express lanes opened on I-580 in early 2016. In the westbound direction, one express Lane is provided between Greenville Road to west of the I-580/I-680 interchange. In the eastbound direction, two express lanes are provided between Hacienda Drive and Greenville Road. Carpools are allowed to use the lanes for free while solo-drivers are able to use by paying a toll via a FasTrak toll tag

Interstate 680 (I-680) is a six-to-eight lane north-south freeway through Alameda and Contra Costa Counties serving such communities as Dublin, Pleasanton, and San Ramon. I-680 provides access to the south to Fremont, Milpitas and San Jose, and north to San Ramon, Danville, Walnut Creek and beyond. In the vicinity of the City of Dublin, I-680 carries approximately 175,000 vpd (Caltrans). I-680 is a designated route of regional significance in the Tri-Valley Action Plan.

Dublin Boulevard is an east-west principal arterial roadway that extends from west of San Ramon Road to its current terminus at Fallon Road. The City of Dublin General Plan contemplates extending Dublin Boulevard to North Canyons Parkway in Livermore. It is generally a four to six lane facility with a landscaped median. No on-street parking is permitted on this roadway. According to the Tri-Valley Transportation Plan (TVTP), Dublin Boulevard is a designated route of regional significance. This roadway provides access to residential and commercial/retail areas. Bicycle lanes and sidewalks are provided on portions of Dublin Boulevard.

Dougherty Road is a north-south principal arterial roadway and a designated route of regional significance. The roadway continues south of I-580 into Pleasanton as Hopyard Road and connects to Crow Canyon Road in San Ramon to the north. Dougherty Road is generally a six lane facility, with additional capacity at intersections to accommodate high volumes of turning vehicles to/from Interstate 580. On-street parking is not generally provided along Dougherty Road. This roadway provides access to residential and commercial/retail areas. Sidewalks are provided on portions of the roadway.

Scarlett Drive is a northwest-southeast arterial roadway that will ultimately connect Dougherty Road to Dublin Boulevard. Currently Scarlett Drive is discontinuous between Dublin Boulevard and Houston Place. Scarlett Drive continues south of Dublin Boulevard to Scarlett Court. In this area it is a designated residential collector roadway with on-street parking generally permitted. Scarlett Drive parallels the Iron Horse Trail regional trail and also provides bicycle lanes along a portion of the roadway in addition to some sidewalk facilities.

Hopyard Road is a north-south principal arterial roadway and a designated route of regional significance. The roadway connects extends from I-580 southerly to Del Valle Parkway. Hopyard Road is generally a four to six lane facility, with additional capacity at intersections to accommodate high volumes of turning vehicles. This roadway provides access to residential and commercial/retail areas.

Demarcus Boulevard/Sterling Street is primarily a two lane north/south roadway north of the project area and provides access to residential uses and the Dublin/Pleasanton BART station. Demarcus Boulevard begins at Dublin Boulevard and continues south to the BART station. North of its intersection with Dublin Boulevard it becomes Sterling Street, currently under construction in the new Dublin Crossings residential development.

Iron Horse Parkway is primarily a three lane north/south roadway, with two northbound lanes and one southbound lane. Iron Horse Parkway provides access to residential uses and the Dublin/Pleasanton BART station. Iron Horse Parkway begins at Dublin Boulevard and continues south to the BART station. Iron Horse Parkway will provide indirect access to the project area via its intersection with Martinelli Way and Dublin Boulevard. In the future, the roadway will extend northerly into the Dublin Crossing development and will be called Bullion Street.

Arnold Road is primarily a two lane north/south roadway east of the project area and provides access to residential uses, commercial/retail areas, and the BART parking garage. Arnold Road extends from Gleason Drive in the north to I-580 in the south, where it makes a 90 degree turn to the Dublin BART parking garage access road. Arnold Road will provide direct access to the project area via a new street, Campus Drive.

Gleason Drive is an east-west arterial roadway approximately one half mile north of Dublin Boulevard that connects Arnold Road in the west to Fallon Road in the east. It generally provides two travel lanes in each direction with a landscaped median, and sidewalks along portions of the roadway that have fronting development.

Central Parkway is an east-west collector roadway between Arnold Road and Fallon Road. It generally provides one travel lane in each direction with a landscaped median, bicycle lanes and sidewalks along portions of the roadway that have fronting development. On-street parking is allowed on some portions of the roadway.

Hacienda Drive is a north-south roadway that extends from West Las Positas Boulevard in Pleasanton to Gleason Drive in Dublin, with a full interchange at I-580. From West Las Positas Road to Dublin Boulevard, Hacienda Drive is a designated principal arterial roadway that generally provides three travel lanes in each direction with additional capacity at intersections to accommodate high volumes of turning vehicles. North of Dublin Boulevard, it is a designated minor arterial with two to three travel lanes in each direction, with a landscaped median. According to the Tri-Valley Transportation council (TVTP), Hacienda Drive is a potential future route of regional significance. On-street parking is typically not allowed. Sidewalks are provided along Hacienda Drive from north of the I-580 interchange to Gleason Drive.

Martinelli Way is an east-west minor arterial roadway between Iron Horse Parkway and Hacienda Drive. It generally provides two travel lanes in each direction with a landscaped median, and sidewalks along portions of the roadway. It extends easterly into the Hacienda Crossings retail center. Martinelli Way will provide indirect access to the project area via its intersections with Iron Horse Parkway and Campus Drive.

Hibernia Drive is a north-south collector street between Dublin Boulevard and Summer Glen Drive. It extends southerly into the Hacienda Crossings retail center. It generally provides one travel lane in each direction and sidewalks along portions of the roadway. This roadway provides local access to residential and commercial areas.

Myrtle Drive/Toyota Drive is a north-south collector street between Hacienda Crossings and Mangrove Drive. It generally provides one travel lane in each direction and sidewalks along both sides of the roadway. This roadway provides local access to residential areas.

Tassajara Road is a north-south principal arterial roadway that extends north from I-580 into San Ramon where it is named Camino Tassajara. South of I-580, Tassajara Road continues as Santa Rita Road, a four- to six-lane arterial in Pleasanton that connects I-580 with downtown Pleasanton. Tassajara Road is a four to six lane facility through Dublin with added capacity at intersections. Bicycle lanes are provided from Dublin Boulevard to north of N. Dublin Ranch Drive, where the roadway transitions to provide two to four travel lanes. Sidewalks are provided adjacent to the developed areas along Tassajara Road. On-street parking is not permitted. Both Tassajara Road and Santa Rita Road are routes of regional significance.

Owens Drive is an east-west principal arterial roadway that extends east from West Las Positas Boulevard and into Johnson Drive. Owens Drive is a four- to six-lane arterial in Pleasanton that connects I-580 through Johnson Drive. Bicycle lanes are provided throughout the corridor. Sidewalks are provided along both sides of Owens Drive. Owens Drive provides frontage and access to the Pleasanton side of the BART station.

EXISTING PEDESTRIAN FACILITIES

Walkability is defined as the ability to travel easily and safely between various origins and destinations without having to rely on automobiles or other motorized travel. The ideal "walkable" community includes wide sidewalks, a mix of land uses such as residential, employment, and shopping opportunities, a limited number of conflict points with vehicle traffic, and easy access to transit facilities, and services.

Pedestrian facilities consist of crosswalks, sidewalks, pedestrian signals, and off-street paths, which provide safe and convenient routes for pedestrians to access the destinations such as institutions, businesses, public transportation, and recreation facilities.

Sidewalks are provided along most roadways in Dublin and Pleasanton where land uses have been developed adjacent to the roadway. Sidewalks and crosswalks are found along virtually all previously-described local roadways in the study area. However, there are no sidewalks along the west side of Arnold Road.

The existing pedestrian facilities within the immediate vicinity study area are shown in **Figure 3.**

Existing Bicycle Facilities

Bicycle facilities in Dublin include the following general types:

- Class I: Shared Use Path - These facilities provide a completely separate right-of-way and are designated for the exclusive use of bicycles and pedestrians with vehicle cross-flow minimized.
- Class II A: Bicycle Lane - Bicycle lanes provide a restricted right-of-way and are designated for the use of bicycles for one-way travel with a striped lane on a street or highway. Bicycle lanes are generally a minimum of five feet wide. Vehicle parking and vehicle/pedestrian cross-flow are permitted.
- Class II B: Buffered Bicycle Lane - Buffered bicycle lanes are conventional bicycle lanes that provide a restricted right-of-way with an added buffer space separating the bike lane from the adjacent vehicle lane and/or parking lane. The buffered area provides greater distance between bicyclists, and parked cars and/or moving traffic and allows for bicyclists to pass one another within the bicycle lane without entering the vehicle lane. Buffered bicycle lanes are generally made up of a six foot wide bicycle lane and a two-foot wide buffer. The buffer is striped with two solid white lines with diagonal hatching or chevron markings within the buffer zone.
- Class III A: Bicycle Route with Sharrows - These bikeways provide right-of-way designated by signs or pavement markings for shared use with motor vehicles. These include sharrows or "shared-lane markings" to highlight the presence of bicyclists.

The *Dublin Bikeways Master Plan*, from 2007, describes the existing bicycle network in the City of Dublin. The existing bicycle facilities in the vicinity of the project area are described below:

- Dougherty Road – Existing Class I bicycle path that runs from the Iron Horse Regional Trail at the intersection of Scarlett Drive north to Old Ranch Drive in San Ramon parallels Dougherty Road.
- Dublin Boulevard – existing Class I bicycle path from Scarlett Drive to Tassajara Creek Trail and existing Class II bicycle lanes from Dougherty Road to Fallon Road along both sides.
- Hopyard Road – existing Class II bicycle lanes from Owens Drive to Del Valle Parkway along both sides.

- Arnold Road – existing Class II bicycle lanes from Gleason Drive to Martinelli Way along both sides.
- Central Parkway – existing Class II bicycle lanes from Arnold Road to Fallon Road along both sides.
- Gleason Drive – existing Class II bicycle lanes from Arnold Road to Fallon Road along both sides.
- Hacienda Drive – existing Class II bicycle lanes from Gleason Drive to I-580 EB Ramps.
- Tassajara Road – existing Class II bicycle lanes from Fallon Road to Dublin Boulevard along both sides.
- Santa Rita Road – existing Class II bicycle lanes from Stoneridge Drive to the I-580 eastbound Off Ramps along both the sides.
- Owens Drive – existing Class II bicycle lanes from Hopyard to W. Las Positas Road along both sides.

The Dublin General Plan, 2014, describes the proposed bicycle network in the city of Dublin. According to this, there are Class I, Class II bicycle lanes are proposed for the following roadways.

- Class II bicycle lanes are proposed on Dougherty road between Scarlett Court and Dublin Boulevard
- Class II bicycle lanes are proposed on Demarcus Boulevard between Dublin Boulevard and Iron Horse Parkway
- Class II bicycle lanes are proposed on Iron Horse Parkway between Demarcus Boulevard and Dublin Boulevard
- Class II bicycle lanes are proposed on Martinelli Way between Iron Horse Parkway and Toyota Drive
- Class I bicycle paths are proposed on Gleason Drive and Central Parkway along portions of the roadways

The existing bicycle facilities within the immediate vicinity study area are shown in **Figure 4.**

Existing Transit Facilities

Existing transit service in the project vicinity is provided by Wheels (Livermore Amador Valley Transit Authority -LAVTA), Bay Area Rapid Transit (BART), and Altamont Commuter Express (ACE). Each transit service is described below:

Wheels provides fixed-route and paratransit service throughout the Cities of Dublin, Pleasanton, and Livermore, and provides connections to other transit service providers. Wheels buses connect major destinations within its service area, including downtown areas, employment centers and transit hubs, and the BART and ACE stations. Wheels bus schedules are also coordinated with ACE and BART trains during peak commute hours. Wheels bus routes 1, 2, 3, 8, 9, 10, 12, 20x, 54, 70x, and RAPID start from East Dublin/ Pleasanton BART station. The project area is closer to the BART station and is currently served directly by Routes R, 1, 2, 3, 8, 12, 20X, 580X, 502, and503. Bus stops are provided along Dublin Boulevard.

The Contra Costa Transportation Authority (CCTA, ***County Connection***) provides transit service connecting destinations in Contra Costa County to the Tri-Valley area, including service from the East Dublin/Pleasanton BART station to the San Ramon Transit Center and Bishop Ranch Business Park. There is also a route that connects the Walnut Creek BART station to the Downtown Pleasanton ACE station. The project area is served directly by routes 35 and36; bus stops are provided along Dublin Boulevard and Dougherty Road.

Bay Area Rapid Transit (BART) provides regional transportation connections to much of the Bay Area and the Dublin/Pleasanton line provides direct access to San Francisco, with several stops in Oakland where connections may be made to other lines. The West Dublin/Pleasanton BART station is located approximately two miles from the project site. BART train frequency ranges between 15-20 minutes from approximately 5:00 AM to 12:00 AM. Based on May 2018 data from BART, approximately 8,500 passengers per day enter/exit the BART system at the East Dublin/Pleasanton station, and approximately 3,500 passengers enter/exit the BART system at the West Dublin/Pleasanton BART Station.

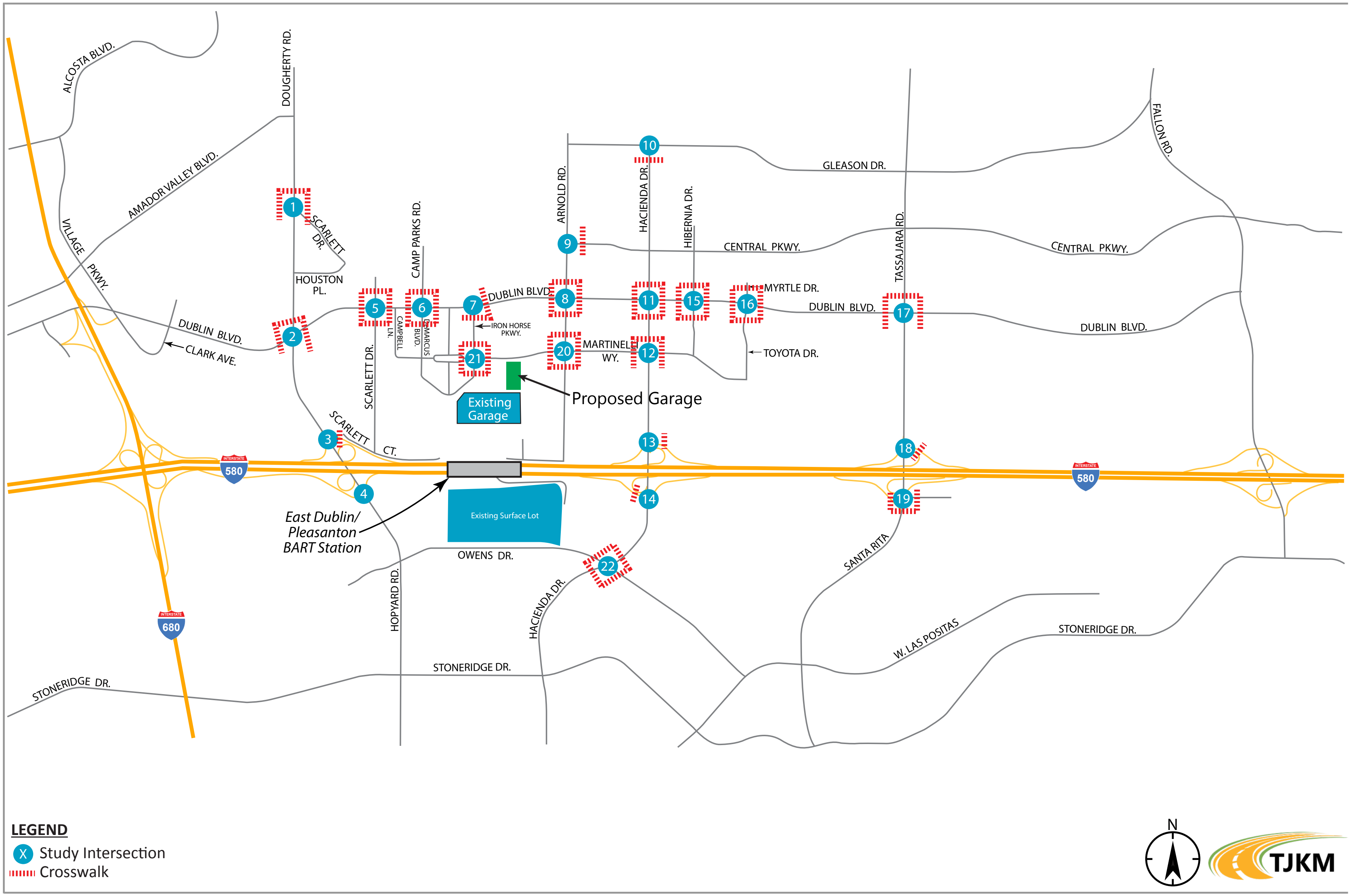
Altamont Commuter Express (ACE) operates weekday train service between Stockton and San Jose with Tri-Valley stops in Downtown Pleasanton and two locations in Livermore. During the morning commute period only westbound service from San Joaquin County to San Jose is provided, while only eastbound service is provided in the afternoon/evening commute period. There are four morning trains through Pleasanton between 5:33 AM and 8:18 AM, and four evening trains between 4:28 PM and 7:31 PM. Travel time from Stockton to Pleasanton is approximately one hour and fifteen minutes, while travel time from the Tri- Valley to San Jose is approximately one hour. Wheels provides shuttle services between the ACE stations and major employment/residential areas in Pleasanton and Livermore. ACE trains carry approximately 4,000 passengers on a typical weekday, with approximately 600 passengers boarding the ACE system at the downtown Pleasanton Station on a typical weekday.

Existing transit service within the vicinity of project are shown in **Table 4** and the existing Transit facilities within the immediate vicinity study area are shown in **Figure 5.**

Table 4: Existing Transit Services

Route	From	To	Weekdays		Weekend	
			Operating Hours	Headway (minutes)	Operating Hours	Headway (minutes)
R	West Dublin BART	West Dublin BART	6:03 a.m. – 12:37 a.m.	10 to 15	6:04 a.m. – 12:00a.m.	60
1	East Dublin BART	East Dublin BART	5:59 a.m. – 9:13 p.m.	30	7:56 a.m. – 9:10 p.m.	60
2	Dublin/Pleasanton BART	Emerald Glen Park & Fallon Middle School	6:30 a.m. – 9:10 a.m. 4:30 p.m. – 6:48 p.m.	60	…	…
3	East Dublin/Pleasanton BART	East Dublin/Pleasanton BART	3:30 a.m. – 9:22 p.m.	30	9:01 a.m. – 5:51 p.m. (Saturday)	60
8	East Dublin/Pleasanton BART	East Dublin/Pleasanton BART	6:15 a.m. – 7:02 p.m.	60	8:01 a.m. – 8:49 p.m. (Saturday) 9:01 a.m. – 2:18 p.m. (Sunday)	40-60
12	East Dublin/Pleasanton BART	Livermore Transit Center	6:30 a.m. – 10:51 p.m.	30	9:01 a.m. – 9:47 p.m. (Saturday) 9:02 a.m. – 8:47 p.m. (Sunday)	60-120
20X	East Dublin/Pleasanton BART	Livermore Transit Center	7:30 a.m. – 9:06 p.m. 4:42 a.m. – 6:21 p.m.	60	…	…
580X	East Dublin/Pleasanton BART	Livermore Transit Center	6:30 a.m. – 8:25 a.m. 5:00 p.m. – 7:25 p.m.	30	…	…
35	San Ramon Transit Center	BART Dublin/Pleasanton	6:00 a.m. - 8:17 p.m.	30	…	…
36	San Ramon Transit Center	BART Dublin/Pleasanton	6:20 a.m. – 9:00 p.m.	60	…	…
502	Dublin Ranch Village	Dublin High School	7:07 a.m. & 3:40 p.m.	NA	…	…
503	West BART Dublin	East BART Dublin	7:15 a.m. – 8:39 3:31 p.m. – 5:42 p.m.	40	….	…

Existing Pedestrian Facilities



LEGEND

X Study Intersection

Crosswalk

157-252

Figure 3

Existing Bicycle Facilities

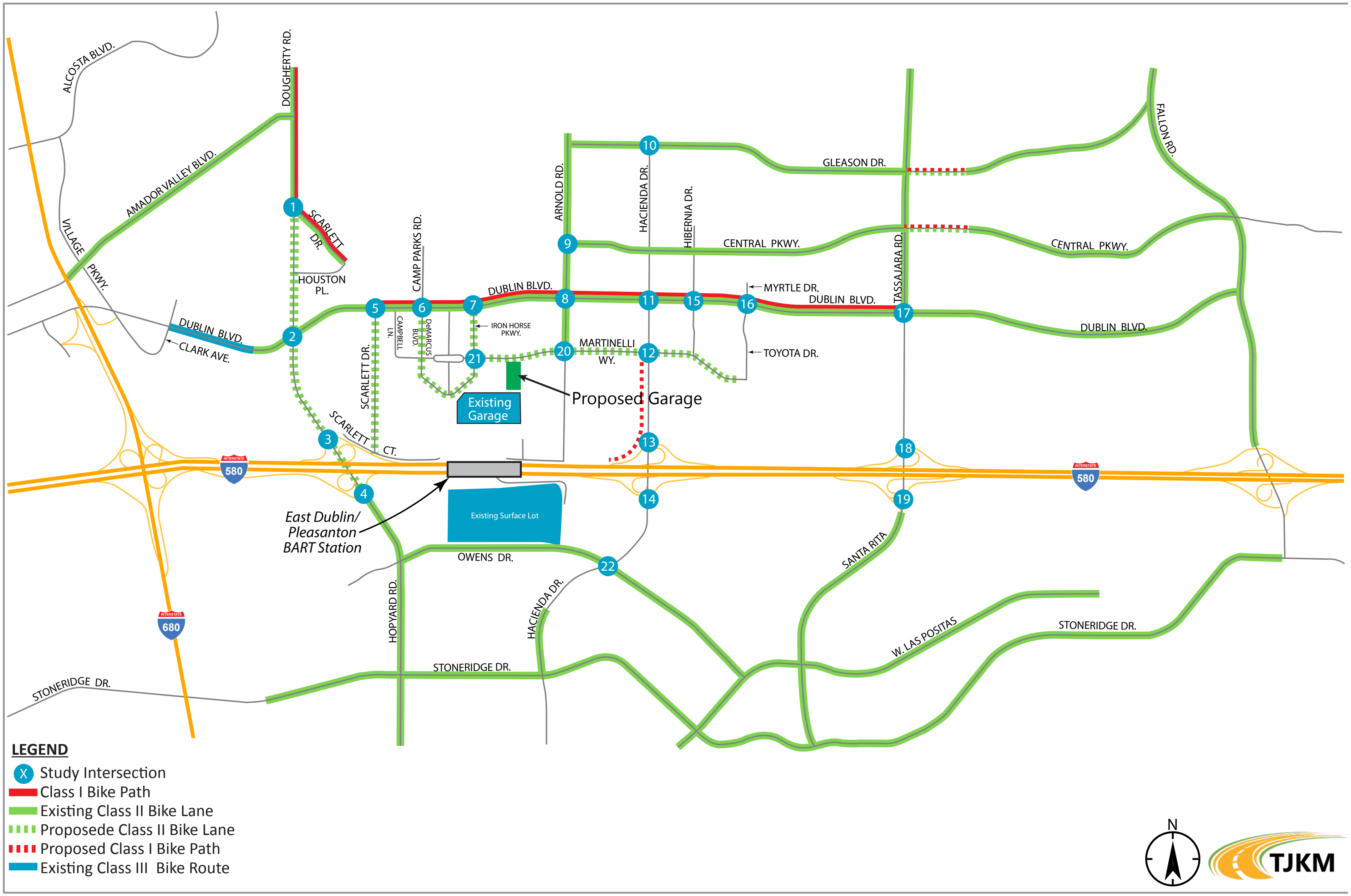


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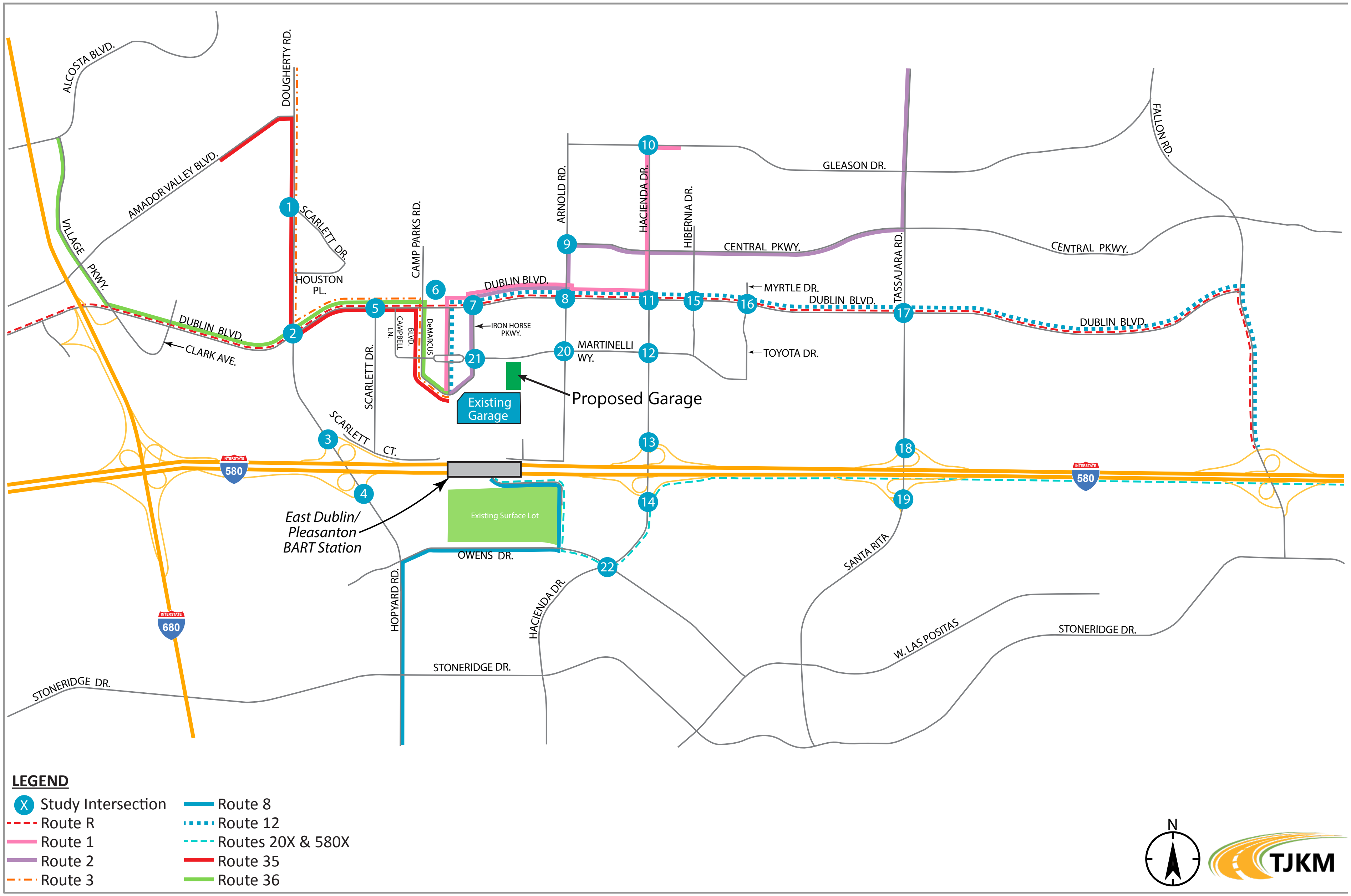
Figure 4

Existing Transit Facilities



157-252

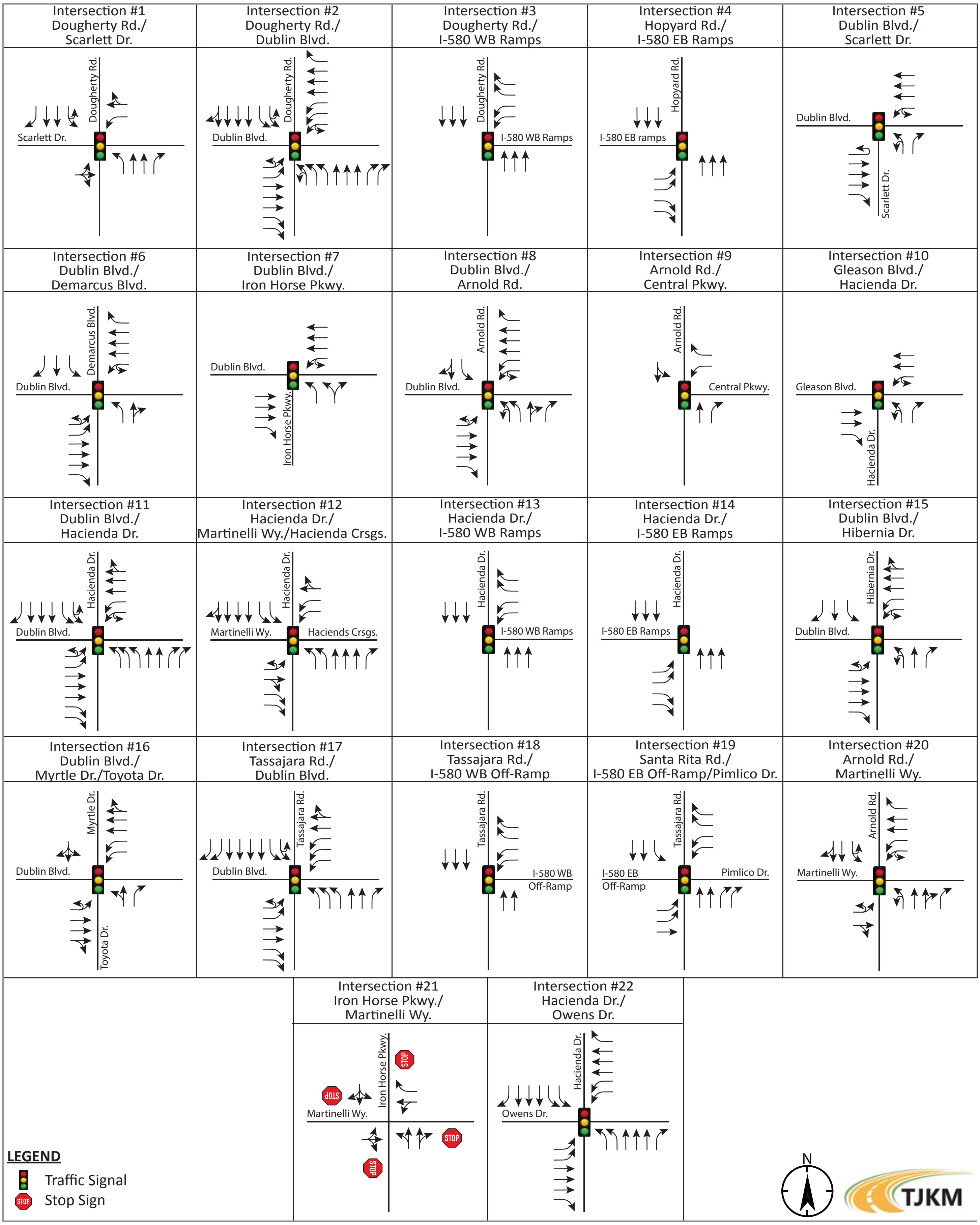
Figure 10

EXISTING PEAK HOUR VOLUMES AND LANE CONFIGURATIONS

New counts were made for most of the study intersections. The turning movement counts provided were conducted on Tuesday May 24, 2016. TJKM used counts from recent studies for the remaining intersections. It should be noted that counts used from the recent studies were conducted in 2014/2013, TJKM adjusted these counts in order to project the 2016 volumes based upon the traffic counts of the neighboring intersections 2016 counts. The existing operations of the study intersections were evaluated for the highest one-hour volume during the weekday morning and evening peak periods. Field verification of existing intersection lane configurations and traffic controls were also conducted and provide the basis for the level of service analysis for Existing Conditions.

Appendix A includes all the data sheets for the collected turning movement counts. **Figure 6** illustrates the existing lane geometry and traffic control at all the study intersections. **Figure 7** illustrates the existing conditions peak hour traffic volumes at all the study intersections.

Existing Conditions Lane Geometry and Traffic Controls



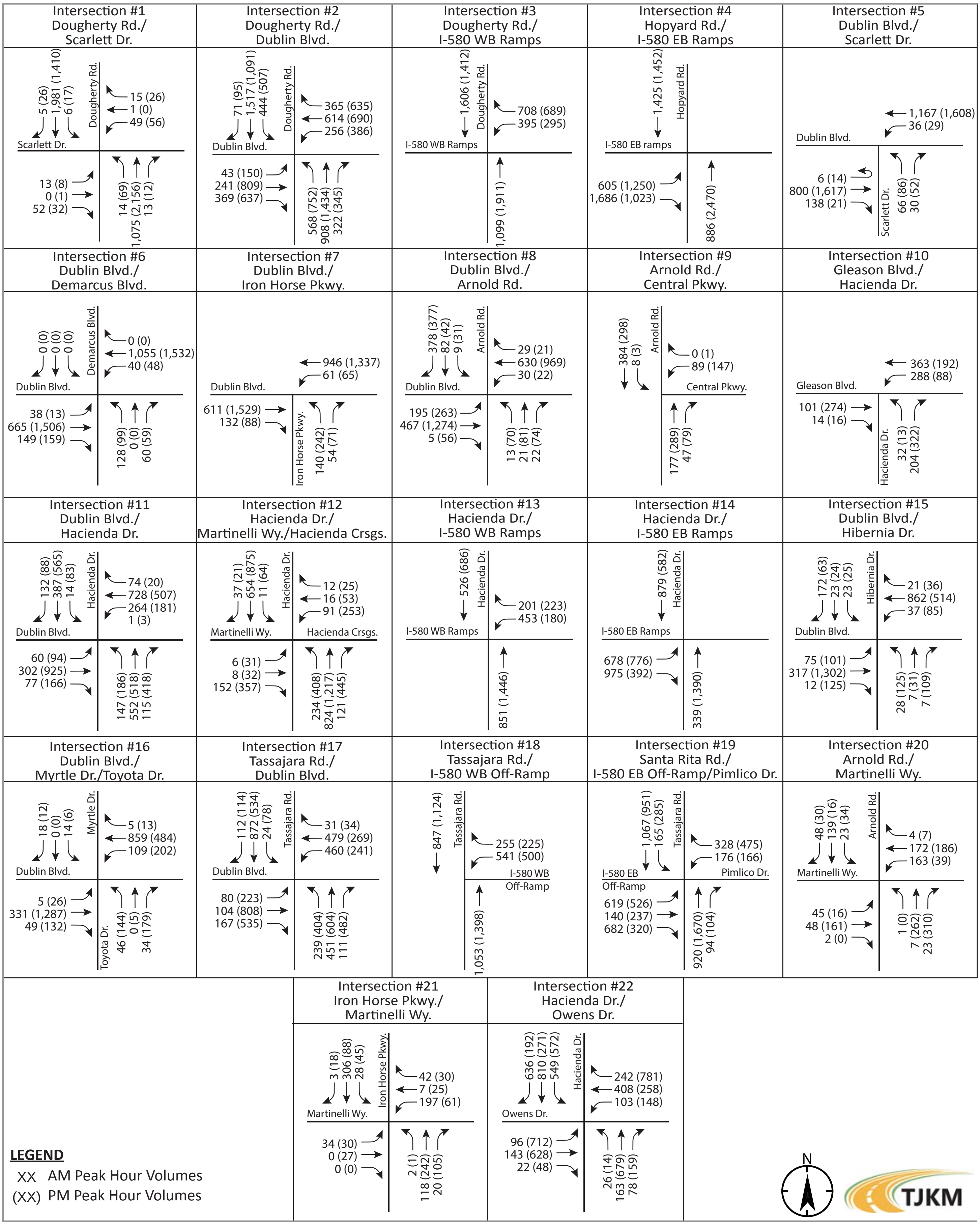
LEGEND

- Traffic Signal
- Stop Sign

157-252

Figure 6

Existing Conditions Peak Hour Traffic Volumes



157-252

Figure 7

INTERSECTION LEVEL OF SERVICE ANALYSIS – EXISTING CONDITIONS

Existing intersection lane configurations, signal timings, and peak hour turning movement volumes were used to calculate the levels of service for the study intersections during each peak hour. The peak hour factor based on the counts was applied to all study intersections for the existing analysis and a two percent heavy vehicle composition was specified for each intersection movement under existing and future conditions peak hour analysis. Synchro 9.0 operations analysis software was used to complete the HCM 2000 LOS analysis procedures for intersection. Detailed calculation sheets for Existing Conditions are contained in **Appendix B.**

Table 5 summarize peak hour levels of service at the study intersections under Existing Conditions. Under this scenario, all the intersections operate within the standards of the City of Dublin during the a.m. and p.m. peak hours expect for the intersection of Dougherty Road and Dublin Boulevard (Int. # 2) which operates at LOS E with a delay of 55.8 seconds in the p.m. peak hour.

Table 5: Existing Conditions Intersection Level of Service Analysis

ID	Study Intersections	Control	Existing Conditions AM Peak[1] Delay[2]	AM Peak[1] LOS[3]	Existing Conditions PM Peak[1] Delay[2]	PM Peak[1] LOS[3]
1	Dougherty Road and Scarlett Drive	Signalized	10.8	B	14.0	B
2	Dougherty Road and Dublin Boulevard	Signalized	35.9	D	55.8	E
3	Dougherty Road and Westbound I-580 Ramps	Signalized	12.0	B	11.2	B
4	Hopyard Road and Eastbound I-580 Ramps	Signalized	46.1	D	41.6	D
5	Dublin Boulevard and Scarlett Drive	Signalized	9.9	A	11.0	B
6	Dublin Boulevard and Demarcus Boulevard	Signalized	12.7	B	8.4	A
7	Dublin Boulevard and Iron Horse Parkway	Signalized	15.0	B	12.0	B
8	Dublin Boulevard and Arnold Road	Signalized	36.4	D	28.0	C
9	Arnold Road and Central Parkway	Signalized	6.7	A	8.9	A
10	Gleason Boulevard and Hacienda Drive	Signalized	15.5	B	10.0	A
11	Dublin Boulevard and Hacienda Drive	Signalized	39.4	D	39.4	D
12	Hacienda Drive and Martinelli Way /Hacienda Crossings	Signalized	27.7	C	42.8	D
13	Hacienda Drive and Westbound I-580 Ramps	Signalized	5.5	A	4.6	A
14	Hacienda Drive and Eastbound I-580 Ramps	Signalized	8.8	A	9.4	A
15	Dublin Boulevard and Hibernia Drive	Signalized	16.8	B	25.6	C
16	Dublin Boulevard and Myrtle Drive/Toyota Drive	Signalized	10.8	B	15.7	B
17	Tassajara Road and Dublin Boulevard	Signalized	34.5	C	40.6	D
18	Tassajara Road and Westbound I-580 Off Ramp	Signalized	6.9	A	8.3	A
19	Santa Rita Road and Eastbound I-580 Off Ramp/Pimlico Drive	Signalized	43.5	D	51.1	D
20	Arnold Road and Martinelli Way	Signalized	32.4	C	23.5	C
21	Iron Horse Parkway and Martinelli Way	All-Way Stop	13.7	B	11.1	B
22	Hacienda Drive and Owens Drive	Signalized	15.8	B	33.8	C

Notes:
[1]AM – morning peak hour, PM – evening peak hour
[2]Delay – Whole intersection weighted average control delay expressed in seconds per vehicle for signalized and all-way stop controlled intersections.
[3]LOS – Level of Service. LOS calculations conducted using the Synchro 9 level of service analysis software package, which applies the method described in the 2000 Highway Capacity Manual.
Bold text indicates intersection operates at a deficient level of service.

Freeway and Roadway Segment Analysis – Existing Conditions

A separate analysis of regional roadways is required to comply with requirements of the Alameda County Transportation Commission (Alameda CTC). The Alameda CTC requires the analysis of project impacts to Metropolitan Transportation System (MTS) roadways identified in the congestion management plan (CMP) for development projects that would generate more than 100 PM peak hour trips. As shown in Table 10, the proposed Project would generate more than 100 PM peak hour trips. Existing freeway and roadway segment peak hour volumes were obtained from Alameda Countywide Travel Demand Model for the MTS roadway system.

Operations of the MTS freeway and surface street segments were assessed based on volume-to-capacity (V/C) ratios. For freeway segments, a per-lane capacity of 2,100 vehicles per hour was used. For surface streets, a per-lane capacity of 1,100 vehicles per hour was used. These capacities do not reflect additional capacity provided at intersections through turn pockets.

Table 6 summarizes peak hour levels of service at the study roadway segments under Existing Conditions. Under this scenario, all the roadway segments operate at LOS E or better during the a.m. and p.m. peak hours expect the roadway segment on Dublin Boulevard east of Tassajara Road with LOS F in the p.m. peak hour.

Table 7 summarizes peak hour levels of service at the study freeway segments under Existing Conditions. Under this scenario, all the freeway segments operate at LOS E or better during the a.m. and p.m. peak hours.

Table 6: Existing Conditions MTS Roadway Segment Level of Service Analysis

No	Study Segments	Direction	# Lanes	AM Peak Hour Volume	PM Peak Hour Volume	AM Peak Hour V/C[1] Ratio	PM Peak Hour V/C[1] Ratio	AM Peak Hour LOS[2]	PM Peak Hour LOS[2]
1	Dougherty Road North of Scarlett Drive	Northbound	2	396	2,103	0.18	0.96	A	E
		Southbound	2	1,467	595	0.67	0.27	B	A
2	Dougherty Road between Scarlett Drive and Dublin Boulevard	Northbound	3	396	2,103	0.12	0.64	A	B
		Southbound	2	1,471	595	0.67	0.27	B	A
3	Dougherty Road between Dublin Boulevard and Interstate 580	Northbound	3	1,992	2,895	0.60	0.88	A	D
		Southbound	3	1,669	1,364	0.51	0.41	A	A
4	Dougherty Road between Interstate 580 Eastbound and Westbound ramps	Northbound	8	1,495	2,185	0.17	0.25	A	A
		Southbound	4	1,498	1,058	0.34	0.24	A	A
5	Hopyard Road between Interstate 580 Eastbound ramps and Owens Drive	Northbound	3	923	1,320	0.28	0.40	A	A
		Southbound	3	1,139	934	0.35	0.28	A	A
6	Dublin Boulevard west of Dougherty Road	Eastbound	5	692	630	0.13	0.11	A	A
		Westbound	3	1,930	1,389	0.58	0.42	A	A
7	Dublin Boulevard between Dougherty Road and Scarlett Drive	Eastbound	3	736	661	0.22	0.20	A	A
		Westbound	3	1,015	1,131	0.31	0.34	A	A
8	Dublin Boulevard between Scarlett Drive and DeMarcus Boulevard	Eastbound	3	744	684	0.23	0.21	A	A
		Westbound	3	1,035	1,144	0.31	0.35	A	A
9	Dublin Boulevard between DeMarcus Boulevard and Iron Horse Parkway	Eastbound	3	428	804	0.13	0.24	A	A
		Westbound	3	1,089	667	0.33	0.20	A	A
10	Dublin Boulevard between Iron Horse Parkway and Arnold Road	Eastbound	3	215	1,572	0.07	0.48	A	A
		Westbound	3	1,726	286	0.52	0.09	A	A
11	Dublin Boulevard between Arnold Road and Hacienda Drive	Eastbound	3	137	1,682	0.04	0.51	A	A
		Westbound	3	1,765	178	0.53	0.05	C	A
12	Dublin Boulevard between Hacienda Drive and Hibernia Drive	Eastbound	4	88	2,126	0.02	0.48	A	A
		Westbound	3	1,837	104	0.56	0.03	C	A

No	Study Segments	Direction	# Lanes	AM Peak Hour Volume	PM Peak Hour Volume	AM Peak Hour V/C[1] Ratio	PM Peak Hour V/C[1] Ratio	AM Peak Hour LOS[2]	PM Peak Hour LOS[2]
13	Dublin Boulevard between Hibernia Drive and Toyota Drive	Eastbound	3	122	2112	0.04	0.64	A	B
		Westbound	3	1796	120	0.54	0.04	A	A
14	Dublin Boulevard between Toyota Drive and Tassajara Road	Eastbound	3	122	2118	0.04	0.64	A	B
		Westbound	3	1799	119	0.55	0.04	A	A
15	Dublin Boulevard east of Tassajara Road	Eastbound	2	78	2256	0.04	**1.03**	A	**F**
		Westbound	2	1882	121	0.86	0.06	D	A
16	Tassajara Road North of Dublin Boulevard	Northbound	2	202	786	0.09	0.36	A	A
		Southbound	3	706	355	0.21	0.11	A	A
17	Tassajara Road between Dublin Boulevard and Interstate I 580 WB on-off ramps	Northbound	3	366	1322	0.11	0.40	A	A
		Southbound	4	1079	706	0.25	0.16	A	A
18	Tassajara Road between Interstate I 580 WB on-off ramps and Pimlico Drive	Northbound	3	505	1404	0.15	0.43	A	A
		Southbound	3	1281	1253	0.39	0.38	A	A
19	Santa Rita Road between Pimlico Drive and Las Positas Boulevard	Northbound	3	918	1473	0.28	0.45	A	A
		Southbound	3	1296	1195	0.39	0.36	A	A

Notes:
[1] V/C – Volume to Capacity ratio
[2] LOS – Level of Service
Bold text indicates intersection operates at a deficient Level of Service.

Table 7: Existing Conditions MTS Freeway Segment Level of Service Analysis

No	Study Segments	Direction	# Lanes	AM Peak Hour Volumes	PM Peak Hour Volumes	AM Peak Hour V/C[1] Ratio	PM Peak Hour V/C [1] Ratio	AM Peak Hour LOS[2]	PM Peak Hour LOS[2]
1	I-680 between Alcosta Boulevard and I 580 ramps	Northbound	5	6,120	5,861	0.58	0.56	A	A
		Southbound	5	5,693	6,723	0.54	0.64	A	B
2	I-680 between I 580 ramps and Stoneridge Drive	Northbound	4	4,692	5,369	0.56	0.64	A	B
		Southbound	4	6,081	4,704	0.72	0.56	C	A
3	I -580 between I -680 ramps and Hopyard Road	Eastbound	6	4,081	9,952	0.32	0.79	A	C
		Westbound	6	8,517	4,918	0.68	0.39	B	A
4	I -580 between Hopyard Road and Hacienda Drive	Eastbound	6	4,674	10,550	0.37	0.84	A	D
		Westbound	6	9,708	6,222	0.77	0.49	C	A
5	I -580 between Hacienda Drive and Santa Rita Drive	Eastbound	6	4,432	9,707	0.35	0.77	A	C
		Westbound	6	9,988	6,178	0.79	0.49	C	A
6	I -580 between Santa Rita Drive and Fallon Road	Eastbound	6	4,868	9,786	0.39	0.78	A	C
		Westbound	6	10,113	6,579	0.80	0.52	C	A

Notes:
[1] V/C – Volume to Capacity ratio
[2] LOS – Level of Service

EXISTING WITH PROJECT CONDITIONS

This analysis scenario presents the impacts of the proposed development at all the study intersections and surrounding roadway system. This scenario is identical to Existing Conditions, but with the addition of traffic from the proposed project. The amount of traffic associate with the Project was estimated using a three-step process:

1. Trip Generation – The amount of new vehicle traffic entering/exiting the proposed parking garage expansion was estimated.
2. Trip Distribution – The direction trips would use to approach and depart the area was projected.
3. Trip Assignment – Trips were then assigned to specific roadway segments and intersection turning movements.

PROJECT DESCRIPTION

The project site is located south of Dublin Boulevard, west of Hacienda Drive, north of Interstate 580 (I-580), and east of Dougherty Road. Alameda County proposes to construct a new five level parking garage located north of the Dublin/Pleasanton BART station garage, adjacent to I-580 in the City of Dublin. The proposed garage will contain approximately 570 new parking spaces. The garage is expected to be used primarily by BART patrons. In combination with the existing BART parking, at project completion there will be approximately 2,180 parking spaces on the site for BART patrons.

The proposed access to the new garage will be via one new full access driveway onto Campus Drive, a two–lane roadway that connects Martinelli Way on the north with the east-west portion of Arnold Drive on the south.

PROJECT TRIP GENERATION

In determining project trip generation, the magnitude of traffic entering and exiting the site is estimated for the a.m. and p.m. peak hours. In order to accurately estimate the unique trip generation characteristics of the proposed development, TJKM used data from the Dublin Transit Center Draft EIR (*July 2001 Appendix 8.7 Traffic report Table 3 on page 27*). Trip generation rates were derived for weekday a.m. and p.m. peak hours. The proposed development of 570 new parking stalls is expected to generate 308 trips (268 inbound and 40 outbound) during the a.m. peak hour and 245 trips (73 inbound and 172 outbound) during the p.m. peak hour of the proposed parking garage. **Table 8** shows the expected trip generation for the proposed project.

PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

As part of the project trip distribution, an estimate is made of the directions to and from which the project trips would travel. In the project trip assignment, the project trips are assigned to specific streets and intersections. The directional distribution of site-generated traffic to and from the project area was developed based on the existing Dublin/Pleasanton Station Home-origin survey. The peak hour trips generated by the proposed uses were assigned to the roadway system at each study location.

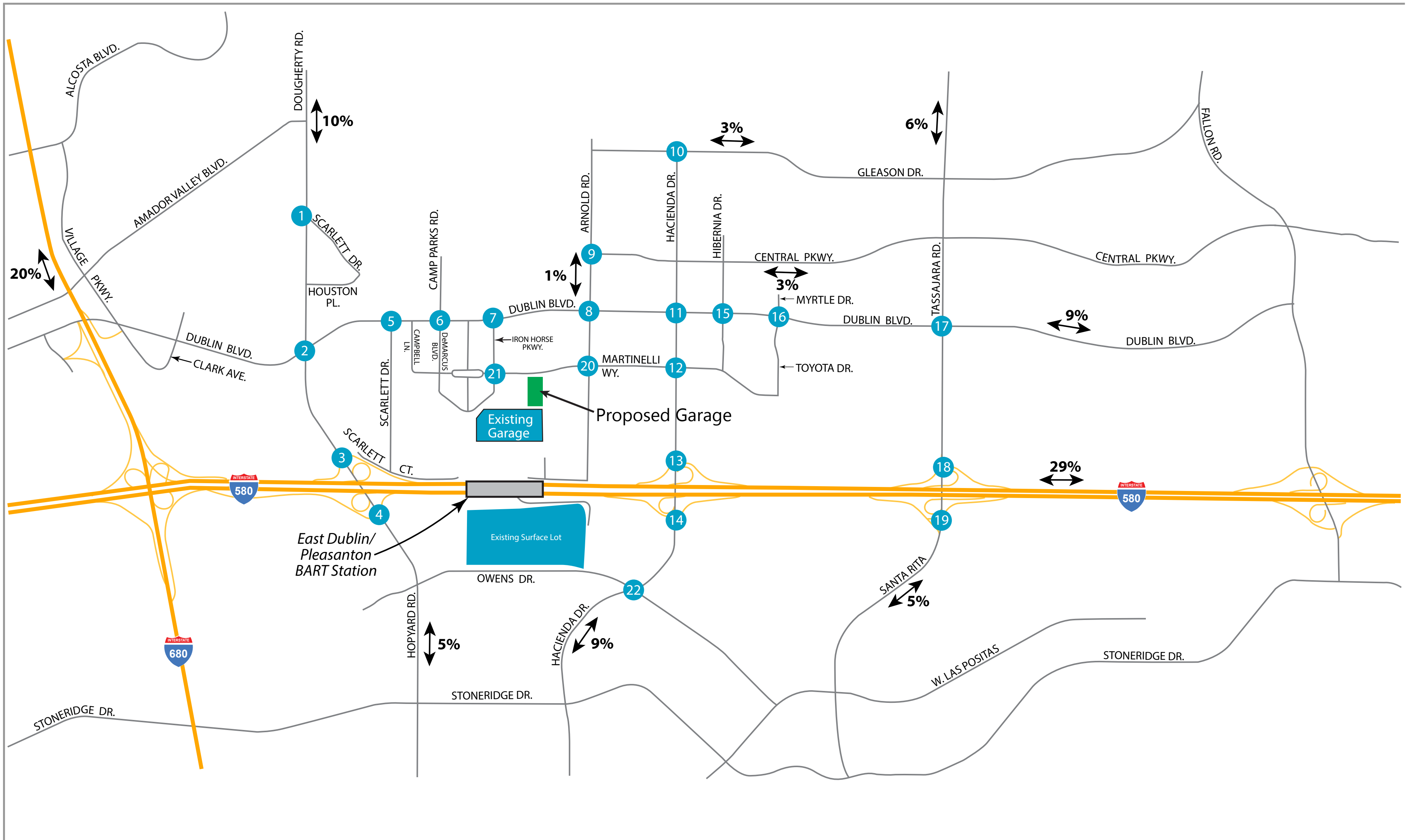
Figure 8 illustrates the trip distribution percentages developed for the proposed project. **Figure 9** shows the net new project trips assigned to each turning movements by intersection by the proposed project under Existing plus Project Conditions. The assigned project trips were then added to traffic volumes under Existing Conditions to generate Existing plus Project Conditions traffic volumes.

Table 8: Project Trip Generation

Land Use	Parking Spaces	Daily		A.M. Peak Hour					P.M. Peak Hour				
		Rate	Trips	Rate	In : Out %	In Trips	Out Trips	Total Trips	Rate	In: Out %	In Trips	Out Trips	Total Trips
Parking Garage	570	3.47	1,874	0.54	87:13	268	40	308	0.43	30:70	73	172	245
Net New Trips			**1,874**			**268**	**40**	**308**			**73**	**172**	**245**

Source: Trip generation rates obtained from Dublin Transit Center Draft EIR July 2001 Appendix 8.7 Traffic report, Table 3 on page 27

Project Trip Distribution



LEGEND

X Study Intersection

XX% Trip Distribution

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Figure 8

Project Trips Assignment for Existing with Project Conditions

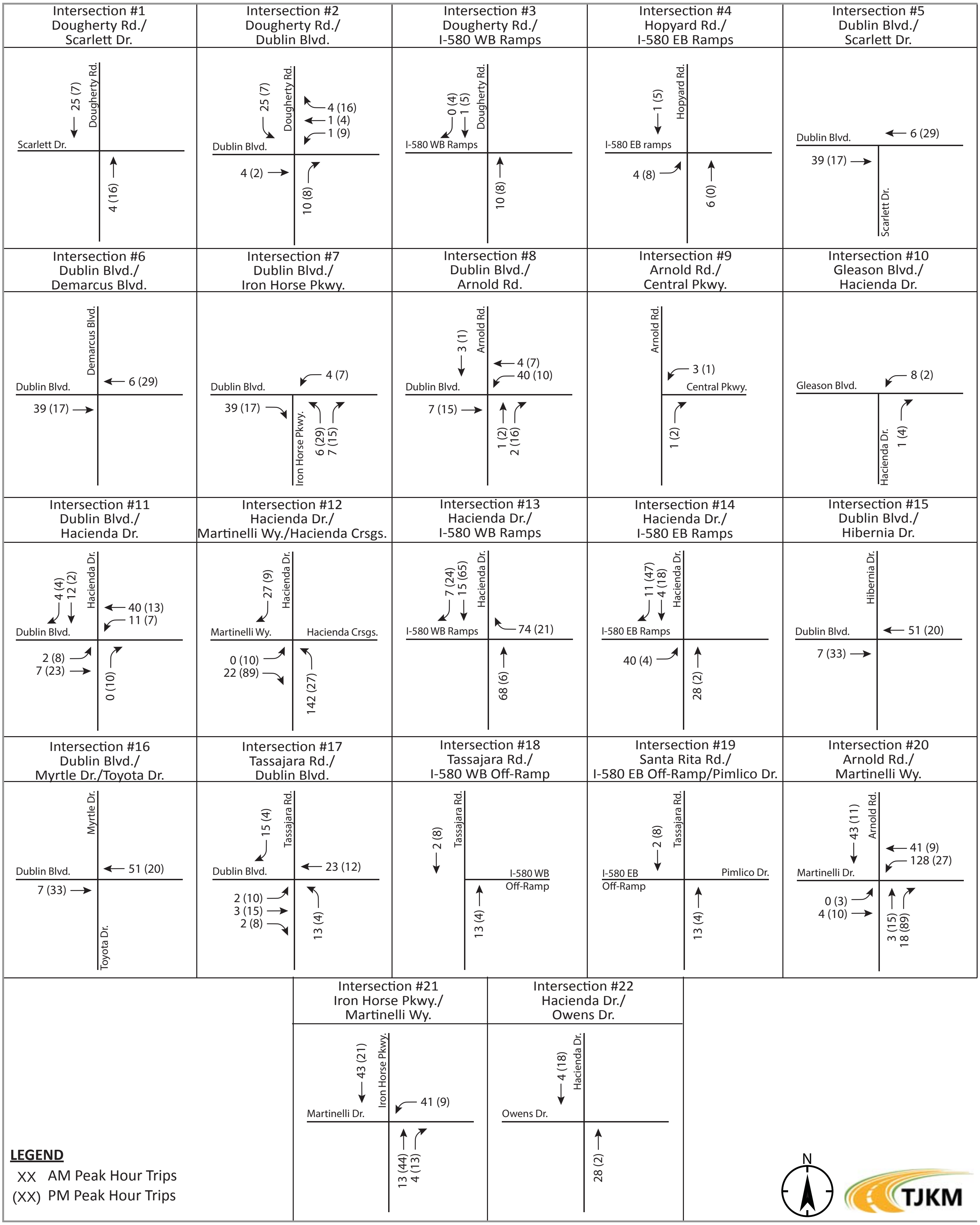

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Figure 9

INTERSECTION LEVEL OF SERVICE ANALYSIS – EXISTING WITH PROJECT CONDITIONS

The intersection LOS analysis results for Existing plus Project Conditions are summarized in **Table 9**. Detailed calculation sheets for Existing plus Project Conditions are contained in **Appendix C**. Under this scenario, all the study intersections operate at overall acceptable service levels in accordance with benchmarks set by the Dublin and Pleasanton during both the morning and evening peak hours. Based on the impact criteria, the project is expected to have a *less-than-significant* impact at all the study intersections.

Traffic signal timings, peak hour factors and heavy vehicle percentages at the study intersections were left unchanged from existing conditions. **Figure 10** shows projected turning movement volumes at the study intersection for Existing plus Project Conditions. Under this scenario, all the intersections operate within the standards of the City of Dublin and Pleasanton during the a.m. and p.m. peak hours except for the intersection of Dougherty Road and Dublin Boulevard (Int. # 2) which operates at LOS E with a delay of 57.5 seconds in the p.m. peak hour. Based on the city of Dublin level of service impact criteria, if the intersection is already operating at unacceptable operations (i.e., LOS E or LOS F) under no project conditions, and the project adds 50 or more peak hour trips, it is considered to be a significant impact. The project is adding less than 50 trips at the intersection of Dougherty Road / Dublin Boulevard in the a.m. and p.m. peak hours; therefore the project is expected to have less-than-significant impacts at all the study intersections under Existing plus Project Conditions.

The results for Existing Conditions are included for comparison purposes, along with the projected increases in control delay. It should be noted that some of the study intersections are estimated to show a negative net increase in intersection delay due to the addition of project trips to non-critical turn movements.

Table 9: Existing with Project Conditions Intersection Level of Service Analysis

No	Intersections	Control	Peak Hour[1]	Existing Conditions		Existing with Project Conditions		Change In Delay[4] (Sec)
				Delay[2]	LOS[3]	Delay[2]	LOS[3]	
1	Dougherty Road / Scarlett Drive	Signalized	AM	10.8	B	10.9	B	0.1
			PM	14.0	B	14.2	B	0.2
2	Dougherty Road / Dublin Boulevard	Signalized	AM	35.9	D	36.0	D	0.1
			PM	**55.8**	**E**	**57.5**	**E**	1.7
3	Dougherty Road / Westbound I-580 Ramps	Signalized	AM	12.0	B	12.0	B	0.0
			PM	11.2	B	11.2	B	0.0
4	Hopyard Road / Eastbound I-580 Ramps	Signalized	AM	46.1	D	46.0	D	-0.1
			PM	41.6	D	42.3	D	0.7
5	Dublin Boulevard / Scarlett Drive	Signalized	AM	9.9	A	9.9	A	0.0
			PM	11.0	B	11.0	B	0.0
6	Dublin Boulevard / Demarcus Boulevard	Signalized	AM	12.7	B	12.6	B	-0.1
			PM	8.4	A	8.3	A	-0.1
7	Dublin Boulevard / Iron Horse Parkway	Signalized	AM	15.0	B	16.0	B	1.0
			PM	12.0	B	13.0	B	1.0
8	Dublin Boulevard / Arnold Road	Signalized	AM	36.4	D	37.2	D	0.8
			PM	28.0	C	27.9	C	-0.1
9	Arnold Road / Central Parkway	Signalized	AM	6.7	A	6.8	A	0.1
			PM	8.9	A	8.9	A	0.0
10	Gleason Boulevard / Hacienda Drive	Signalized	AM	15.5	B	15.6	B	0.1
			PM	10.0	A	10.0	A	0.0
11	Dublin Boulevard / Hacienda Drive	Signalized	AM	39.4	D	39.2	D	-0.2
			PM	39.4	D	39.5	D	0.1
12	Hacienda Drive / Martinelli Way-Hacienda Crossings	Signalized	AM	27.7	C	30.3	C	2.6
			PM	42.8	D	43.0	D	0.2
13	Hacienda Drive / Westbound I-580 Ramps	Signalized	AM	5.5	A	5.6	A	0.1
			PM	4.6	A	4.7	A	0.1
14	Hacienda Drive / Eastbound I-580 Ramps	Signalized	AM	8.8	A	8.8	A	0
			PM	9.4	A	9.5	A	0.1
15	Dublin Boulevard/ Hibernia Drive	Signalized	AM	16.8	B	16.5	B	-0.3
			PM	25.6	C	25.5	C	-0.1
16	Dublin Boulevard / Myrtle Drive / Toyota Drive	Signalized	AM	10.8	B	10.6	B	-0.2
			PM	15.7	B	15.5	B	-0.2
17	Tassajara Road/ Dublin Blvd.	Signalized	AM	34.5	C	35.0	C	0.5
			PM	40.6	D	40.9	D	0.3
18	Tassajara Road / Westbound I-580 Off Ramp	Signalized	AM	6.9	A	7.0	A	0.1
			PM	8.3	A	8.3	A	0.0
19	Santa Rita Road / Eastbound I-580 Off Ramp-Pimlico Drive	Signalized	AM	43.5	D	43.7	D	0.2
			PM	51.1	D	51.3	D	0.2

20	Arnold Road / Martinelli Way	Signalized	AM	32.4	C	49.3	D	16.9
			PM	23.5	C	23.9	C	0.4
21	Iron Horse Parkway / Martinelli Way	All-Way Stop	AM	13.7	B	17.7	C	4.0
			PM	11.1	B	12.3	B	1.2
22	Hacienda Drive / Owens Drive	Signalized	AM	15.8	B	15.9	B	0.1
			PM	33.8	C	33.7	C	-0.1

[1]AM – morning peak hour, PM – evening peak hour
[2]Delay – Whole intersection weighted average control delay expressed in seconds per vehicle for signalized and all-way stop controlled intersections.
[3]LOS – Level of Service. LOS calculations conducted using the Synchro 9 level of service analysis software package, which applies the method described in the 2000 Highway Capacity Manual.
[4]Change in average delay between Existing and Existing with Project Conditions
Bold text indicates intersection operates at a deficient level of service.

Existing with Project Conditions Peak Hour Traffic Volumes

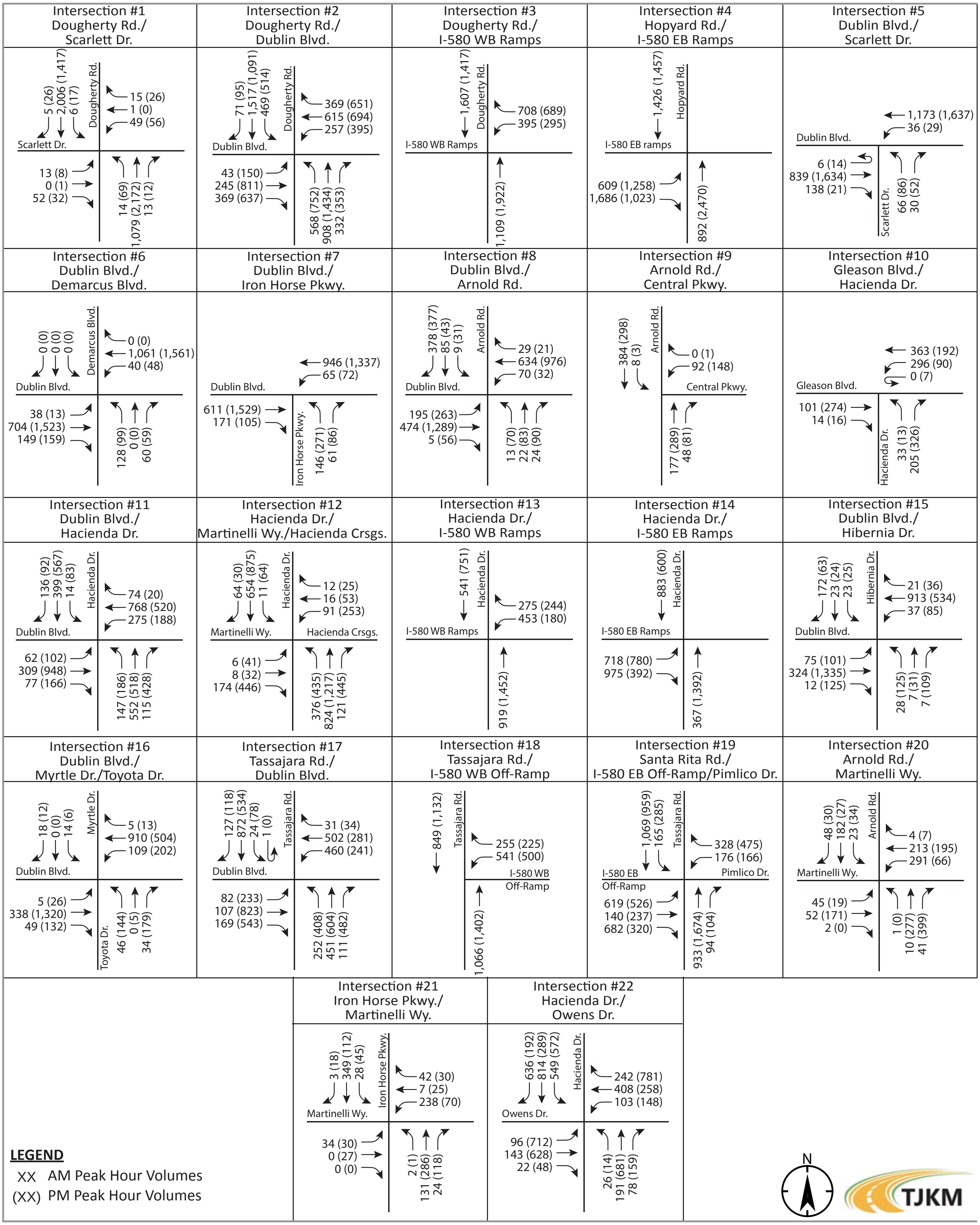

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Figure 10

Freeway and Roadway Segment Analysis – Existing with Project Conditions

Tables 10 and **11** summarize peak hour levels of service at the study roadway segments under Existing plus Project Conditions. Under this scenario, all the roadway segments operate at LOS E or better during the a.m. and p.m. peak hours except the roadway segment on Dublin Boulevard east of Tassajara Road with LOS F in the p.m. peak hour.

Based on the City of Dublin impact criteria the project is expected to have *less-than-significant* impact at all the study roadway segments under Existing with Project Conditions.

Tables 12 and **13** summarize peak hour levels of service at the study freeway segments under Existing with Project Conditions. Under this scenario, all the freeway segments operate at LOS E or better during the a.m. and p.m. peak hours. The project is expected to have *less-than-significant* impact at all the freeway segments under Existing with Project Conditions.

Table 10: Existing with Project Conditions MTS Roadway Segment Level of Service Analysis for AM Peak Hour

No	Study Segments	Direction	# Lanes	No Project Volume AM Peak Hour	Project Volumes AM Peak Hour	With Project Volume	V/C[1] Ratio No Project	V/C[1] Ratio plus Project	No Project LOS[2]	Plus Project LOS[2]	Change from LOS E or better to LOS F	LOS F and Change in V/C > 0.02
1	Dougherty Road North of Scarlett Drive	Northbound	2	396	4	400	0.18	0.18	A	A	No	No
		Southbound	2	1,467	25	1,492	0.67	0.68	B	B	No	No
2	Dougherty Road between Scarlett Drive and Dublin Boulevard	Northbound	3	396	4	400	0.12	0.12	A	A	No	No
		Southbound	2	1,471	25	1,496	0.67	0.68	B	B	No	No
3	Dougherty Road between Dublin Boulevard and Interstate 580	Northbound	3	1,992	10	2,002	0.60	0.61	A	B	No	No
		Southbound	3	1,669	1	1,670	0.51	0.51	A	A	No	No
4	Dougherty Road between Interstate 580 Eastbound and Westbound ramps	Northbound	8	1,495	10	1,505	0.17	0.17	A	A	No	No
		Southbound	4	1,498	1	1,499	0.34	0.34	A	A	No	No
5	Hopyard Road between Interstate 580 Eastbound ramps and Owens Drive	Northbound	3	923	6	929	0.28	0.28	A	A	No	No
		Southbound	3	1,139	1	1,140	0.35	0.35	A	A	No	No
6	Dublin Boulevard west of Dougherty Road	Eastbound	5	692	4	696	0.13	0.13	A	A	No	No
		Westbound	3	1,930	1	1,931	0.58	0.59	A	A	No	No
7	Dublin Boulevard between Dougherty Road and Scarlett Drive	Eastbound	3	736	39	775	0.22	0.23	A	A	No	No
		Westbound	3	1,015	6	1,021	0.31	0.31	A	A	No	No
8	Dublin Boulevard between Scarlett Drive and DeMarcus Boulevard	Eastbound	3	744	39	783	0.23	0.24	A	A	No	No
		Westbound	3	1,035	6	1,041	0.31	0.32	A	A	No	No
9	Dublin Boulevard between DeMarcus Boulevard and Iron Horse Parkway	Eastbound	3	428	39	467	0.13	0.14	A	A	No	No
		Westbound	3	1,089	6	1,095	0.33	0.33	A	A	No	No
10	Dublin Boulevard between Iron Horse Parkway and Arnold Road	Eastbound	3	215	7	222	0.07	0.07	A	A	No	No
		Westbound	3	1,726	4	1,730	0.52	0.52	A	A	No	No
11	Dublin Boulevard between Arnold Road and Hacienda Drive	Eastbound	3	137	9	146	0.04	0.04	A	A	No	No
		Westbound	3	1,765	44	1,809	0.53	0.55	C	C	No	No
12		Eastbound	4	88	51	139	0.02	0.03	A	A	No	No

	Dublin Boulevard between Hacienda Drive and Hibernia Drive	Westbound	3	1,837	7	1,844	0.56	0.56	C	C	No	No
13	Dublin Boulevard between Hibernia Drive and Toyota Drive	Eastbound	3	122	51	173	0.04	0.05	A	A	No	No
		Westbound	3	1,796	7	1,803	0.54	0.55	A	A	No	No
14	Dublin Boulevard between Toyota Drive and Tassajara Road	Eastbound	3	122	51	173	0.04	0.05	A	A	No	No
		Westbound	3	1,799	7	1,806	0.55	0.55	A	A	No	No
15	Dublin Boulevard east of Tassajara Road	Eastbound	2	78	3	81	0.04	0.04	A	A	No	No
		Westbound	2	1,882	23	1,905	0.86	0.87	D	D	No	No
16	Tassajara Road North of Dublin Boulevard	Northbound	2	202	2	204	0.09	0.09	A	A	No	No
		Southbound	3	706	15	721	0.21	0.22	A	A	No	No
17	Tassajara Road between Dublin Boulevard and Interstate I 580 WB on-off ramps	Northbound	3	366	13	379	0.11	0.11	A	A	No	No
		Southbound	4	1,079	2	1,081	0.25	0.25	A	A	No	No
18	Tassajara Road between Interstate I 580 WB on-off ramps and Pimlico Drive	Northbound	3	505	13	518	0.15	0.16	A	A	No	No
		Southbound	3	1,281	2	1,283	0.39	0.39	A	A	No	No
19	Santa Rita Road between Pimlico Drive and Las Positas Boulevard	Northbound	3	918	13	931	0.28	0.28	A	A	No	No
		Southbound	3	1,296	2	1,298	0.39	0.39	A	A	No	No

Notes:
[1] V/C – Volume to Capacity ratio
[2] LOS – Level of Service

Table 11: Existing with Project Conditions MTS Roadway Segment Level of Service Analysis for PM Peak Hour

No	Study Segments	Direction	# Lanes	No Project Volume AM Peak Hour	Project Volumes AM Peak Hour	With Project Volume	V/C[1] Ratio No Project	V/C[1] Ratio plus Project	No Project LOS[2]	Plus Project LOS[2]	Change from LOS E or better to LOS F	LOS F and Change in V/C > 0.02
1	Dougherty Road North of Scarlett Drive	Northbound	2	2,103	16	2,119	0.96	0.96	E	E	No	No
		Southbound	2	595	7	602	0.27	0.27	A	A	No	No
2	Dougherty Road between Scarlett Drive and Dublin Boulevard	Northbound	3	2,103	16	2,119	0.64	0.64	B	B	No	No
		Southbound	2	595	7	602	0.27	0.27	A	A	No	No
3	Dougherty Road between Dublin Boulevard and Interstate 580	Northbound	3	2,895	8	2,903	0.88	0.88	D	D	No	No
		Southbound	3	1,364	9	1,373	0.41	0.42	A	A	No	No
4	Dougherty Road between Interstate 580 Eastbound and Westbound ramps	Northbound	8	2,185	8	2,193	0.25	0.25	A	A	No	No
		Southbound	4	1,058	5	1,063	0.24	0.24	A	A	No	No
5	Hopyard Road between Interstate 580 Eastbound ramps and Owens Drive	Northbound	3	1,320	0	1,320	0.40	0.40	A	A	No	No
		Southbound	3	934	5	939	0.28	0.28	A	A	No	No
6	Dublin Boulevard west of Dougherty Road	Eastbound	5	630	2	632	0.11	0.11	A	A	No	No
		Westbound	3	1,389	4	1,393	0.42	0.42	A	A	No	No
7	Dublin Boulevard between Dougherty Road and Scarlett Drive	Eastbound	3	661	17	678	0.20	0.21	A	A	No	No
		Westbound	3	1,131	29	1,160	0.34	0.35	A	A	No	No
8	Dublin Boulevard between Scarlett Drive and DeMarcus Boulevard	Eastbound	3	684	17	701	0.21	0.21	A	A	No	No
		Westbound	3	1,144	29	1,173	0.35	0.36	A	A	No	No
9	Dublin Boulevard between DeMarcus Boulevard and Iron Horse Parkway	Eastbound	3	804	17	821	0.24	0.25	A	A	No	No
		Westbound	3	667	29	696	0.20	0.21	A	A	No	No
10	Dublin Boulevard between Iron Horse Parkway and Arnold Road	Eastbound	3	1,572	15	1,587	0.48	0.48	A	A	No	No
		Westbound	3	286	7	293	0.09	0.09	A	A	No	No
11	Dublin Boulevard between Arnold Road and Hacienda Drive	Eastbound	3	1,682	31	1,713	0.51	0.52	A	A	No	No
		Westbound	3	178	17	195	0.05	0.06	A	A	No	No

No	Study Segments	Direction	# Lanes	No Project Volume AM Peak Hour	Project Volumes AM Peak Hour	With Project Volume	V/C[1] Ratio No Project	V/C[1] Ratio plus Project	No Project LOS[2]	Plus Project LOS[2]	Change from LOS E or better to LOS F	LOS F and Change in V/C > 0.02
12	Dublin Boulevard between Hacienda Drive and Hibernia Drive	Eastbound	4	2,126	33	2,159	0.48	0.49	A	A	No	No
		Westbound	3	104	20	124	0.03	0.04	A	A	No	No
13	Dublin Boulevard between Hibernia Drive and Toyota Drive	Eastbound	3	2,112	33	2,145	0.64	0.65	B	B	No	No
		Westbound	3	120	20	140	0.04	0.04	A	A	No	No
14	Dublin Boulevard between Toyota Drive and Tassajara Road	Eastbound	3	2,118	33	2,151	0.64	0.65	B	B	No	No
		Westbound	3	119	20	139	0.04	0.04	A	A	No	No
15	Dublin Boulevard east of Tassajara Road	Eastbound	2	2,256	15	2,271	**1.03**	**1.03**	**F**	**F**	No	No
		Westbound	2	121	12	133	0.06	0.06	A	A	No	No
16	Tassajara Road North of Dublin Boulevard	Northbound	2	786	10	796	0.36	0.36	A	A	No	No
		Southbound	3	355	4	359	0.11	0.11	A	A	No	No
17	Tassajara Road between Dublin Boulevard and Interstate I 580 WB on-off ramps	Northbound	3	1,322	4	1,326	0.40	0.40	A	A	No	No
		Southbound	4	706	8	714	0.16	0.16	A	A	No	No
18	Tassajara Road between Interstate I 580 WB on-off ramps and Pimlico Drive	Northbound	3	1,404	4	1,408	0.43	0.43	A	A	No	No
		Southbound	3	1,253	8	1,261	0.38	0.38	A	A	No	No
19	Santa Rita Road between Pimlico Drive and Las Positas Boulevard	Northbound	3	1,473	4	1,477	0.45	0.45	A	A	No	No
		Southbound	3	1,195	8	1,203	0.36	0.36	A	A	No	No

Notes:
[1] V/C – Volume to Capacity ratio
[2]LOS – Level of Service

Table 12: Existing with Project Conditions MTS Freeway Segment Level of Service Analysis – AM Peak Hour

No	Study Segments	Direction	# Lanes	No Project Volume AM Peak Hour	Project Volumes AM Peak Hour	With Project Volume	V/C[1] Ratio No Project	V/C[1] Ratio plus Project	No Project LOS[2]	Plus Project LOS[2]	Change from LOS E or better to LOS F	LOS F and Change in V/C > 0.02
1	I-680 between Alcosta Boulevard and I 580 ramps	Northbound	5	6,120	8	6,128	0.58	0.58	A	A	No	No
		Southbound	5	5,693	51	5,744	0.54	0.55	A	A	No	No
2	I-680 between I 580 ramps and Stoneridge Drive	Northbound	4	4,692	0	4,692	0.56	0.56	A	A	No	No
		Southbound	4	6,081	0	6,081	0.72	0.72	C	C	No	No
3	I -580 between I -680 ramps and Hopyard Road	Eastbound	6	4,081	40	4,121	0.32	0.33	A	A	No	No
		Westbound	6	8,517	7	8,524	0.68	0.68	B	B	No	No
4	I -580 between Hopyard Road and Hacienda Drive	Eastbound	6	4,674	11	4,675	0.37	0.37	A	A	No	No
		Westbound	6	9,708	74	9,782	0.77	0.78	C	C	No	No
5	I -580 between Hacienda Drive and Santa Rita Drive	Eastbound	6	4,432	11	4,443	0.35	0.35	A	A	No	No
		Westbound	6	9,988	74	10,062	0.79	0.80	C	C	No	No
6	I -580 between Santa Rita Drive and Fallon Road	Eastbound	6	4,868	11	4,879	0.39	0.39	A	A	No	No
		Westbound	6	10,113	74	10,187	0.80	0.81	C	D	No	No

Notes:
[1] V/C – Volume to Capacity ratio
[2] LOS – Level of Service

Table 13: Existing with Project Conditions MTS Freeway Segment Level of Service Analysis – PM Peak Hour

No	Study Segments	Direction	# Lanes	No Project Volume AM Peak Hour	Project Volumes AM Peak Hour	With Project Volume	V/C[1] Ratio No Project	V/C[1] Ratio plus Project	No Project LOS[2]	Plus Project LOS[2]	Change from LOS E or better to LOS F	LOS F and Change in V/C > 0.02
1	I-680 between Alcosta Boulevard and I 580 ramps	Northbound	5	5,861	32	5,893	0.56	0.56	A	A	No	No
		Southbound	5	6,723	14	6,737	0.64	0.64	B	B	No	No
2	I-680 between I 580 ramps and Stoneridge Drive	Northbound	4	5,369	0	5,369	0.64	0.64	B	B	No	No
		Southbound	4	4,704	0	4,704	0.56	0.56	A	A	No	No
3	I -580 between I -680 ramps and Hopyard Road	Eastbound	6	9,952	4	9,956	0.79	0.79	C	C	No	No
		Westbound	6	4,918	24	4,942	0.39	0.39	A	A	No	No
4	I -580 between Hopyard Road and Hacienda Drive	Eastbound	6	10,550	47	10,597	0.84	0.84	D	D	No	No
		Westbound	6	6,222	21	6,243	0.49	0.50	A	A	No	No
5	I -580 between Hopyard Road and Santa Rita Drive	Eastbound	6	9,707	47	9,754	0.77	0.77	C	C	No	No
		Westbound	6	6,178	21	6,199	0.49	0.49	A	A	No	No
6	I -580 between Santa Rita Drive and Fallon Road	Eastbound	6	9,786	47	9,833	0.78	0.78	C	C	No	No
		Westbound	6	6,579	21	6,600	0.52	0.52	A	A	No	No

Notes:
[1] V/C – Volume to Capacity ratio
[2] LOS – Level of Service

NEAR-TERM WITHOUT PROJECT CONDITIONS

This chapter presents the traffic conditions at all study intersections under Near-Term (No Project) Conditions. This analysis scenario is defined as Near-Term conditions without the proposed project in year 2025. Traffic volumes for Near-Term without Project conditions comprise existing volumes plus traffic generated by approved but not yet constructed and occupied developments in the area. Traffic volumes for the Near-Term condition were developed through the use of the updated City of Dublin Travel Demand Model. The forecasts represent likely traffic conditions in the area over the next ten years.

Heavy vehicle percentages at the study intersections were left unchanged from existing conditions. Peak hour factors were adjusted reflecting that as traffic volumes increase, peak hour factors tend to increase and traffic starts to arrive more uniformly throughout the peak hour. Traffic signal timings were optimized at some intersections to reflect shifts in travel patterns. Planned roadway improvements were accounted for in Level of Service analysis. Traffic volumes and trip assignment for the Near-Term without project conditions scenario obtained from the travel demand model were adjusted to reflect reasonable routing. Intersection turning movement volumes for the Near-Term without project were refined to reflect intersection-specific constraints. **Figure 11** illustrates the Near-Term Conditions lane geometry and traffic control at all the study intersections.

INTERSECTIONS LEVEL OF SERVICE ANALYSIS – NEAR-TERM CONDITIONS

The intersection LOS analysis results for Near-Term without Project Conditions are summarized in **Table 14**. Detailed calculation sheets for Near-Term without Project Conditions are contained in **Appendix D**. Under this scenario, all the intersections operate within the standards of the cities of Dublin and Pleasanton during the a.m. and p.m. peak hours except at the intersection of Dougherty Road and Dublin Boulevard (Int. # 2) which operates at LOS E with a delay of 63.0 seconds in the p.m. peak hour.

Figure 12 shows turning movement volumes at all the study intersections for Near-Term without Project Conditions.

Table 14: Near-Term without Project Conditions Intersection Level of Service Analysis

ID	Study Intersections	Control	Near-Term without Project Conditions			
			AM Peak[1]		PM Peak[1]	
			Delay[2]	LOS[3]	Delay[2]	LOS[3]
1	Dougherty Road and Scarlett Drive	Signalized	23.7	C	30.1	C
2	Dougherty Road and Dublin Boulevard	Signalized	38.5	D	**63.0**	**E**
3	Dougherty Road and Westbound I-580 Ramps	Signalized	14.8	B	14.4	B
4	Hopyard Road and Eastbound I-580 Ramps	Signalized	53.1	D	52.8	D
5	Dublin Boulevard and Scarlett Drive	Signalized	37.9	D	29.4	C
6	Dublin Boulevard and Demarcus Boulevard	Signalized	14.3	B	10.8	B
7	Dublin Boulevard and Iron Horse Parkway	Signalized	10.9	B	32.0	C
8	Dublin Boulevard and Arnold Road	Signalized	38.2	D	45.3	D
9	Arnold Road and Central Parkway	Signalized	14.9	B	14.5	B
10	Gleason Boulevard and Hacienda Drive	Signalized	15.5	B	9.9	A
11	Dublin Boulevard and Hacienda Drive	Signalized	36.2	D	40.2	D
12	Hacienda Drive and Martinelli Way /Hacienda Crossings	Signalized	31.7	C	45.5	D
13	Hacienda Drive and Westbound I-580 Ramps	Signalized	6.7	A	10.3	B
14	Hacienda Drive and Eastbound I-580 Ramps	Signalized	10.7	B	12.7	B
15	Dublin Boulevard and Hibernia Drive	Signalized	17.0	B	28.1	C
16	Dublin Boulevard and Myrtle Drive/Toyota Drive	Signalized	10.5	B	20.1	C
17	Tassajara Road and Dublin Boulevard	Signalized	32.5	C	42.8	D
18	Tassajara Road and Westbound I-580 Off Ramp	Signalized	6.7	A	11.4	B
19	Santa Rita Road and Eastbound I-580 Off Ramp/Pimlico Drive	Signalized	46.9	D	52.1	D
20	Arnold Road and Martinelli Way	Signalized	32.9	C	47.9	D
21	Iron Horse Parkway and Martinelli Way	All-Way Stop	18.8	C	14.1	B
22	Hacienda Drive and Owens Drive	Signalized	18.6	B	47.7	D

Notes:
[1]AM – morning peak hour, PM – evening peak hour
[2]Delay – Whole intersection weighted average control delay expressed in seconds per vehicle for signalized and all-way stop controlled intersections.
[3]LOS – Level of Service. LOS calculations conducted using the Synchro 9 level of service analysis software package, which applies the method described in the 2000 Highway Capacity Manual.
Bold text indicates intersection operates at a deficient level of service.

Near-term Conditions Lane Geometry and Traffic Controls

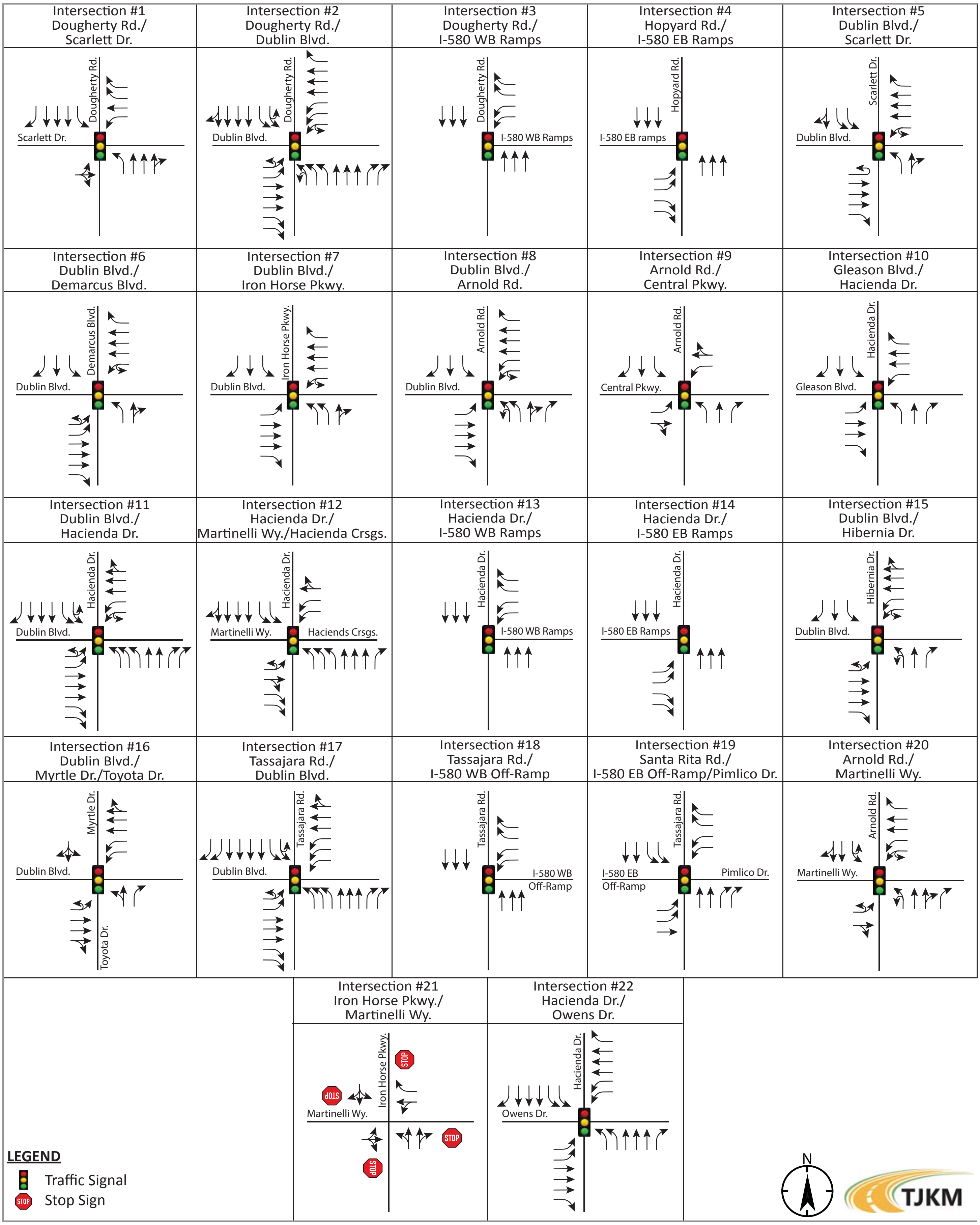

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Figure 11

Near-Term without Project Conditions Peak Hour Traffic Volumes

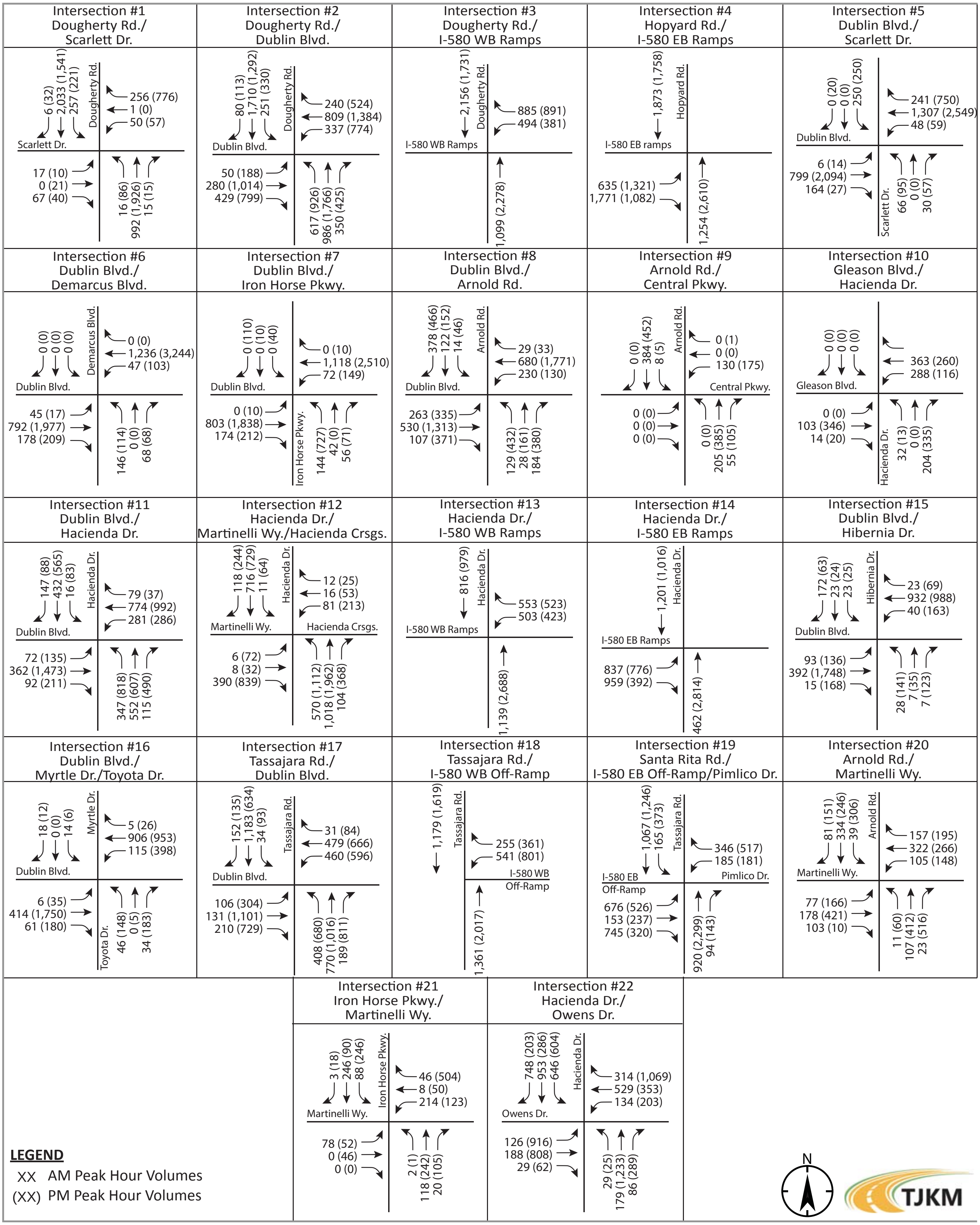

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Figure 12

FREEWAY AND ROADWAY SEGMENT ANALYSIS – NEAR-TERM CONDITIONS

Table 15 summarizes peak hour levels of service at the study roadway segments under Near-Term Conditions. Under this scenario, all the roadway segments operate at LOS E or better during the a.m. and p.m. peak hours except Dougherty Road between Dublin Boulevard and Interstate 580 in the northbound direction with LOS F in the p.m. peak hour.

Table 16 summarizes peak hour levels of service at the study freeway segments under Near-Term Conditions. Under this scenario, all the freeway segments operate at LOS E or better during the a.m. and p.m. peak hours.

Table 15: Near -Term without Project Conditions MTS Roadway Segment Level of Service Analysis

No	Study Segments	Direction	# Lanes	AM Peak Hour Volume	PM Peak Hour Volume	AM Peak Hour V/C[1] Ratio	PM Peak Hour V/C[1] Ratio	AM Peak Hour LOS[2]	PM Peak Hour LOS[2]
1	Dougherty Road North of Scarlett Drive	Northbound	3	616	2,998	0.19	0.91	A	E
		Southbound	3	2,308	756	0.70	0.23	C	A
2	Dougherty Road between Scarlett Drive and Dublin Boulevard	Northbound	3	593	2,889	0.18	0.88	A	D
		Southbound	3	2,267	718	0.69	0.22	B	A
3	Dougherty Road between Dublin Boulevard and Interstate 580	Northbound	3	2,173	3,326	0.66	**1.01**	B	**F**
		Southbound	3	2,486	1,689	0.75	0.51	C	A
4	Dougherty Road between Interstate 580 Eastbound and Westbound ramps	Northbound	8	1,870	2,761	0.21	0.31	A	A
		Southbound	4	2,124	1,304	0.48	0.30	A	A
5	Hopyard Road between Interstate 580 Eastbound ramps and Owens Drive	Northbound	3	1,149	1,857	0.35	0.56	A	A
		Southbound	3	1,544	1,234	0.47	0.37	A	A
6	Dublin Boulevard west of Dougherty Road	Eastbound	5	1,075	942	0.20	0.17	A	A
		Westbound	3	2,510	1,711	0.76	0.52	C	A
7	Dublin Boulevard between Dougherty Road and Scarlett Drive	Eastbound	3	1,323	1,122	0.40	0.34	A	A
		Westbound	3	1,779	2,176	0.54	0.66	A	B
8	Dublin Boulevard between Scarlett Drive and DeMarcus Boulevard	Eastbound	3	1,360	1,191	0.41	0.36	A	A
		Westbound	3	1,840	2,310	0.56	0.70	A	C
9	Dublin Boulevard between DeMarcus Boulevard and Iron Horse Parkway	Eastbound	3	928	1,528	0.28	0.46	A	A
		Westbound	3	1,997	1,605	0.61	0.49	B	A
10	Dublin Boulevard between Iron Horse Parkway and Arnold Road	Eastbound	3	374	2,506	0.11	0.76	A	C
		Westbound	3	2,620	826	0.79	0.25	C	A
11	Dublin Boulevard between Arnold Road and Hacienda Drive	Eastbound	3	245	2,821	0.07	0.85	A	D
		Westbound	3	2,697	520	0.82	0.16	D	A
12	Dublin Boulevard between Hacienda Drive and Hibernia Drive	Eastbound	4	151	3,226	0.03	0.73	A	C
		Westbound	3	2,731	247	0.83	0.07	D	A

13	Dublin Boulevard between Hibernia Drive and Toyota Drive	Eastbound	3	167	3,225	0.05	0.98	A	E
		Westbound	3	2,717	251	0.82	0.08	D	A
14	Dublin Boulevard between Toyota Drive and Tassajara Road	Eastbound	3	162	3,237	0.05	0.98	A	E
		Westbound	3	2,728	247	0.83	0.07	D	A
15	Dublin Boulevard east of Tassajara Road	Eastbound	3	176	3,116	0.05	0.94	A	E
		Westbound	3	2,758	243	0.84	0.07	D	A
16	Tassajara Road North of Dublin Boulevard	Northbound	2	222	903	0.10	0.41	A	A
		Southbound	3	693	472	0.21	0.14	A	A
17	Tassajara Road between Dublin Boulevard and Interstate I 580 WB on-off ramps	Northbound	3	550	1,367	0.17	0.41	A	A
		Southbound	4	1,099	1,010	0.25	0.23	A	A
18	Tassajara Road between Interstate I 580 WB on-off ramps and Pimlico Drive	Northbound	3	612	1,430	0.19	0.43	A	A
		Southbound	3	1,235	1,582	0.37	0.48	A	A
19	Santa Rita Road between Pimlico Drive and Las Positas Boulevard	Northbound	3	900	1,646	0.27	0.50	A	A
		Southbound	3	1,315	1,249	0.40	0.38	A	A

Notes:
[1.]V/C – Volume to Capacity ratio
[2]LOS – Level of Service
Bold text indicates intersection operates at a deficient Level of Service.

Table 16: Near-Term without Project Conditions MTS Freeway Segment Level of Service Analysis

No	Study Segments	Direction	# Lanes	AM Peak Hour Volumes	PM Peak Hour Volumes	AM Peak Hour V/C[1] Ratio	PM Peak Hour V/C [1] Ratio	AM Peak Hour LOS[2]	PM Peak Hour LOS[2]
1	I-680 between Alcosta Boulevard and I 580 ramps	Northbound	5	6,895	6,537	0.66	0.62	B	B
		Southbound	5	6,336	7,310	0.60	0.70	A	B
2	I-680 between I 580 ramps and Stoneridge Drive	Northbound	4	5,154	5,562	0.61	0.66	B	B
		Southbound	4	6,375	5,025	0.76	0.60	C	A
3	I -580 between I -680 ramps and Hopyard Road	Eastbound	6	4,879	10,428	0.39	0.83	A	D
		Westbound	6	9,402	5,851	0.75	0.46	C	A
4	I -580 between Hopyard Road and Hacienda Drive	Eastbound	6	5,735	11,077	0.46	0.88	A	D
		Westbound	6	10,321	7,137	0.82	0.57	D	A
5	I -580 between Hacienda Drive and Santa Rita Drive	Eastbound	6	5,535	10,389	0.44	0.82	A	D
		Westbound	6	10,789	7,285	0.86	0.58	D	A
6	I -580 between Santa Rita Drive and Fallon Road	Eastbound	6	5,840	10,827	0.46	0.86	A	D
		Westbound	6	10,981	7,696	0.87	0.61	D	B

Notes:
[1.]V/C – Volume to Capacity ratio
[2]LOS – Level of Service

NEAR-TERM WITH PROJECT CONDITIONS

This scenario is identical to Near-Term Conditions, with the addition of projected traffic from the proposed development of the project. Trip generation and distribution for the proposed project are identical to that assumed under Existing plus Project Conditions. **Figure 13** shows the net new project trips assigned to each turning movements by intersection by the proposed project under Near-Term plus Project Conditions. **Figure 14** shows turning movement volumes at all study intersections for Near-Term with Project Conditions.

INTERSECTION LEVEL OF SERVICE ANALYSIS – NEAR-TERM WITH PROJECT CONDITIONS

The intersection LOS analysis results for Near-Term with Project Conditions are summarized in **Table 17**. Detailed calculation sheets Near-Term are contained in **Appendix E**.

Under this scenario, all the intersections operate within the standards of the cities of Dublin and Pleasanton during the a.m. and p.m. peak hours expect for the intersection of Dougherty Road and Dublin Boulevard (Int. # 2) which operates at LOS E with a delay of 63.2 seconds in the p.m. peak hour. Based on the city of Dublin level of service impact criteria, if the intersection is already operating at unacceptable operations (i.e., LOS E or LOS F) under no project conditions and the project adds 50 or more peak hour trips than it is consider to be a significant impact. The project is adding less than 50 trips, so Near-Term project is expected to have a less-than-significant impact at all the study intersections under Near-Term with Project Conditions.

The results for Near-Term Conditions are included for comparison purposes, along with the projected increases in control delay. It should be noted that some of the study intersections are estimated to show a negative net increase in intersection delay due to the addition of project trips to non-critical turn movements.

Table 17: Near-Term with Project Conditions Intersection Level of Service Analysis

No	Intersections	Control	Peak Hour[1]	Near-Term Conditions		Near–Term with Project Conditions		Change In Delay (Sec)[4]
				Delay[2]	LOS[3]	Delay[2]	LOS[3]	
1	Dougherty Road / Scarlett Drive	Signalized	AM	23.7	C	24.4	C	0.7
			PM	30.1	C	30.7	C	0.6
2	Dougherty Road / Dublin Boulevard	Signalized	AM	38.5	D	38.5	D	0
			PM	**63.0**	**E**	**63.2**	**E**	0.2
3	Dougherty Road / Westbound I-580 Ramps	Signalized	AM	14.8	B	14.8	B	0.0
			PM	14.4	B	14.4	B	0.0
4	Hopyard Road / Eastbound I-580 Ramps	Signalized	AM	53.1	D	53.1	D	0
			PM	52.8	D	52.8	D	0
5	Dublin Boulevard / Scarlett Drive	Signalized	AM	37.9	D	42.8	D	4.9
			PM	29.4	C	30.0	C	0.6
6	Dublin Boulevard / Demarcus Boulevard	Signalized	AM	14.3	B	14.1	B	-0.2
			PM	10.8	B	11.0	B	0.2
7	Dublin Boulevard / Iron Horse Parkway	Signalized	AM	10.9	B	11.0	B	0.1
			PM	32.0	C	34.0	C	2.0
8	Dublin Boulevard / Arnold Road	Signalized	AM	38.2	D	38.8	D	0.6
			PM	45.3	D	45.6	D	0.3
9	Arnold Road / Central Parkway	Signalized	AM	14.9	B	15.1	B	0.2
			PM	14.5	B	14.5	B	0.0
10	Gleason Boulevard / Hacienda Drive	Signalized	AM	15.5	B	15.6	B	0.1
			PM	9.9	A	9.9	A	0
11	Dublin Boulevard / Hacienda Drive	Signalized	AM	36.2	D	35.7	D	-0.5
			PM	40.2	D	41.1	D	0.9
12	Hacienda Drive / Martinelli Way-Hacienda Crossings	Signalized	AM	31.7	C	33.2	C	1.5
			PM	45.5	D	50.0	D	4.5
13	Hacienda Drive / Westbound I-580 Ramps	Signalized	AM	6.7	A	7.2	A	0.5
			PM	10.3	B	10.7	B	0.4
14	Hacienda Drive / Eastbound I-580 Ramps	Signalized	AM	10.7	B	10.7	B	0
			PM	12.7	B	12.7	B	0
15	Dublin Boulevard/ Hibernia Drive	Signalized	AM	17.0	B	16.8	B	-0.2
			PM	28.1	C	28.2	C	0.1
16	Dublin Boulevard / Myrtle Drive / Toyota Drive	Signalized	AM	10.5	B	10.3	B	-0.2
			PM	20.1	C	20.1	C	0
17	Tassajara Road/ Dublin Blvd.	Signalized	AM	32.5	C	32.8	C	0.3
			PM	42.8	D	43.1	D	0.3
18	Tassajara Road / Westbound I-580 Off Ramp	Signalized	AM	6.7	A	6.7	A	0
			PM	11.4	B	11.4	B	0
19	Santa Rita Road / Eastbound	Signalized	AM	46.9	D	47.1	D	0.2

No	Intersections	Control	Peak Hour[1]	Near-Term Conditions		Near–Term with Project Conditions		Change In Delay (Sec)[4]
				Delay[2]	LOS[3]	Delay[2]	LOS[3]	
	I-580 Off Ramp-Pimlico Drive		PM	52.1	D	52.3	D	0.2
20	Arnold Road / Martinelli Way	Signalized	AM	32.9	C	35.0	D	2.1
			PM	47.9	D	49.1	D	1.2
21	Iron Horse Parkway / Martinelli Way	All-Way Stop	AM	18.8	C	25.6	D	6.8
			PM	14.1	B	17.1	C	3.0
22	Hacienda Drive / Owens Drive	Signalized	AM	18.6	B	18.8	B	0.2
			PM	47.7	D	47.6	D	-0.1

[1]AM – morning peak hour, PM – evening peak hour
[2]Delay – Whole intersection weighted average control delay expressed in seconds per vehicle for signalized and all-way stop controlled intersections.
[3]LOS – Level of Service. LOS calculations conducted using the Synchro 9 level of service analysis software package, which applies the method described in the 2000 Highway Capacity Manual.
[4]Change in average delay between Near-Term and Near-Term with Project Conditions
Bold text indicates intersection operates at a deficient level of service.

Project Trip Assignment for Near-Term with Project Conditions

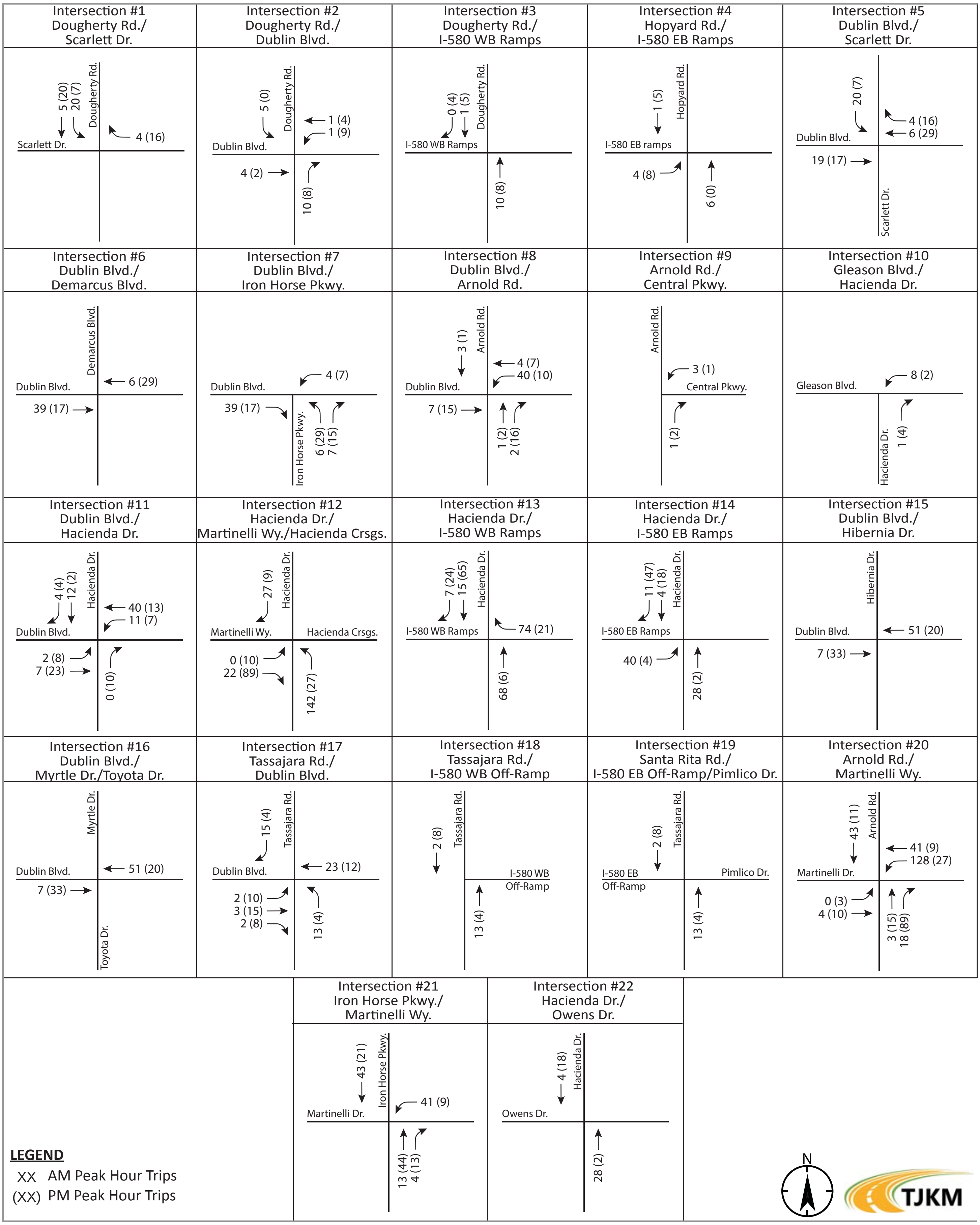

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Figure 13

Near-Term with Project Conditions Peak Hour Traffic Volumes

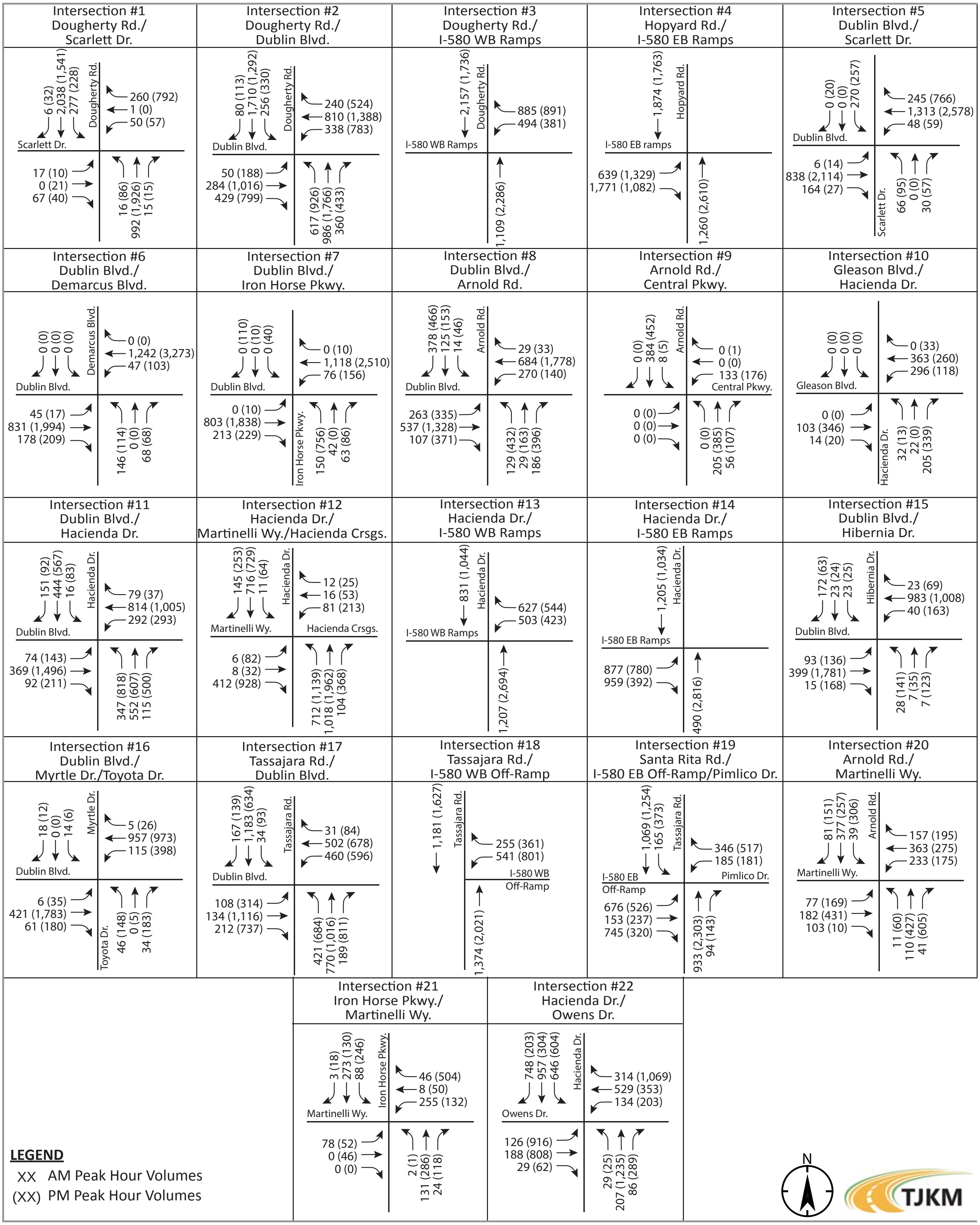

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Figure 14

Freeway and Roadway Segment Analysis – Near - Term with Project Conditions

Tables 18 and **19** summarize peak hour levels of service at the study roadway segments under Near-Term plus Project Conditions. Under this scenario, all the roadway segments operate at LOS E or better during the a.m. and p.m. peak hours expect Dougherty Road between Dublin Boulevard and Interstate 580 in northbound direction with LOS F in the p.m. peak hour.

Based on the City of Dublin and adjacent communities' impact criteria the project is expected to have *less-than-significant* impact at all the study roadway segments under Near-Term with Project Conditions.

Tables 20 and **21** summarize peak hour levels of service at the study freeway segments under Near-Term Conditions. Under this scenario, all the freeway segments operate at LOS E or better during the a.m. and p.m. peak hours.

The project is expected to have a *less-than-significant* impact at all the freeway segments under Near-Term with Project Conditions.

Table 18: Near –Term with Project Conditions MTS Roadway Segment Level of Service Analysis for AM Peak Hour

No	Study Segments	Direction	# Lanes	No Project Volume AM Peak Hour	Project Volumes AM Peak Hour	With Project Volume	V/C[1] Ratio No Project	V/C[1] Ratio plus Project	No Project LOS[2]	Plus Project LOS[2]	Change from LOS E or better to LOS F	LOS F and Change in V/C > 0.02
1	Dougherty Road North of Scarlett Drive	Northbound	3	616	4	620	0.19	0.19	A	A	No	No
		Southbound	3	2,308	20	2,328	0.70	0.71	C	C	No	No
2	Dougherty Road between Scarlett Drive and Dublin Boulevard	Northbound	3	593	0	593	0.18	0.18	A	A	No	No
		Southbound	3	2,267	5	2,272	0.69	0.69	B	B	No	No
3	Dougherty Road between Dublin Boulevard and Interstate 580	Northbound	3	2,173	10	2,183	0.66	0.66	B	B	No	No
		Southbound	3	2,486	1	2,487	0.75	0.75	C	C	No	No
4	Dougherty Road between Interstate 580 Eastbound and Westbound ramps	Northbound	8	1,870	10	1,880	0.21	0.21	A	A	No	No
		Southbound	4	2,124	1	2,125	0.48	0.48	A	A	No	No
5	Hopyard Road between Interstate 580 Eastbound ramps and Owens Drive	Northbound	3	1,149	6	1,155	0.35	0.35	A	A	No	No
		Southbound	3	1,544	1	1,545	0.47	0.47	A	A	No	No
6	Dublin Boulevard west of Dougherty Road	Eastbound	5	1,075	4	1,079	0.20	0.20	A	A	No	No
		Westbound	3	2,510	1	2,511	0.76	0.76	C	C	No	No
7	Dublin Boulevard between Dougherty Road and Scarlett Drive	Eastbound	3	1,323	19	1,342	0.40	0.41	A	A	No	No
		Westbound	3	1,779	2	1,781	0.54	0.54	A	A	No	No
8	Dublin Boulevard between Scarlett Drive and DeMarcus Boulevard	Eastbound	3	1,360	39	1,399	0.41	0.42	A	A	No	No
		Westbound	3	1,840	6	1,846	0.56	0.56	A	A	No	No
9	Dublin Boulevard between DeMarcus Boulevard and Iron Horse Parkway	Eastbound	3	928	39	967	0.28	0.29	A	A	No	No
		Westbound	3	1,997	6	2,003	0.61	0.61	B	B	No	No
10	Dublin Boulevard between Iron Horse Parkway and Arnold Road	Eastbound	3	374	7	381	0.11	0.12	A	A	No	No
		Westbound	3	2,620	4	2,624	0.79	0.80	C	C	No	No
11	Dublin Boulevard between Arnold Road and Hacienda Drive	Eastbound	3	245	9	254	0.07	0.08	A	A	No	No
		Westbound	3	2,697	44	2,741	0.82	0.83	D	D	No	No
12	Dublin Boulevard between Hacienda Drive and Hibernia Drive	Eastbound	4	151	7	158	0.03	0.04	A	A	No	No
		Westbound	3	2,731	51	2,782	0.83	0.84	D	D	No	No

13	Dublin Boulevard between Hibernia Drive and Toyota Drive	Eastbound	3	167	7	174	0.05	0.05	A	A	No	No
		Westbound	3	2,717	51	2,768	0.82	0.84	D	D	No	No
14	Dublin Boulevard between Toyota Drive and Tassajara Road	Eastbound	3	162	7	169	0.05	0.05	A	A	No	No
		Westbound	3	2,728	51	2,779	0.83	0.84	D	D	No	No
15	Dublin Boulevard east of Tassajara Road	Eastbound	3	176	3	179	0.05	0.05	A	A	No	No
		Westbound	3	2,758	23	2,781	0.84	0.84	D	D	No	No
16	Tassajara Road North of Dublin Boulevard	Northbound	2	222	2	224	0.10	0.10	A	A	No	No
		Southbound	3	693	15	708	0.21	0.21	A	A	No	No
17	Tassajara Road between Dublin Boulevard and Interstate I 580 WB on-off ramps	Northbound	3	550	13	563	0.17	0.17	A	A	No	No
		Southbound	4	1,099	2	1,101	0.25	0.25	A	A	No	No
18	Tassajara Road between Interstate I 580 WB on-off ramps and Pimlico Drive	Northbound	3	612	13	625	0.19	0.19	A	A	No	No
		Southbound	3	1,235	2	1,237	0.37	0.37	A	A	No	No
19	Santa Rita Road between Pimlico Drive and Las Positas Boulevard	Northbound	3	900	13	913	0.27	0.28	A	A	No	No
		Southbound	3	1,315	2	1,317	0.40	0.40	A	A	No	No

Notes:
[1.]V/C – Volume to Capacity ratio
[2]LOS – Level of Service

Table 19: Near – Term with Project Conditions MTS Roadway Segment Level of Service Analysis for PM Peak Hour

No	Study Segments	Direction	# Lanes	No Project Volume AM Peak Hour	Project Volumes AM Peak Hour	With Project Volume	V/C[1] Ratio No Project	V/C[1] Ratio plus Project	No Project LOS[2]	Plus Project LOS[2]	Change from LOS E or better to LOS F	LOS F and Change in V/C > 0.02
1	Dougherty Road North of Scarlett Drive	Northbound	3	2,998	16	3,014	0.91	0.91	E	E	No	No
		Southbound	3	756	25	781	0.23	0.24	A	A	No	No
2	Dougherty Road between Scarlett Drive and Dublin Boulevard	Northbound	3	2,889	0	2,889	0.88	0.88	D	D	No	No
		Southbound	3	718	0	718	0.22	0.22	A	A	No	No
3	Dougherty Road between Dublin Boulevard and Interstate 580	Northbound	3	3,326	8	3,334	**1.01**	**1.01**	**F**	**F**	No	No
		Southbound	3	1,689	9	1,698	0.51	0.51	A	A	No	No
4	Dougherty Road between Interstate 580 Eastbound and Westbound ramps	Northbound	8	2,761	8	2,769	0.31	0.31	A	A	No	No
		Southbound	4	1,304	5	1,309	0.30	0.30	A	A	No	No
5	Hopyard Road between Interstate 580 Eastbound ramps and Owens Drive	Northbound	3	1,857	0	1,857	0.56	0.56	A	A	No	No
		Southbound	3	1,234	5	1,239	0.37	0.38	A	A	No	No
6	Dublin Boulevard west of Dougherty Road	Eastbound	5	942	2	944	0.17	0.17	A	A	No	No
		Westbound	3	1,711	4	1,715	0.52	0.52	A	A	No	No
7	Dublin Boulevard between Dougherty Road and Scarlett Drive	Eastbound	3	1,122	10	1,132	0.34	0.34	A	A	No	No
		Westbound	3	2,176	13	2,189	0.66	0.66	B	B	No	No
8	Dublin Boulevard between Scarlett Drive and DeMarcus Boulevard	Eastbound	3	1,191	17	1,208	0.36	0.37	A	A	No	No
		Westbound	3	2,310	29	2,339	0.70	0.71	B	C	No	No
9	Dublin Boulevard between DeMarcus Boulevard and Iron Horse Parkway	Eastbound	3	1,528	17	1,545	0.46	0.47	A	A	No	No
		Westbound	3	1,605	29	1,634	0.49	0.50	A	A	No	No
10	Dublin Boulevard between Iron Horse Parkway and Arnold Road	Eastbound	3	2,506	15	2,521	0.76	0.76	C	C	No	No
		Westbound	3	826	7	833	0.25	0.25	A	A	No	No
11	Dublin Boulevard between Arnold Road and Hacienda Drive	Eastbound	3	2,821	31	2,852	0.85	0.86	D	D	No	No
		Westbound	3	520	17	537	0.16	0.16	A	A	No	No
12	Dublin Boulevard between Hacienda Drive and Hibernia Drive	Eastbound	4	3,226	33	3,259	0.73	0.74	C	C	No	No
		Westbound	3	247	20	267	0.07	0.08	A	A	No	No

13	Dublin Boulevard between Hibernia Drive and Toyota Drive	Eastbound	3	3,225	33	3,258	0.98	0.99	E	E	No	No
		Westbound	3	251	20	271	0.08	0.08	A	A	No	No
14	Dublin Boulevard between Toyota Drive and Tassajara Road	Eastbound	3	3,237	33	3,270	0.98	0.99	E	E	No	No
		Westbound	3	247	20	267	0.07	0.08	A	A	No	No
15	Dublin Boulevard east of Tassajara Road	Eastbound	3	3,116	15	3,131	0.94	0.95	E	E	No	No
		Westbound	3	243	12	255	0.07	0.08	A	A	No	No
16	Tassajara Road North of Dublin Boulevard	Northbound	2	903	10	913	0.41	0.42	A	A	No	No
		Southbound	3	472	4	476	0.14	0.14	A	A	No	No
17	Tassajara Road between Dublin Boulevard and Interstate I 580 WB on-off ramps	Northbound	3	1,367	4	1,371	0.41	0.42	A	A	No	No
		Southbound	4	1,010	8	1,018	0.23	0.23	A	A	No	No
18	Tassajara Road between Interstate I 580 WB on-off ramps and Pimlico Drive	Northbound	3	1,430	4	1,434	0.43	0.43	A	A	No	No
		Southbound	3	1,582	8	1,590	0.48	0.48	A	A	No	No
19	Santa Rita Road between Pimlico Drive and Las Positas Boulevard	Northbound	3	1,646	4	1,650	0.50	0.50	A	A	No	No
		Southbound	3	1,249	8	1,257	0.38	0.38	A	A	No	No

Notes:

[1.] V/C – Volume to Capacity ratio

[2] LOS – Level of Service

Table 20: Near – Term with Project Conditions MTS Freeway Segment Level of Service Analysis – AM Peak Hour

No	Study Segments	Direction	# Lanes	No Project Volume AM Peak Hour	Project Volumes AM Peak Hour	With Project Volume	V/C[1] Ratio No Project	V/C[1] Ratio plus Project	No Project LOS[2]	Plus Project LOS[2]	Change from LOS E or better to LOS F	LOS F and Change in V/C > 0.02
1	I-680 between Alcosta Boulevard and I 580 ramps	Northbound	5	6,895	8	6,903	0.66	0.66	B	B	No	No
		Southbound	5	6,336	51	6,387	0.60	0.61	A	B	No	No
2	I-680 between I 580 ramps and Stoneridge Drive	Northbound	4	5,154	0	5,154	0.61	0.61	B	B	No	No
		Southbound	4	6,375	0	6,375	0.76	0.76	C	C	No	No
3	I -580 between I -680 ramps and Hopyard Road	Eastbound	6	4,879	40	4,919	0.39	0.39	A	A	No	No
		Westbound	6	9,402	7	9,409	0.75	0.75	C	C	No	No
4	I -580 between Hopyard Road and Hacienda Drive	Eastbound	6	5,735	11	5,746	0.46	0.46	A	A	No	No
		Westbound	6	10,321	74	10,395	0.82	0.83	D	D	No	No
5	I -580 between Hacienda Drive and Santa Rita Drive	Eastbound	6	5,535	11	5,546	0.44	0.44	A	A	No	No
		Westbound	6	10,789	74	10,863	0.86	0.86	D	D	No	No
6	I -580 between Santa Rita Drive and Fallon Road	Eastbound	6	5,840	11	5,851	0.46	0.46	A	A	No	No
		Westbound	6	10,981	74	11,055	0.87	0.88	D	D	No	No

Notes:
[1] V/C – Volume to Capacity ratio
[2] LOS – Level of Service

Table 21: Near – Term with Project Conditions MTS Freeway Segment Level of Service Analysis – PM Peak Hour

No	Study Segments	Direction	# Lanes	No Project Volume AM Peak Hour	Project Volumes AM Peak Hour	With Project Volume	V/C[1] Ratio No Project	V/C[1] Ratio plus Project	No Project LOS[2]	Plus Project LOS[2]	Change from LOS E or better to LOS F	LOS F and Change in V/C > 0.02
1	I-680 between Alcosta Boulevard and I 580 ramps	Northbound	5	6,537	32	6,569	0.62	0.63	B	B	No	No
		Southbound	5	7,310	14	7,324	0.70	0.70	B	B	No	No
2	I-680 between I 580 ramps and Stoneridge Drive	Northbound	4	5,562	0	5,562	0.66	0.66	B	B	No	No
		Southbound	4	5,025	0	5,025	0.60	0.60	A	A	No	No
3	I -580 between I -680 ramps and Hopyard Road	Eastbound	6	10,428	4	10,432	0.83	0.83	D	D	No	No
		Westbound	6	5,851	24	5,875	0.46	0.47	A	A	No	No
4	I -580 between Hopyard Road and Hacienda Drive	Eastbound	6	11,077	47	11,124	0.88	0.88	D	D	No	No
		Westbound	6	7,137	21	7,158	0.57	0.57	A	A	No	No
5	I -580 between Hopyard Road and Santa Rita Drive	Eastbound	6	10,389	47	10,436	0.82	0.83	D	D	No	No
		Westbound	6	7,285	21	7,306	0.58	0.58	A	A	No	No
6	I -580 between Santa Rita Drive and Fallon Road	Eastbound	6	10,827	47	10,874	0.86	0.86	D	D	No	No
		Westbound	6	7,696	21	7,717	0.61	0.61	B	B	No	No

Notes:
[1]V/C – Volume to Capacity ratio
[2] LOS – Level of Service

QUEUING ANALYSIS AT STUDY INTERSECTIONS

TJKM conducted a vehicle queuing and storage analyses for all exclusive left turn pockets at selected study intersections and driveways where project traffic is added under existing and Near-Term with and without project conditions. The 95th percentile (maximum) queues were analyzed using the HCM 2000 Queue methodology contained in Synchro 9.0 software for the exclusive left turn pockets at the study intersections where project traffic is added. Detailed calculations are included in the **Appendix F. Table 22** summarizes the 95th percentile queue lengths at the selected intersections under Existing with and without project conditions.

Table 22: 95th Percentile Queues at Turn Pockets Affected by Project Traffic – Existing with and without Project Conditions

ID	Study Intersections	Lane Group	Storage Length per lane	Existing Conditions		Existing with Project Conditions		Change in 95th Percentile Queue Length	
				AM	PM	AM	PM	AM	PM
7	Dublin Boulevard / Iron Horse Parkway	WBL	1 lane / 275 feet	75	75	81	80	6	5
8	Dublin Boulevard / Arnold Road	WBL	2 lanes / 350 feet	30	23	58	30	28	7
12	Hacienda Drive / Martinelli Way-Hacienda Crossings	NBL	2 lanes / 350 feet	157	333	318	362	**161**	**29**

Notes: Storage length and 95th percentile queue is expressed in feet per lane

Dublin Boulevard / Iron Horse Parkway (Int. # 7) – For this intersection westbound left turn available queuing capacity is not exceeded for the both a.m. and p.m. peak hours under both Existing and Existing with Project Conditions.

Dublin Boulevard / Arnold Road (Int. # 8) – For this intersection westbound left turn available queuing capacity is not exceeded for the both a.m. and p.m. peak hours under both Existing and Existing with Project Conditions.

Hacienda Drive / Martinelli Way-Hacienda Crossings (Int. # 12) – For this intersection, for northbound left turns the project traffic causes the 95th percentile queue for the northbound left turn pocket to extend beyond the turn pocket by approximately 12 feet in the p.m. peak hour (i.e., the length of less than one vehicle) in to adjacent traffic lanes that operate (i.e., move) separately from the left turn lane.

Table 23 summarizes the 95th percentile queue lengths at the selected intersections under Near-Term with and without project conditions.

Table 23: 95th Percentile Queues at Turn Pockets Affected by Project Traffic – Near - Term with and without Project Conditions

ID	Study Intersections	Lane Group	Storage Length per lane	Near-Term Conditions		Near-Term With Project Conditions		Change in 95th Percentile Queue Length	
				AM	PM	AM	PM	AM	PM
7	Dublin Boulevard / Iron Horse Parkway	WBL	1 lane / 275 feet	123	169	130	176	7	7
8	Dublin Boulevard / Arnold Road	WBL	2 lanes / 350 feet	150	92	173	98	23	6
12	Hacienda Drive / Martinelli Way-Hacienda Crossings	NBL	3 lanes / 350 feet	225	624	311	640	86	16

Notes: Storage length and 95th percentile queue is expressed in feet per lane

Dublin Boulevard / Iron Horse Parkway (Int. # 7) – For this intersection westbound left turn available queuing capacity is not exceeded for the both a.m. and p.m. peak hours under both Near-Term and Near-Term with Project Conditions.

Dublin Boulevard / Arnold Road (Int. # 8) – For this intersection westbound left turn available queuing capacity is not exceeded for the both a.m. and p.m. peak hours under both Near-Term and Near-with Project Conditions.

Hacienda Drive / Martinelli Way-Hacienda Crossings (Int. # 12) –The northbound left turn queue already exceeds the capacity in the p.m.; the project adds less than one car length.   It should be noted that the planned third left turn lane is assumed in place.

CONSTRUCTION IMPACTS

OVERVIEW

The construction of the new parking garage will occur on the north side of the existing BART garage. The existing site is unpaved and will require excavation of existing materials. Construction will occur over a 12 month period. Since the existing construction area is flat and level, no major grading efforts will be required. The vacant site immediately west of the proposed parking garage will be used as a staging area for construction equipment, supplies, materials and possibly field offices. The construction phases are expected to consist of:

1. Site preparation, minor grading and drainage
2. Relocate any existing utilities
3. Construction of the new structure including adjacent Campus Drive
4. New sidewalks and landscaping immediately surrounding the site

CONSTRUCTION DETAILS

Construction activity will occur between 7 a.m. and 7 p.m. on weekdays. There are multi-family homes to the north and west of the site area, so the construction noises could affect residents if construction were to extend beyond these hours. There will be approximately 20 to 30 workers on site during peak construction periods. Each worker can be expected to average about three vehicular trips per day including one trip during each of the commute periods, or a maximum of 90 daily trips. In addition to worker trips to and from the site, there will be truck activity during much of the construction period. Truck activity is estimated to be as follows:

Table 24. Estimated Truck Trips during Construction Periods

Activity	Quantities	Truck Capacity	Truck Loads	Total Truck Trips	Days of activity	Truck trips per day[1]
Off haul excavation	2,700 yd^3	10 yds^3/trip	270	540	20	27
Concrete deliveries	7,325 yd^3	8.5 yd^3/trip	862	1,724	120	18
Rebar deliveries	570 tons	22.5 tons/trip	25	50	25	2
Subtotal			1,157	2,314		
Misc. +25%			290	580		
Total			**1,447**	**2,894**		

Note: 1 Total trucks/days of activity x 1.25

Table 24 illustrates the number of daily truck trips that are likely to be generated at the site during each activity of the construction period. During most of the construction period 20 to 27 truck trips can be expected each day. Most of the truck trips will not occur during peak periods as the truck traffic will be spread uniformly throughout the day, with a likely maximum of two truck trips during each peak hour. The construction workers will account for up to 30 peak hour trips, yielding a total of 30 auto trips and two truck trips during most days.

Trucks will likely arrive at the site using Martinelli Way, Arnold Road, Dublin Boulevard, and either the Dougherty Road or Hacienda Drive interchanges with I-580. The Hacienda Drive interchange is preferred due to lower levels of congestion. The construction activity should not interfere with existing access to and from the BART garage immediately to the south.

Overall, construction traffic will not increase traffic or congestion to levels described elsewhere in the report resulting from the operation of the expanded parking garage.

Appendix A – Turning Movement Counts

ALL TRAFFIC DATA

City of Dublin
All Vehicles & Uturns On Unshifted
Nothing On Bank 1
Nothing On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7377-001 Dougherty Rd & Scarlett Dr
Date : 5/24/2016

Unshifted Count = All Vehicles & Uturns

	Dougherty Rd Southbound					Scarlett Dr Westbound					Dougherty Rd Northbound					Scarlett Dr Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
6:30	0	316	0	1	317	3	0	0	0	3	3	142	1	0	146	1	0	9	0	10	476	1
6:45	2	387	0	0	389	8	0	2	0	10	1	193	1	0	195	0	0	9	0	9	603	0
7:00	2	409	0	1	412	8	0	2	0	10	2	188	2	0	192	1	0	18	0	19	633	1
7:15	2	518	0	0	520	11	1	1	0	13	1	245	3	0	249	1	0	8	0	9	791	0
Total	6	1630	0	2	1638	30	1	5	0	36	7	768	7	0	782	3	0	44	0	47	2503	2
7:30	1	487	1	0	489	10	0	4	0	14	3	275	2	0	280	1	0	9	0	10	793	0
7:45	2	513	1	0	516	17	0	4	0	21	6	285	4	0	295	5	0	21	0	26	858	0
8:00	1	463	3	0	467	11	0	6	0	17	4	270	4	0	278	6	0	14	0	20	782	0
8:15	1	476	1	0	478	10	0	2	0	12	4	233	2	0	239	4	0	12	0	16	745	0
Total	5	1939	6	0	1950	48	0	16	0	64	17	1063	12	0	1092	16	0	56	0	72	3178	0
16:30	1	379	3	0	383	10	0	3	0	13	9	433	4	0	446	1	0	3	0	4	846	0
16:45	4	354	5	0	363	6	0	0	0	6	9	509	2	0	520	1	1	7	0	9	898	0
17:00	2	359	5	1	367	6	0	5	0	11	7	464	3	0	474	3	1	9	0	13	865	1
17:15	11	386	2	0	399	13	0	3	0	16	8	498	2	0	508	2	0	7	0	9	932	0
Total	18	1478	15	1	1512	35	0	11	0	46	33	1904	11	0	1948	7	2	26	0	35	3541	1
17:30	5	388	3	1	397	16	0	12	0	28	16	538	5	0	559	1	1	5	0	7	991	1
17:45	3	328	10	0	341	9	0	3	0	12	19	579	1	0	599	0	0	8	0	8	960	0
18:00	5	342	5	0	352	22	0	5	0	27	15	514	2	0	531	3	0	6	0	9	919	0
18:15	3	352	8	0	363	9	0	6	0	15	19	525	4	0	548	3	0	13	1	17	943	1
Total	16	1410	26	1	1453	56	0	26	0	82	69	2156	12	0	2237	7	1	32	1	41	3813	2
Grand Total	45	6457	47	4	6553	169	1	58	0	228	126	5891	42	0	6059	33	3	158	1	195	13035	5
Apprch %	0.7%	98.5%	0.7%	0.1%		74.1%	0.4%	25.4%	0.0%		2.1%	97.2%	0.7%	0.0%		16.9%	1.5%	81.0%	0.5%			
Total %	0.3%	49.5%	0.4%	0.0%	50.3%	1.3%	0.0%	0.4%	0.0%	1.7%	1.0%	45.2%	0.3%	0.0%	46.5%	0.3%	0.0%	1.2%	0.0%	1.5%	100.0%	

AM PEAK HOUR	Dougherty Rd Southbound					Scarlett Dr Westbound					Dougherty Rd Northbound					Scarlett Dr Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:15 to 08:15																					
Peak Hour For Entire Intersection Begins at 07:15																					
7:15	2	518	0	0	520	11	1	1	0	13	1	245	3	0	249	1	0	8	0	9	791
7:30	1	487	1	0	489	10	0	4	0	14	3	275	2	0	280	1	0	9	0	10	793
7:45	2	513	1	0	516	17	0	4	0	21	6	285	4	0	295	5	0	21	0	26	858
8:00	1	463	3	0	467	11	0	6	0	17	4	270	4	0	278	6	0	14	0	20	782
Total Volume	6	1981	5	0	1992	49	1	15	0	65	14	1075	13	0	1102	13	0	52	0	65	3224
% App Total	0.3%	99.4%	0.3%	0.0%		75.4%	1.5%	23.1%	0.0%		1.3%	97.5%	1.2%	0.0%		20.0%	0.0%	80.0%	0.0%		
PHF	.750	.956	.417	.000	.958	.721	.250	.625	.000	.774	.583	.943	.813	.000	.934	.542	.000	.619	.000	.625	.939

PM PEAK HOUR	Dougherty Rd Southbound					Scarlett Dr Westbound					Dougherty Rd Northbound					Scarlett Dr Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:30 to 18:30																					
Peak Hour For Entire Intersection Begins at 17:30																					
17:30	5	388	3	1	397	16	0	12	0	28	16	538	5	0	559	1	1	5	0	7	991
17:45	3	328	10	0	341	9	0	3	0	12	19	579	1	0	599	0	0	8	0	8	960
18:00	5	342	5	0	352	22	0	5	0	27	15	514	2	0	531	3	0	6	0	9	919
18:15	3	352	8	0	363	9	0	6	0	15	19	525	4	0	548	3	0	13	1	17	943
Total Volume	16	1410	26	1	1453	56	0	26	0	82	69	2156	12	0	2237	7	1	32	1	41	3813
% App Total	1.1%	97.0%	1.8%	0.1%		68.3%	0.0%	31.7%	0.0%		3.1%	96.4%	0.5%	0.0%		17.1%	2.4%	78.0%	2.4%		
PHF	.800	.909	.650	.250	.915	.636	.000	.542	.000	.732	.908	.931	.600	.000	.934	.583	.250	.615	.250	.603	.962

ALL TRAFFIC DATA

City of Dublin
All Vehicles & Uturns On Unshifted
Nothing On Bank 1
Nothing On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7377-002 Dougherty Rd & Dublin Blvd
Date : 5/24/2016

Unshifted Count = All Vehicles & Uturns

	Dougherty Rd Southbound					Dublin Blvd Westbound					Dougherty Rd Northbound					Dublin Blvd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
6:30	69	220	7	1	297	32	35	29	1	97	73	146	55	0	274	6	28	39	0	73	741	2
6:45	115	283	16	0	414	52	46	34	3	135	77	221	71	1	370	6	25	34	0	65	984	4
7:00	142	268	12	1	423	56	56	47	3	162	110	205	73	1	389	8	23	46	1	78	1052	6
7:15	169	319	16	1	505	33	85	70	2	190	107	220	89	0	416	5	44	59	3	111	1222	6
Total	495	1090	51	3	1639	173	222	180	9	584	367	792	288	2	1449	25	120	178	4	327	3999	18
7:30	110	385	13	0	508	64	167	107	1	339	129	264	74	0	467	7	54	79	1	141	1455	2
7:45	122	387	17	0	526	51	133	85	3	272	144	235	95	0	474	7	67	96	0	170	1442	3
8:00	125	385	21	0	531	53	151	84	2	290	152	224	77	0	453	9	63	96	2	170	1444	4
8:15	87	360	20	0	467	80	163	89	2	334	143	185	76	0	404	16	57	98	1	172	1377	3
Total	444	1517	71	0	2032	248	614	365	8	1235	568	908	322	0	1798	39	241	369	4	653	5718	12
16:30	108	290	18	0	416	87	156	118	8	369	166	301	96	1	564	33	198	186	3	420	1769	12
16:45	126	210	26	2	364	67	161	131	8	367	196	327	103	0	626	22	224	155	4	405	1762	14
17:00	118	261	18	0	397	98	143	145	5	391	201	350	84	0	635	25	194	180	1	400	1823	6
17:15	128	293	30	0	451	98	176	156	7	437	178	370	106	1	655	46	217	145	10	418	1961	18
Total	480	1054	92	2	1628	350	636	550	28	1564	741	1348	389	2	2480	126	833	666	18	1643	7315	50
17:30	138	296	26	0	460	86	174	163	2	425	179	330	79	0	588	36	213	186	4	439	1912	6
17:45	122	241	21	1	385	77	197	171	13	458	193	384	76	0	653	26	185	126	2	339	1835	16
18:00	115	224	29	1	369	73	139	176	12	400	153	335	64	0	552	15	194	148	2	359	1680	15
18:15	98	260	15	1	374	67	175	159	7	408	144	349	62	0	555	43	145	151	4	343	1680	12
Total	473	1021	91	3	1588	303	685	669	34	1691	669	1398	281	0	2348	120	737	611	12	1480	7107	49
Grand Total	1892	4682	305	8	6887	1074	2157	1764	79	5074	2345	4446	1280	4	8075	310	1931	1824	38	4103	24139	129
Apprch %	27.5%	68.0%	4.4%	0.1%		21.2%	42.5%	34.8%	1.6%		29.0%	55.1%	15.9%	0.0%		7.6%	47.1%	44.5%	0.9%			
Total %	7.8%	19.4%	1.3%	0.0%	28.5%	4.4%	8.9%	7.3%	0.3%	21.0%	9.7%	18.4%	5.3%	0.0%	33.5%	1.3%	8.0%	7.6%	0.2%	17.0%	100.0%	

AM PEAK HOUR	Dougherty Rd Southbound					Dublin Blvd Westbound					Dougherty Rd Northbound					Dublin Blvd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:30 to 08:30																					
Peak Hour For Entire Intersection Begins at 07:30																					
7:30	110	385	13	0	508	64	167	107	1	339	129	264	74	0	467	7	54	79	1	141	1455
7:45	122	387	17	0	526	51	133	85	3	272	144	235	95	0	474	7	67	96	0	170	1442
8:00	125	385	21	0	531	53	151	84	2	290	152	224	77	0	453	9	63	96	2	170	1444
8:15	87	360	20	0	467	80	163	89	2	334	143	185	76	0	404	16	57	98	1	172	1377
Total Volume	444	1517	71	0	2032	248	614	365	8	1235	568	908	322	0	1798	39	241	369	4	653	5718
% App Total	21.9%	74.7%	3.5%	0.0%		20.1%	49.7%	29.6%	0.6%		31.6%	50.5%	17.9%	0.0%		6.0%	36.9%	56.5%	0.6%		
PHF	.888	.980	.845	.000	.957	.775	.919	.853	.667	.911	.934	.860	.847	.000	.948	.609	.899	.941	.500	.949	.982

PM PEAK HOUR	Dougherty Rd Southbound					Dublin Blvd Westbound					Dougherty Rd Northbound					Dublin Blvd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	118	261	18	0	397	98	143	145	5	391	201	350	84	0	635	25	194	180	1	400	1823
17:15	128	293	30	0	451	98	176	156	7	437	178	370	106	1	655	46	217	145	10	418	1961
17:30	138	296	26	0	460	86	174	163	2	425	179	330	79	0	588	36	213	186	4	439	1912
17:45	122	241	21	1	385	77	197	171	13	458	193	384	76	0	653	26	185	126	2	339	1835
Total Volume	506	1091	95	1	1693	359	690	635	27	1711	751	1434	345	1	2531	133	809	637	17	1596	7531
% App Total	29.9%	64.4%	5.6%	0.1%		21.0%	40.3%	37.1%	1.6%		29.7%	56.7%	13.6%	0.0%		8.3%	50.7%	39.9%	1.1%		
PHF	.917	.921	.792	.250	.920	.916	.876	.928	.519	.934	.934	.934	.814	.250	.966	.723	.932	.856	.425	.909	.960

ALL TRAFFIC DATA

(916) 771-8700
orders@atdtraffic.com

City of Dublin
All Vehicles & Uturns On Unshifted
Nothing On Bank 1
Nothing On Bank 2

File Name : 16-7377-003 Dougherty Rd & I-580 WB Off Ramp
Date : 5/24/2016

Unshifted Count = All Vehicles & Uturns

	Dougherty Rd Southbound					I-580 WB Off Ramp Westbound					Dougherty Rd Northbound					I-580 WB Off Ramp Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
6:30	0	180	0	0	180	61	0	102	0	163	0	174	0	0	174	0	0	0	0	0	517	0
6:45	0	198	0	0	198	70	0	124	0	194	0	247	0	0	247	0	0	0	0	0	639	0
7:00	0	217	0	0	217	70	0	148	0	218	0	234	0	0	234	0	0	0	0	0	669	0
7:15	0	264	0	0	264	83	0	156	0	239	0	273	0	0	273	0	0	0	0	0	776	0
Total	0	859	0	0	859	284	0	530	0	814	0	928	0	0	928	0	0	0	0	0	2601	0
7:30	0	385	0	0	385	73	0	175	0	248	0	280	0	0	280	0	0	0	0	0	913	0
7:45	0	419	0	0	419	110	0	180	0	290	0	301	0	0	301	0	0	0	0	0	1010	0
8:00	0	395	0	0	395	100	0	186	0	286	0	261	0	0	261	0	0	0	0	0	942	0
8:15	0	407	0	0	407	112	0	167	0	279	0	257	0	0	257	0	0	0	0	0	943	0
Total	0	1606	0	0	1606	395	0	708	0	1103	0	1099	0	0	1099	0	0	0	0	0	3808	0
16:30	0	373	0	0	373	68	0	138	0	206	0	465	0	0	465	0	0	0	0	0	1044	0
16:45	0	321	0	0	321	85	0	165	0	250	0	479	0	0	479	0	0	0	0	0	1050	0
17:00	0	364	0	0	364	67	0	174	0	241	0	496	0	0	496	0	0	0	0	0	1101	0
17:15	0	354	0	0	354	75	0	212	0	287	0	471	0	0	471	0	0	0	0	0	1112	0
Total	0	1412	0	0	1412	295	0	689	0	984	0	1911	0	0	1911	0	0	0	0	0	4307	0
17:30	0	394	0	0	394	57	0	159	0	216	0	434	0	0	434	0	0	0	0	0	1044	0
17:45	0	303	0	0	303	110	0	201	0	311	0	434	0	0	434	0	0	0	0	0	1048	0
18:00	0	323	0	0	323	65	0	155	0	220	0	415	0	0	415	0	0	0	0	0	958	0
18:15	0	349	0	0	349	51	0	163	0	214	0	381	0	0	381	0	0	0	0	0	944	0
Total	0	1369	0	0	1369	283	0	678	0	961	0	1664	0	0	1664	0	0	0	0	0	3994	0
Grand Total	0	5246	0	0	5246	1257	0	2605	0	3862	0	5602	0	0	5602	0	0	0	0	0	14710	0
Apprch %	0.0%	100.0%	0.0%	0.0%		32.5%	0.0%	67.5%	0.0%		0.0%	100.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%			
Total %	0.0%	35.7%	0.0%	0.0%	35.7%	8.5%	0.0%	17.7%	0.0%	26.3%	0.0%	38.1%	0.0%	0.0%	38.1%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	

AM PEAK HOUR	Dougherty Rd Southbound					I-580 WB Off Ramp Westbound					Dougherty Rd Northbound					I-580 WB Off Ramp Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:30 to 08:30																					
Peak Hour For Entire Intersection Begins at 07:30																					
7:30	0	385	0	0	385	73	0	175	0	248	0	280	0	0	280	0	0	0	0	0	913
7:45	0	419	0	0	419	110	0	180	0	290	0	301	0	0	301	0	0	0	0	0	1010
8:00	0	395	0	0	395	100	0	186	0	286	0	261	0	0	261	0	0	0	0	0	942
8:15	0	407	0	0	407	112	0	167	0	279	0	257	0	0	257	0	0	0	0	0	943
Total Volume	0	1606	0	0	1606	395	0	708	0	1103	0	1099	0	0	1099	0	0	0	0	0	3808
% App Total	0.0%	100.0%	0.0%	0.0%		35.8%	0.0%	64.2%	0.0%		0.0%	100.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		
PHF	.000	.958	.000	.000	.958	.882	.000	.952	.000	.951	.000	.913	.000	.000	.913	.000	.000	.000	.000	.000	.943

PM PEAK HOUR	Dougherty Rd Southbound					I-580 WB Off Ramp Westbound					Dougherty Rd Northbound					I-580 WB Off Ramp Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 16:30 to 17:30																					
Peak Hour For Entire Intersection Begins at 16:30																					
16:30	0	373	0	0	373	68	0	138	0	206	0	465	0	0	465	0	0	0	0	0	1044
16:45	0	321	0	0	321	85	0	165	0	250	0	479	0	0	479	0	0	0	0	0	1050
17:00	0	364	0	0	364	67	0	174	0	241	0	496	0	0	496	0	0	0	0	0	1101
17:15	0	354	0	0	354	75	0	212	0	287	0	471	0	0	471	0	0	0	0	0	1112
Total Volume	0	1412	0	0	1412	295	0	689	0	984	0	1911	0	0	1911	0	0	0	0	0	4307
% App Total	0.0%	100.0%	0.0%	0.0%		30.0%	0.0%	70.0%	0.0%		0.0%	100.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		
PHF	.000	.946	.000	.000	.946	.868	.000	.813	.000	.857	.000	.963	.000	.000	.963	.000	.000	.000	.000	.000	.968

ALL TRAFFIC DATA

(916) 771-8700
orders@atdtraffic.com

City of Dublin
All Vehicles & Uturns On Unshifted
Nothing On Bank 1
Nothing On Bank 2

File Name : 16-7377-005 Scarlett Dr & Dublin Blvd
Date : 5/24/2016

Unshifted Count = All Vehicles & Uturns

	Scarlett Dr Southbound					Dublin Blvd Westbound					Scarlett Dr Northbound					Dublin Blvd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
6:30	0	0	0	0	0	1	85	0	1	87	8	0	0	0	8	0	117	21	1	139	234	2
6:45	0	0	0	0	0	3	122	0	0	125	10	0	1	0	11	0	183	25	2	210	346	2
7:00	0	0	0	0	0	5	149	0	0	154	14	0	1	0	15	0	175	30	0	205	374	0
7:15	0	0	0	0	0	5	195	0	2	202	10	0	1	0	11	0	251	35	1	287	500	3
Total	0	0	0	0	0	14	551	0	3	568	42	0	3	0	45	0	726	111	4	841	1454	7
7:30	0	0	0	0	0	15	312	0	0	327	18	0	8	0	26	0	222	19	1	242	595	1
7:45	0	0	0	0	0	8	294	0	0	302	11	0	6	1	18	0	214	38	1	253	573	2
8:00	0	0	0	0	0	4	263	0	4	271	16	0	10	0	26	0	203	38	0	241	538	4
8:15	0	0	0	0	0	4	298	0	1	303	20	0	6	0	26	0	161	43	4	208	537	5
Total	0	0	0	0	0	31	1167	0	5	1203	65	0	30	1	96	0	800	138	6	944	2243	12
16:30	0	0	0	0	0	4	274	0	0	278	41	0	18	0	59	0	367	15	8	390	727	8
16:45	0	0	0	0	0	2	342	0	2	346	29	0	18	1	48	0	423	16	13	452	846	16
17:00	0	0	0	0	0	4	352	0	1	357	32	0	13	0	45	0	388	9	6	403	805	7
17:15	0	0	0	0	0	4	401	0	1	406	17	0	11	1	29	0	457	8	0	465	900	2
Total	0	0	0	0	0	14	1369	0	4	1387	119	0	60	2	181	0	1635	48	27	1710	3278	33
17:30	0	0	0	0	0	4	418	0	3	425	19	0	19	0	38	0	408	3	4	415	878	7
17:45	0	0	0	0	0	5	437	0	1	443	16	0	9	1	26	0	364	1	4	369	838	6
18:00	0	0	0	0	0	2	350	0	0	352	12	0	11	0	23	0	368	2	1	371	746	1
18:15	0	0	0	0	0	3	384	0	0	387	17	0	6	0	23	0	298	0	3	301	711	3
Total	0	0	0	0	0	14	1589	0	4	1607	64	0	45	1	110	0	1438	6	12	1456	3173	17
Grand Total	0	0	0	0	0	73	4676	0	16	4765	290	0	138	4	432	0	4599	303	49	4951	10148	69
Apprch %	0.0%	0.0%	0.0%	0.0%		1.5%	98.1%	0.0%	0.3%		67.1%	0.0%	31.9%	0.9%		0.0%	92.9%	6.1%	1.0%			
Total %	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	46.1%	0.0%	0.2%	47.0%	2.9%	0.0%	1.4%	0.0%	4.3%	0.0%	45.3%	3.0%	0.5%	48.8%	100.0%	

AM PEAK HOUR	Scarlett Dr Southbound					Dublin Blvd Westbound					Scarlett Dr Northbound					Dublin Blvd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:30 to 08:30																					
Peak Hour For Entire Intersection Begins at 07:30																					
7:30	0	0	0	0	0	15	312	0	0	327	18	0	8	0	26	0	222	19	1	242	595
7:45	0	0	0	0	0	8	294	0	0	302	11	0	6	1	18	0	214	38	1	253	573
8:00	0	0	0	0	0	4	263	0	4	271	16	0	10	0	26	0	203	38	0	241	538
8:15	0	0	0	0	0	4	298	0	1	303	20	0	6	0	26	0	161	43	4	208	537
Total Volume	0	0	0	0	0	31	1167	0	5	1203	65	0	30	1	96	0	800	138	6	944	2243
% App Total	0.0%	0.0%	0.0%	0.0%		2.6%	97.0%	0.0%	0.4%		67.7%	0.0%	31.3%	1.0%		0.0%	84.7%	14.6%	0.6%		
PHF	.000	.000	.000	.000	.000	.517	.935	.000	.313	.920	.813	.000	.750	.250	.923	.000	.901	.802	.375	.933	.942

PM PEAK HOUR	Scarlett Dr Southbound					Dublin Blvd Westbound					Scarlett Dr Northbound					Dublin Blvd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	0	0	0	0	0	4	352	0	1	357	32	0	13	0	45	0	388	9	6	403	805
17:15	0	0	0	0	0	4	401	0	1	406	17	0	11	1	29	0	457	8	0	465	900
17:30	0	0	0	0	0	4	418	0	3	425	19	0	19	0	38	0	408	3	4	415	878
17:45	0	0	0	0	0	5	437	0	1	443	16	0	9	1	26	0	364	1	4	369	838
Total Volume	0	0	0	0	0	17	1608	0	6	1631	84	0	52	2	138	0	1617	21	14	1652	3421
% App Total	0.0%	0.0%	0.0%	0.0%		1.0%	98.6%	0.0%	0.4%		60.9%	0.0%	37.7%	1.4%		0.0%	97.9%	1.3%	0.8%		
PHF	.000	.000	.000	.000	.000	.850	.920	.000	.500	.920	.656	.000	.684	.500	.767	.000	.885	.583	.583	.888	.950

ALL TRAFFIC DATA

City of Dublin
All Vehicles & Uturns On Unshifted
Nothing On Bank 1
Nothing On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7377-006 DeMarcus Blvd & Dublin Blvd
Date : 5/24/2016

Unshifted Count = All Vehicles & Uturns

	DeMarcus Blvd Southbound					Dublin Blvd Westbound					DeMarcus Blvd Northbound					Dublin Blvd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
6:30	0	0	0	0	0	7	79	0	0	86	14	0	9	0	23	0	90	20	3	113	222	3
6:45	0	0	0	0	0	10	101	0	1	112	21	0	16	0	37	0	138	37	2	177	326	3
7:00	0	0	0	0	0	10	136	0	0	146	21	0	6	0	27	0	133	40	2	175	348	2
7:15	0	0	0	0	0	4	186	0	0	190	14	0	14	0	28	0	191	46	5	242	460	5
Total	0	0	0	0	0	31	502	0	1	534	70	0	45	0	115	0	552	143	12	707	1356	13
7:30	0	0	0	0	0	10	280	0	0	290	37	0	9	0	46	0	175	49	8	232	568	8
7:45	0	0	0	0	0	8	268	0	0	276	24	0	18	0	42	0	171	31	7	209	527	7
8:00	0	0	0	0	0	12	234	0	0	246	28	0	15	1	44	0	181	42	13	236	526	14
8:15	0	0	0	0	0	10	273	0	0	283	37	0	18	1	56	0	138	27	10	175	514	11
Total	0	0	0	0	0	40	1055	0	0	1095	126	0	60	2	188	0	665	149	38	852	2135	40
16:30	0	0	0	0	0	6	253	0	0	259	33	0	8	0	41	0	355	36	3	394	694	3
16:45	0	0	0	0	0	11	309	0	0	320	20	0	9	0	29	0	402	32	3	437	786	3
17:00	0	0	0	0	0	9	331	0	0	340	24	0	13	0	37	0	372	34	4	410	787	4
17:15	0	0	0	0	0	13	387	0	0	400	27	0	12	0	39	0	409	46	5	460	899	5
Total	0	0	0	0	0	39	1280	0	0	1319	104	0	42	0	146	0	1538	148	15	1701	3166	15
17:30	0	0	0	0	0	9	412	0	0	421	23	0	14	1	38	0	391	35	0	426	885	1
17:45	0	0	0	0	0	17	402	0	0	419	24	0	20	0	44	0	334	44	4	382	845	4
18:00	0	0	0	0	0	13	323	0	1	337	31	0	23	0	54	0	335	55	4	394	785	5
18:15	0	0	0	0	0	15	354	0	1	370	25	0	13	1	39	0	277	34	0	311	720	2
Total	0	0	0	0	0	54	1491	0	2	1547	103	0	70	2	175	0	1337	168	8	1513	3235	12
Grand Total	0	0	0	0	0	164	4328	0	3	4495	403	0	217	4	624	0	4092	608	73	4773	9892	80
Apprch %	0.0%	0.0%	0.0%	0.0%		3.6%	96.3%	0.0%	0.1%		64.6%	0.0%	34.8%	0.6%		0.0%	85.7%	12.7%	1.5%			
Total %	0.0%	0.0%	0.0%	0.0%	0.0%	1.7%	43.8%	0.0%	0.0%	45.4%	4.1%	0.0%	2.2%	0.0%	6.3%	0.0%	41.4%	6.1%	0.7%	48.3%	100.0%	

AM PEAK HOUR	DeMarcus Blvd Southbound					Dublin Blvd Westbound					DeMarcus Blvd Northbound					Dublin Blvd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:30 to 08:30																					
Peak Hour For Entire Intersection Begins at 07:30																					
7:30	0	0	0	0	0	10	280	0	0	290	37	0	9	0	46	0	175	49	8	232	568
7:45	0	0	0	0	0	8	268	0	0	276	24	0	18	0	42	0	171	31	7	209	527
8:00	0	0	0	0	0	12	234	0	0	246	28	0	15	1	44	0	181	42	13	236	526
8:15	0	0	0	0	0	10	273	0	0	283	37	0	18	1	56	0	138	27	10	175	514
Total Volume	0	0	0	0	0	40	1055	0	0	1095	126	0	60	2	188	0	665	149	38	852	2135
% App Total	0.0%	0.0%	0.0%	0.0%		3.7%	96.3%	0.0%	0.0%		67.0%	0.0%	31.9%	1.1%		0.0%	78.1%	17.5%	4.5%		
PHF	.000	.000	.000	.000	.000	.833	.942	.000	.000	.944	.851	.000	.833	.500	.839	.000	.919	.760	.731	.903	.940

PM PEAK HOUR	DeMarcus Blvd Southbound					Dublin Blvd Westbound					DeMarcus Blvd Northbound					Dublin Blvd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	0	0	0	0	0	9	331	0	0	340	24	0	13	0	37	0	372	34	4	410	787
17:15	0	0	0	0	0	13	387	0	0	400	27	0	12	0	39	0	409	46	5	460	899
17:30	0	0	0	0	0	9	412	0	0	421	23	0	14	1	38	0	391	35	0	426	885
17:45	0	0	0	0	0	17	402	0	0	419	24	0	20	0	44	0	334	44	4	382	845
Total Volume	0	0	0	0	0	48	1532	0	0	1580	98	0	59	1	158	0	1506	159	13	1678	3416
% App Total	0.0%	0.0%	0.0%	0.0%		3.0%	97.0%	0.0%	0.0%		62.0%	0.0%	37.3%	0.6%		0.0%	89.7%	9.5%	0.8%		
PHF	.000	.000	.000	.000	.000	.706	.930	.000	.000	.938	.907	.000	.738	.250	.898	.000	.921	.864	.650	.912	.950

ALL TRAFFIC DATA

(916) 771-8700
orders@atdtraffic.com

City of Dublin
All Vehicles & Uturns On Unshifted
Nothing On Bank 1
Nothing On Bank 2

File Name : 16-7377-007 Iron Horse Pkwy & Dublin Blvd
Date : 5/24/2016

Unshifted Count = All Vehicles & Uturns

	Iron Horse Pkwy Southbound					Dublin Blvd Westbound					Iron Horse Pkwy Northbound					Dublin Blvd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
6:30	0	0	0	0	0	15	78	0	0	93	10	0	10	0	20	0	66	40	0	106	219	0
6:45	0	0	0	0	0	13	83	0	0	96	26	0	5	0	31	0	77	76	0	153	280	0
7:00	0	0	0	0	0	18	123	0	0	141	24	0	5	0	29	0	77	72	0	149	319	0
7:15	0	0	0	0	0	22	156	0	0	178	33	0	7	0	40	0	118	88	0	206	424	0
Total	0	0	0	0	0	68	440	0	0	508	93	0	27	0	120	0	338	276	0	614	1242	0
7:30	0	0	0	0	0	20	255	0	0	275	29	0	11	0	40	0	138	52	0	190	505	0
7:45	0	0	0	0	0	18	252	0	1	271	28	0	14	0	42	0	162	23	0	185	498	1
8:00	0	0	0	0	0	12	201	0	1	214	41	0	16	0	57	0	177	30	0	207	478	1
8:15	0	0	0	0	0	9	238	0	0	247	42	0	13	0	55	0	134	27	0	161	463	0
Total	0	0	0	0	0	59	946	0	2	1007	140	0	54	0	194	0	611	132	0	743	1944	2
16:30	0	0	0	0	0	8	235	0	1	244	22	0	19	0	41	0	351	20	0	371	656	1
16:45	0	0	0	0	0	8	270	0	0	278	48	0	14	0	62	0	380	14	0	394	734	0
17:00	0	0	0	0	0	14	301	0	0	315	48	0	21	0	69	0	372	17	0	389	773	0
17:15	0	0	0	0	0	12	334	0	0	346	56	0	13	0	69	0	404	25	0	429	844	0
Total	0	0	0	0	0	42	1140	0	1	1183	174	0	67	0	241	0	1507	76	0	1583	3007	1
17:30	0	0	0	0	0	19	358	0	0	377	68	0	19	0	87	0	402	20	0	422	886	0
17:45	0	0	0	0	0	20	344	0	0	364	70	0	18	0	88	0	351	26	0	377	829	0
18:00	0	0	0	0	0	15	266	0	0	281	60	0	28	0	88	0	335	25	0	360	729	0
18:15	0	0	0	0	0	15	296	0	1	312	78	0	16	0	94	0	276	11	0	287	693	1
Total	0	0	0	0	0	69	1264	0	1	1334	276	0	81	0	357	0	1364	82	0	1446	3137	1
Grand Total	0	0	0	0	0	238	3790	0	4	4032	683	0	229	0	912	0	3820	566	0	4386	9330	4
Apprch %	0.0%	0.0%	0.0%	0.0%		5.9%	94.0%	0.0%	0.1%		74.9%	0.0%	25.1%	0.0%		0.0%	87.1%	12.9%	0.0%			
Total %	0.0%	0.0%	0.0%	0.0%	0.0%	2.6%	40.6%	0.0%	0.0%	43.2%	7.3%	0.0%	2.5%	0.0%	9.8%	0.0%	40.9%	6.1%	0.0%	47.0%	100.0%	

AM PEAK HOUR	Iron Horse Pkwy Southbound					Dublin Blvd Westbound					Iron Horse Pkwy Northbound					Dublin Blvd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:30 to 08:30																					
Peak Hour For Entire Intersection Begins at 07:30																					
7:30	0	0	0	0	0	20	255	0	0	275	29	0	11	0	40	0	138	52	0	190	505
7:45	0	0	0	0	0	18	252	0	1	271	28	0	14	0	42	0	162	23	0	185	498
8:00	0	0	0	0	0	12	201	0	1	214	41	0	16	0	57	0	177	30	0	207	478
8:15	0	0	0	0	0	9	238	0	0	247	42	0	13	0	55	0	134	27	0	161	463
Total Volume	0	0	0	0	0	59	946	0	2	1007	140	0	54	0	194	0	611	132	0	743	1944
% App Total	0.0%	0.0%	0.0%	0.0%		5.9%	93.9%	0.0%	0.2%		72.2%	0.0%	27.8%	0.0%		0.0%	82.2%	17.8%	0.0%		
PHF	.000	.000	.000	.000	.000	.738	.927	.000	.500	.915	.833	.000	.844	.000	.851	.000	.863	.635	.000	.897	.962

PM PEAK HOUR	Iron Horse Pkwy Southbound					Dublin Blvd Westbound					Iron Horse Pkwy Northbound					Dublin Blvd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	0	0	0	0	0	14	301	0	0	315	48	0	21	0	69	0	372	17	0	389	773
17:15	0	0	0	0	0	12	334	0	0	346	56	0	13	0	69	0	404	25	0	429	844
17:30	0	0	0	0	0	19	358	0	0	377	68	0	19	0	87	0	402	20	0	422	886
17:45	0	0	0	0	0	20	344	0	0	364	70	0	18	0	88	0	351	26	0	377	829
Total Volume	0	0	0	0	0	65	1337	0	0	1402	242	0	71	0	313	0	1529	88	0	1617	3332
% App Total	0.0%	0.0%	0.0%	0.0%		4.6%	95.4%	0.0%	0.0%		77.3%	0.0%	22.7%	0.0%		0.0%	94.6%	5.4%	0.0%		
PHF	.000	.000	.000	.000	.000	.813	.934	.000	.000	.930	.864	.000	.845	.000	.889	.000	.946	.846	.000	.942	.940

ALL TRAFFIC DATA

(916) 771-8700
orders@atdtraffic.com

City of Dublin
All Vehicles & Uturns On Unshifted
Nothing On Bank 1
Nothing On Bank 2

File Name : 16-7377-008 Arnold Rd & Dublin Blvd
Date : 5/24/2016

Unshifted Count = All Vehicles & Uturns

	Arnold Rd Southbound					Dublin Blvd Westbound					Arnold Rd Northbound					Dublin Blvd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
6:30	3	16	22	0	41	8	66	2	1	77	0	1	2	0	3	36	41	0	0	77	198	1
6:45	3	24	21	0	48	11	73	7	2	93	2	8	5	0	15	28	49	0	2	79	235	4
7:00	5	32	39	0	76	19	104	15	1	139	5	2	8	0	15	20	57	2	2	81	311	3
7:15	3	37	47	0	87	22	135	7	0	164	2	0	4	0	6	54	74	4	0	132	389	0
Total	14	109	129	0	252	60	378	31	4	473	9	11	19	0	39	138	221	6	4	369	1133	8
7:30	3	17	114	0	134	14	164	6	2	186	2	1	4	0	7	50	101	1	0	152	479	2
7:45	1	20	101	0	122	4	156	10	1	171	8	10	3	0	21	54	111	0	0	165	479	1
8:00	3	24	76	0	103	5	143	6	0	154	0	5	8	0	13	54	149	2	0	205	475	0
8:15	2	21	87	0	110	4	167	7	0	178	3	5	7	0	15	37	106	2	0	145	448	0
Total	9	82	378	0	469	27	630	29	3	689	13	21	22	0	56	195	467	5	0	667	1881	3
16:30	9	6	76	0	91	2	165	8	2	177	10	8	17	0	35	58	302	14	1	375	678	3
16:45	8	7	70	0	85	6	195	3	0	204	11	21	8	0	40	71	317	10	0	398	727	0
17:00	7	10	94	0	111	5	198	4	0	207	23	15	14	0	52	63	325	10	1	399	769	1
17:15	4	8	87	0	99	4	254	7	1	266	12	20	23	0	55	61	334	14	0	409	829	1
Total	28	31	327	0	386	17	812	22	3	854	56	64	62	0	182	253	1278	48	2	1581	3003	5
17:30	11	12	101	0	124	3	263	6	2	274	18	20	14	0	52	68	332	19	2	421	871	4
17:45	9	12	95	0	116	5	254	4	2	265	17	26	23	0	66	67	283	13	1	364	811	3
18:00	17	6	58	0	81	1	197	3	1	202	16	19	20	0	55	51	303	15	2	371	709	3
18:15	4	8	88	0	100	3	224	5	0	232	10	22	18	0	50	42	240	12	1	295	677	1
Total	41	38	342	0	421	12	938	18	5	973	61	87	75	0	223	228	1158	59	6	1451	3068	11
Grand Total	92	260	1176	0	1528	116	2758	100	15	2989	139	183	178	0	500	814	3124	118	12	4068	9085	27
Apprch %	6.0%	17.0%	77.0%	0.0%		3.9%	92.3%	3.3%	0.5%		27.8%	36.6%	35.6%	0.0%		20.0%	76.8%	2.9%	0.3%			
Total %	1.0%	2.9%	12.9%	0.0%	16.8%	1.3%	30.4%	1.1%	0.2%	32.9%	1.5%	2.0%	2.0%	0.0%	5.5%	9.0%	34.4%	1.3%	0.1%	44.8%	100.0%	

AM PEAK HOUR	Arnold Rd Southbound					Dublin Blvd Westbound					Arnold Rd Northbound					Dublin Blvd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:30 to 08:30																					
Peak Hour For Entire Intersection Begins at 07:30																					
7:30	3	17	114	0	134	14	164	6	2	186	2	1	4	0	7	50	101	1	0	152	479
7:45	1	20	101	0	122	4	156	10	1	171	8	10	3	0	21	54	111	0	0	165	479
8:00	3	24	76	0	103	5	143	6	0	154	0	5	8	0	13	54	149	2	0	205	475
8:15	2	21	87	0	110	4	167	7	0	178	3	5	7	0	15	37	106	2	0	145	448
Total Volume	9	82	378	0	469	27	630	29	3	689	13	21	22	0	56	195	467	5	0	667	1881
% App Total	1.9%	17.5%	80.6%	0.0%		3.9%	91.4%	4.2%	0.4%		23.2%	37.5%	39.3%	0.0%		29.2%	70.0%	0.7%	0.0%		
PHF	.750	.854	.829	.000	.875	.482	.943	.725	.375	.926	.406	.525	.688	.000	.667	.903	.784	.625	.000	.813	.982

PM PEAK HOUR	Arnold Rd Southbound					Dublin Blvd Westbound					Arnold Rd Northbound					Dublin Blvd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	7	10	94	0	111	5	198	4	0	207	23	15	14	0	52	63	325	10	1	399	769
17:15	4	8	87	0	99	4	254	7	1	266	12	20	23	0	55	61	334	14	0	409	829
17:30	11	12	101	0	124	3	263	6	2	274	18	20	14	0	52	68	332	19	2	421	871
17:45	9	12	95	0	116	5	254	4	2	265	17	26	23	0	66	67	283	13	1	364	811
Total Volume	31	42	377	0	450	17	969	21	5	1012	70	81	74	0	225	259	1274	56	4	1593	3280
% App Total	6.9%	9.3%	83.8%	0.0%		1.7%	95.8%	2.1%	0.5%		31.1%	36.0%	32.9%	0.0%		16.3%	80.0%	3.5%	0.3%		
PHF	.705	.875	.933	.000	.907	.850	.921	.750	.625	.923	.761	.779	.804	.000	.852	.952	.954	.737	.500	.946	.941

ALL TRAFFIC DATA

City of Dublin
All Vehicles & Uturns On Unshifted
Nothing On Bank 1
Nothing On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7377-009 Arnold Rd & Central Pkwy
Date : 5/24/2016

Unshifted Count = All Vehicles & Uturns

	Arnold Rd Southbound					Central Pkwy Westbound					Arnold Rd Northbound					Central Pkwy Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
6:30	1	31	0	0	32	9	0	0	0	9	0	29	10	0	39	0	0	0	0	0	80	0
6:45	1	37	0	0	38	12	0	1	0	13	0	34	6	0	40	0	0	0	0	0	91	0
7:00	2	60	0	0	62	19	0	1	0	20	0	28	5	0	33	0	0	0	0	0	115	0
7:15	3	75	0	0	78	17	0	0	0	17	0	42	16	0	58	0	0	0	0	0	153	0
Total	7	203	0	0	210	57	0	2	0	59	0	133	37	0	170	0	0	0	0	0	439	0
7:30	2	107	0	0	109	27	0	0	0	27	0	37	11	0	48	0	0	0	0	0	184	0
7:45	4	102	0	0	106	23	0	0	0	23	0	48	15	0	63	0	0	0	0	0	192	0
8:00	0	88	0	0	88	16	0	0	0	16	0	53	11	0	64	0	0	0	0	0	168	0
8:15	2	87	0	0	89	22	0	0	1	23	0	39	10	0	49	0	0	0	0	0	161	1
Total	8	384	0	0	392	88	0	0	1	89	0	177	47	0	224	0	0	0	0	0	705	1
16:30	2	64	0	0	66	25	0	1	0	26	0	61	16	0	77	0	0	0	0	0	169	0
16:45	2	58	0	0	60	30	0	0	0	30	0	77	20	0	97	0	0	0	0	0	187	0
17:00	0	75	0	0	75	34	0	1	0	35	0	69	16	0	85	0	0	0	0	0	195	0
17:15	0	66	0	0	66	33	0	0	0	33	0	71	18	0	89	0	0	0	0	0	188	0
Total	4	263	0	0	267	122	0	2	0	124	0	278	70	0	348	0	0	0	0	0	739	0
17:30	1	88	0	0	89	43	0	0	2	45	0	73	22	0	95	0	0	0	0	0	229	2
17:45	2	69	0	0	71	35	0	0	0	35	0	76	23	0	99	0	0	0	0	0	205	0
18:00	1	58	0	0	59	21	0	1	0	22	0	61	12	0	73	0	0	0	0	0	154	0
18:15	1	68	0	0	69	31	0	0	0	31	0	59	14	0	73	0	0	0	0	0	173	0
Total	5	283	0	0	288	130	0	1	2	133	0	269	71	0	340	0	0	0	0	0	761	2
Grand Total	24	1133	0	0	1157	397	0	5	3	405	0	857	225	0	1082	0	0	0	0	0	2644	3
Apprch %	2.1%	97.9%	0.0%	0.0%		98.0%	0.0%	1.2%	0.7%		0.0%	79.2%	20.8%	0.0%		0.0%	0.0%	0.0%	0.0%			
Total %	0.9%	42.9%	0.0%	0.0%	43.8%	15.0%	0.0%	0.2%	0.1%	15.3%	0.0%	32.4%	8.5%	0.0%	40.9%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	

AM PEAK HOUR	Arnold Rd Southbound					Central Pkwy Westbound					Arnold Rd Northbound					Central Pkwy Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:30 to 08:30																					
Peak Hour For Entire Intersection Begins at 07:30																					
7:30	2	107	0	0	109	27	0	0	0	27	0	37	11	0	48	0	0	0	0	0	184
7:45	4	102	0	0	106	23	0	0	0	23	0	48	15	0	63	0	0	0	0	0	192
8:00	0	88	0	0	88	16	0	0	0	16	0	53	11	0	64	0	0	0	0	0	168
8:15	2	87	0	0	89	22	0	0	1	23	0	39	10	0	49	0	0	0	0	0	161
Total Volume	8	384	0	0	392	88	0	0	1	89	0	177	47	0	224	0	0	0	0	0	705
% App Total	2.0%	98.0%	0.0%	0.0%		98.9%	0.0%	0.0%	1.1%		0.0%	79.0%	21.0%	0.0%		0.0%	0.0%	0.0%	0.0%		
PHF	.500	.897	.000	.000	.899	.815	.000	.000	.250	.824	.000	.835	.783	.000	.875	.000	.000	.000	.000	.000	.918

PM PEAK HOUR	Arnold Rd Southbound					Central Pkwy Westbound					Arnold Rd Northbound					Central Pkwy Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	0	75	0	0	75	34	0	1	0	35	0	69	16	0	85	0	0	0	0	0	195
17:15	0	66	0	0	66	33	0	0	0	33	0	71	18	0	89	0	0	0	0	0	188
17:30	1	88	0	0	89	43	0	0	2	45	0	73	22	0	95	0	0	0	0	0	229
17:45	2	69	0	0	71	35	0	0	0	35	0	76	23	0	99	0	0	0	0	0	205
Total Volume	3	298	0	0	301	145	0	1	2	148	0	289	79	0	368	0	0	0	0	0	817
% App Total	1.0%	99.0%	0.0%	0.0%		98.0%	0.0%	0.7%	1.4%		0.0%	78.5%	21.5%	0.0%		0.0%	0.0%	0.0%	0.0%		
PHF	.375	.847	.000	.000	.846	.843	.000	.250	.250	.822	.000	.951	.859	.000	.929	.000	.000	.000	.000	.000	.892

ALL TRAFFIC DATA

City of Dublin
All Vehicles & Uturns On Unshifted
Nothing On Bank 1
Nothing On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7377-010 Hacienda Dr & Gleason Dr
Date : 5/24/2016

Unshifted Count = All Vehicles & Uturns

	Hacienda Dr Southbound					Gleason Dr Westbound					Hacienda Dr Northbound					Gleason Dr Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
6:30	0	0	0	0	0	10	28	0	0	38	15	0	27	2	44	0	3	1	0	4	86	2
6:45	0	0	0	0	0	12	37	0	0	49	18	0	36	3	57	0	9	3	0	12	118	3
7:00	0	0	0	0	0	17	57	0	0	74	11	0	25	0	36	0	6	2	0	8	118	0
7:15	0	0	0	0	0	33	68	0	0	101	6	0	18	0	24	0	14	2	0	16	141	0
Total	0	0	0	0	0	72	190	0	0	262	50	0	106	5	161	0	32	8	0	40	463	5
7:30	0	0	0	0	0	35	108	0	0	143	11	0	40	1	52	0	19	2	0	21	216	1
7:45	0	0	0	0	0	52	94	0	0	146	5	0	40	0	45	0	31	3	0	34	225	0
8:00	0	0	0	0	0	87	74	0	1	162	3	0	53	5	61	0	34	5	1	40	263	7
8:15	0	0	0	0	0	112	87	0	1	200	3	0	71	4	78	0	17	4	0	21	299	5
Total	0	0	0	0	0	286	363	0	2	651	22	0	204	10	236	0	101	14	1	116	1003	13
16:30	0	0	0	0	0	61	43	0	1	105	3	0	55	1	59	0	63	6	0	69	233	2
16:45	0	0	0	0	0	16	39	0	0	55	5	0	67	1	73	0	67	4	0	71	199	1
17:00	0	0	0	0	0	27	37	0	2	66	2	0	64	0	66	0	67	8	0	75	207	2
17:15	0	0	0	0	0	16	46	0	2	64	4	0	71	0	75	0	72	2	0	74	213	2
Total	0	0	0	0	0	120	165	0	5	290	14	0	257	2	273	0	269	20	0	289	852	7
17:30	0	0	0	0	0	18	56	0	3	77	2	0	92	1	95	0	68	3	0	71	243	4
17:45	0	0	0	0	0	20	53	0	0	73	4	0	95	0	99	0	67	3	0	70	242	0
18:00	0	0	0	0	0	18	36	0	0	54	3	0	78	0	81	0	63	7	0	70	205	0
18:15	0	0	0	0	0	17	47	0	0	64	2	0	44	0	46	0	56	3	0	59	169	0
Total	0	0	0	0	0	73	192	0	3	268	11	0	309	1	321	0	254	16	0	270	859	4
Grand Total	0	0	0	0	0	551	910	0	10	1471	97	0	876	18	991	0	656	58	1	715	3177	29
Apprch %	0.0%	0.0%	0.0%	0.0%		37.5%	61.9%	0.0%	0.7%		9.8%	0.0%	88.4%	1.8%		0.0%	91.7%	8.1%	0.1%			
Total %	0.0%	0.0%	0.0%	0.0%	0.0%	17.3%	28.6%	0.0%	0.3%	46.3%	3.1%	0.0%	27.6%	0.6%	31.2%	0.0%	20.6%	1.8%	0.0%	22.5%	100.0%	

AM PEAK HOUR	Hacienda Dr Southbound					Gleason Dr Westbound					Hacienda Dr Northbound					Gleason Dr Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:30 to 08:30																					
Peak Hour For Entire Intersection Begins at 07:30																					
7:30	0	0	0	0	0	35	108	0	0	143	11	0	40	1	52	0	19	2	0	21	216
7:45	0	0	0	0	0	52	94	0	0	146	5	0	40	0	45	0	31	3	0	34	225
8:00	0	0	0	0	0	87	74	0	1	162	3	0	53	5	61	0	34	5	1	40	263
8:15	0	0	0	0	0	112	87	0	1	200	3	0	71	4	78	0	17	4	0	21	299
Total Volume	0	0	0	0	0	286	363	0	2	651	22	0	204	10	236	0	101	14	1	116	1003
% App Total	0.0%	0.0%	0.0%	0.0%		43.9%	55.8%	0.0%	0.3%		9.3%	0.0%	86.4%	4.2%		0.0%	87.1%	12.1%	0.9%		
PHF	.000	.000	.000	.000	.000	.638	.840	.000	.500	.814	.500	.000	.718	.500	.756	.000	.743	.700	.250	.725	.839

PM PEAK HOUR	Hacienda Dr Southbound					Gleason Dr Westbound					Hacienda Dr Northbound					Gleason Dr Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	0	0	0	0	0	27	37	0	2	66	2	0	64	0	66	0	67	8	0	75	207
17:15	0	0	0	0	0	16	46	0	2	64	4	0	71	0	75	0	72	2	0	74	213
17:30	0	0	0	0	0	18	56	0	3	77	2	0	92	1	95	0	68	3	0	71	243
17:45	0	0	0	0	0	20	53	0	0	73	4	0	95	0	99	0	67	3	0	70	242
Total Volume	0	0	0	0	0	81	192	0	7	280	12	0	322	1	335	0	274	16	0	290	905
% App Total	0.0%	0.0%	0.0%	0.0%		28.9%	68.6%	0.0%	2.5%		3.6%	0.0%	96.1%	0.3%		0.0%	94.5%	5.5%	0.0%		
PHF	.000	.000	.000	.000	.000	.750	.857	.000	.583	.909	.750	.000	.847	.250	.846	.000	.951	.500	.000	.967	.931

ALL TRAFFIC DATA

City of Dublin
All Vehicles & Uturns On Unshifted
Nothing On Bank 1
Nothing On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7377-013 Hacienda Dr & Digital Dr/Martinelli Wy
Date : 5/24/2016

Unshifted Count = All Vehicles & Uturns

	Hacienda Dr Southbound					Digital Dr/Martinelli Wy Westbound					Hacienda Dr Northbound					Digital Dr/Martinelli Wy Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
6:30	1	67	6	1	75	16	0	2	0	18	82	100	15	0	197	1	1	21	0	23	313	1
6:45	3	75	8	0	86	7	1	2	0	10	106	157	25	1	289	0	0	26	0	26	411	1
7:00	1	89	8	0	98	12	5	2	0	19	99	143	26	0	268	2	0	27	0	29	414	0
7:15	5	115	20	0	140	18	3	2	0	23	124	136	28	0	288	3	3	35	0	41	492	0
Total	10	346	42	1	399	53	9	8	0	70	411	536	94	1	1042	6	4	109	0	119	1630	2
7:30	4	137	8	0	149	23	6	3	0	32	64	177	29	0	270	1	3	33	0	37	488	0
7:45	3	146	10	0	159	27	3	2	0	32	55	183	29	0	267	2	1	33	0	36	494	0
8:00	2	183	5	0	190	25	4	4	0	33	67	223	34	0	324	1	0	45	0	46	593	0
8:15	2	188	14	0	204	16	3	3	0	22	48	241	29	0	318	2	4	41	0	47	591	0
Total	11	654	37	0	702	91	16	12	0	119	234	824	121	0	1179	6	8	152	0	166	2166	0
16:30	7	242	2	0	251	70	6	6	0	82	69	169	65	0	303	2	7	79	0	88	724	0
16:45	13	177	1	1	192	61	10	8	0	79	74	212	91	0	377	3	7	92	0	102	750	1
17:00	15	234	0	0	249	62	11	7	0	80	74	241	81	1	397	7	8	73	0	88	814	1
17:15	23	255	7	0	285	61	14	7	0	82	96	325	125	1	547	10	10	72	0	92	1006	1
Total	58	908	10	1	977	254	41	28	0	323	313	947	362	2	1624	22	32	316	0	370	3294	3
17:30	17	214	9	0	240	70	12	7	0	89	90	335	107	0	532	7	2	88	0	97	958	0
17:45	12	222	3	0	237	59	11	6	0	76	101	303	111	0	515	9	11	108	0	128	956	0
18:00	11	184	2	1	198	63	16	5	0	84	120	254	102	0	476	5	9	89	0	103	861	1
18:15	17	201	3	0	221	77	10	9	0	96	78	201	96	0	375	9	8	88	1	106	798	1
Total	57	821	17	1	896	269	49	27	0	345	389	1093	416	0	1898	30	30	373	1	434	3573	2
Grand Total	136	2729	106	3	2974	667	115	75	0	857	1347	3400	993	3	5743	64	74	950	1	1089	10663	7
Apprch %	4.6%	91.8%	3.6%	0.1%		77.8%	13.4%	8.8%	0.0%		23.5%	59.2%	17.3%	0.1%		5.9%	6.8%	87.2%	0.1%			
Total %	1.3%	25.6%	1.0%	0.0%	27.9%	6.3%	1.1%	0.7%	0.0%	8.0%	12.6%	31.9%	9.3%	0.0%	53.9%	0.6%	0.7%	8.9%	0.0%	10.2%	100.0%	

AM PEAK HOUR	Hacienda Dr Southbound					Digital Dr/Martinelli Wy Westbound					Hacienda Dr Northbound					Digital Dr/Martinelli Wy Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:30 to 08:30																					
Peak Hour For Entire Intersection Begins at 07:30																					
7:30	4	137	8	0	149	23	6	3	0	32	64	177	29	0	270	1	3	33	0	37	488
7:45	3	146	10	0	159	27	3	2	0	32	55	183	29	0	267	2	1	33	0	36	494
8:00	2	183	5	0	190	25	4	4	0	33	67	223	34	0	324	1	0	45	0	46	593
8:15	2	188	14	0	204	16	3	3	0	22	48	241	29	0	318	2	4	41	0	47	591
Total Volume	11	654	37	0	702	91	16	12	0	119	234	824	121	0	1179	6	8	152	0	166	2166
% App Total	1.6%	93.2%	5.3%	0.0%		76.5%	13.4%	10.1%	0.0%		19.8%	69.9%	10.3%	0.0%		3.6%	4.8%	91.6%	0.0%		
PHF	.688	.870	.661	.000	.860	.843	.667	.750	.000	.902	.873	.855	.890	.000	.910	.750	.500	.844	.000	.883	.913

PM PEAK HOUR	Hacienda Dr Southbound					Digital Dr/Martinelli Wy Westbound					Hacienda Dr Northbound					Digital Dr/Martinelli Wy Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:15 to 18:15																					
Peak Hour For Entire Intersection Begins at 17:15																					
17:15	23	255	7	0	285	61	14	7	0	82	96	325	125	1	547	10	10	72	0	92	1006
17:30	17	214	9	0	240	70	12	7	0	89	90	335	107	0	532	7	2	88	0	97	958
17:45	12	222	3	0	237	59	11	6	0	76	101	303	111	0	515	9	11	108	0	128	956
18:00	11	184	2	1	198	63	16	5	0	84	120	254	102	0	476	5	9	89	0	103	861
Total Volume	63	875	21	1	960	253	53	25	0	331	407	1217	445	1	2070	31	32	357	0	420	3781
% App Total	6.6%	91.1%	2.2%	0.1%		76.4%	16.0%	7.6%	0.0%		19.7%	58.8%	21.5%	0.0%		7.4%	7.6%	85.0%	0.0%		
PHF	.685	.858	.583	.250	.842	.904	.828	.893	.000	.930	.848	.908	.890	.250	.946	.775	.727	.826	.000	.820	.940

ALL TRAFFIC DATA

City of Dublin
All Vehicles & Uturns On Unshifted
Nothing On Bank 1
Nothing On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7377-018 Tassajara Rd & Dublin Blvd
Date : 5/24/2016

Unshifted Count = All Vehicles & Uturns

	Tassajara Rd Southbound					Dublin Blvd Westbound					Tassajara Rd Northbound					Dublin Blvd Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
6:30	0	86	10	0	96	50	46	1	0	97	35	74	19	0	128	5	11	23	0	39	360	0
6:45	3	117	13	0	133	65	64	9	0	138	42	77	14	0	133	8	11	22	0	41	445	0
7:00	4	157	27	0	188	89	77	3	0	169	53	78	15	0	146	5	16	15	1	37	540	1
7:15	2	160	16	1	179	96	119	10	0	225	52	109	22	0	183	16	20	29	0	65	652	1
Total	9	520	66	1	596	300	306	23	0	629	182	338	70	0	590	34	58	89	1	182	1997	2
7:30	2	210	31	0	243	94	107	6	0	207	58	115	16	0	189	14	21	31	3	69	708	3
7:45	4	191	24	0	219	139	126	9	0	274	60	124	28	1	213	15	25	50	1	91	797	2
8:00	7	212	28	1	248	108	130	8	0	246	52	118	39	0	209	27	30	39	0	96	799	1
8:15	10	259	29	0	298	119	116	8	0	243	68	94	28	0	190	18	28	47	2	95	826	2
Total	23	872	112	1	1008	460	479	31	0	970	238	451	111	1	801	74	104	167	6	351	3130	8
16:30	6	157	25	0	188	55	56	6	0	117	57	79	70	0	206	44	186	121	9	360	871	9
16:45	18	145	16	0	179	68	55	8	0	131	93	107	88	0	288	38	150	118	6	312	910	6
17:00	16	114	35	0	165	66	69	10	0	145	87	113	75	0	275	41	164	126	5	336	921	5
17:15	20	139	23	0	182	70	62	8	0	140	93	141	114	0	348	48	163	125	9	345	1015	9
Total	60	555	99	0	714	259	242	32	0	533	330	440	347	0	1117	171	663	490	29	1353	3717	29
17:30	16	136	36	0	188	63	71	6	0	140	87	141	120	0	348	49	249	125	13	436	1112	13
17:45	17	131	35	0	183	58	66	9	0	133	120	169	121	0	410	48	192	138	1	379	1105	1
18:00	23	128	20	2	173	50	70	11	0	131	104	153	127	0	384	50	204	147	5	406	1094	7
18:15	13	147	17	0	177	49	59	9	0	117	99	182	134	2	417	37	139	115	6	297	1008	8
Total	69	542	108	2	721	220	266	35	0	521	410	645	502	2	1559	184	784	525	25	1518	4319	29
Grand Total	161	2489	385	4	3039	1239	1293	121	0	2653	1160	1874	1030	3	4067	463	1609	1271	61	3404	13163	68
Apprch %	5.3%	81.9%	12.7%	0.1%		46.7%	48.7%	4.6%	0.0%		28.5%	46.1%	25.3%	0.1%		13.6%	47.3%	37.3%	1.8%			
Total %	1.2%	18.9%	2.9%	0.0%	23.1%	9.4%	9.8%	0.9%	0.0%	20.2%	8.8%	14.2%	7.8%	0.0%	30.9%	3.5%	12.2%	9.7%	0.5%	25.9%	100.0%	

AM PEAK HOUR	Tassajara Rd Southbound					Dublin Blvd Westbound					Tassajara Rd Northbound					Dublin Blvd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:30 to 08:30																					
Peak Hour For Entire Intersection Begins at 07:30																					
7:30	2	210	31	0	243	94	107	6	0	207	58	115	16	0	189	14	21	31	3	69	708
7:45	4	191	24	0	219	139	126	9	0	274	60	124	28	1	213	15	25	50	1	91	797
8:00	7	212	28	1	248	108	130	8	0	246	52	118	39	0	209	27	30	39	0	96	799
8:15	10	259	29	0	298	119	116	8	0	243	68	94	28	0	190	18	28	47	2	95	826
Total Volume	23	872	112	1	1008	460	479	31	0	970	238	451	111	1	801	74	104	167	6	351	3130
% App Total	2.3%	86.5%	11.1%	0.1%		47.4%	49.4%	3.2%	0.0%		29.7%	56.3%	13.9%	0.1%		21.1%	29.6%	47.6%	1.7%		
PHF	.575	.842	.903	.250	.846	.827	.921	.861	.000	.885	.875	.909	.712	.250	.940	.685	.867	.835	.500	.914	.947

PM PEAK HOUR	Tassajara Rd Southbound					Dublin Blvd Westbound					Tassajara Rd Northbound					Dublin Blvd Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:15 to 18:15																					
Peak Hour For Entire Intersection Begins at 17:15																					
17:15	20	139	23	0	182	70	62	8	0	140	93	141	114	0	348	48	163	125	9	345	1015
17:30	16	136	36	0	188	63	71	6	0	140	87	141	120	0	348	49	249	125	13	436	1112
17:45	17	131	35	0	183	58	66	9	0	133	120	169	121	0	410	48	192	138	1	379	1105
18:00	23	128	20	2	173	50	70	11	0	131	104	153	127	0	384	50	204	147	5	406	1094
Total Volume	76	534	114	2	726	241	269	34	0	544	404	604	482	0	1490	195	808	535	28	1566	4326
% App Total	10.5%	73.6%	15.7%	0.3%		44.3%	49.4%	6.3%	0.0%		27.1%	40.5%	32.3%	0.0%		12.5%	51.6%	34.2%	1.8%		
PHF	.826	.960	.792	.250	.965	.861	.947	.773	.000	.971	.842	.893	.949	.000	.909	.975	.811	.910	.538	.898	.973

ALL TRAFFIC DATA

City of Dublin
All Vehicles & Uturns On Unshifted
Nothing On Bank 1
Nothing On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7377-019 Tassajara Rd & I-580 WB Off Ramp
Date : 5/24/2016

Unshifted Count = All Vehicles & Uturns

	Tassajara Rd Southbound					I-580 WB Off Ramp Westbound					Tassajara Rd Northbound					I-580 WB Off Ramp Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
6:30	0	60	0	0	60	80	0	58	0	138	0	109	0	0	109	0	0	0	0	0	307	0
6:45	0	100	0	0	100	76	0	69	0	145	0	131	0	0	131	0	0	0	0	0	376	0
7:00	0	90	0	0	90	99	0	63	0	162	0	143	0	0	143	0	0	0	0	0	395	0
7:15	0	125	0	0	125	104	0	61	0	165	0	188	0	0	188	0	0	0	0	0	478	0
Total	0	375	0	0	375	359	0	251	0	610	0	571	0	0	571	0	0	0	0	0	1556	0
7:30	0	158	0	0	158	110	0	56	0	166	0	178	0	0	178	0	0	0	0	0	502	0
7:45	0	164	0	0	164	149	0	80	0	229	0	238	0	0	238	0	0	0	0	0	631	0
8:00	0	202	0	0	202	152	0	56	0	208	0	263	0	0	263	0	0	0	0	0	673	0
8:15	0	193	0	0	193	115	0	78	0	193	0	241	0	0	241	0	0	0	0	0	627	0
Total	0	717	0	0	717	526	0	270	0	796	0	920	0	0	920	0	0	0	0	0	2433	0
8:30	0	236	0	0	236	130	0	70	0	200	0	269	0	0	269	0	0	0	0	0	705	0
8:45	0	216	0	0	216	144	0	51	0	195	0	280	0	0	280	0	0	0	0	0	691	0
9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	452	0	0	452	274	0	121	0	395	0	549	0	0	549	0	0	0	0	0	1396	0
16:00	0	310	0	0	310	79	0	62	0	141	0	194	0	0	194	0	0	0	0	0	645	0
16:15	0	241	0	0	241	89	0	58	0	147	0	231	0	0	231	0	0	0	0	0	619	0
16:30	0	300	0	0	300	83	0	49	0	132	0	205	0	0	205	0	0	0	0	0	637	0
16:45	0	286	0	0	286	108	0	54	0	162	0	263	0	0	263	0	0	0	0	0	711	0
Total	0	1137	0	0	1137	359	0	223	0	582	0	893	0	0	893	0	0	0	0	0	2612	0
17:00	0	273	0	0	273	106	0	62	0	168	0	250	0	0	250	0	0	0	0	0	691	0
17:15	0	263	0	0	263	150	0	67	0	217	0	302	0	0	302	0	0	0	0	0	782	0
17:30	0	274	0	0	274	117	0	46	0	163	0	346	0	0	346	0	0	0	0	0	783	0
17:45	0	289	0	0	289	130	0	59	0	189	0	365	0	0	365	0	0	0	0	0	843	0
Total	0	1099	0	0	1099	503	0	234	0	737	0	1263	0	0	1263	0	0	0	0	0	3099	0
18:00	0	298	0	0	298	103	0	53	0	156	0	385	0	0	385	0	0	0	0	0	839	0
18:15	0	226	0	0	226	92	0	42	0	134	0	331	0	0	331	0	0	0	0	0	691	0
18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	524	0	0	524	195	0	95	0	290	0	716	0	0	716	0	0	0	0	0	1530	0
Grand Total	0	4304	0	0	4304	2216	0	1194	0	3410	0	4912	0	0	4912	0	0	0	0	0	12626	0
Apprch %	0.0%	100.0%	0.0%	0.0%		65.0%	0.0%	35.0%	0.0%		0.0%	100.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%			
Total %	0.0%	34.1%	0.0%	0.0%	34.1%	17.6%	0.0%	9.5%	0.0%	27.0%	0.0%	38.9%	0.0%	0.0%	38.9%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	

AM PEAK HOUR	Tassajara Rd Southbound					I-580 WB Off Ramp Westbound					Tassajara Rd Northbound					I-580 WB Off Ramp Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
8:00	0	202	0	0	202	152	0	56	0	208	0	263	0	0	263	0	0	0	0	0	673
8:15	0	193	0	0	193	115	0	78	0	193	0	241	0	0	241	0	0	0	0	0	627
8:30	0	236	0	0	236	130	0	70	0	200	0	269	0	0	269	0	0	0	0	0	705
8:45	0	216	0	0	216	144	0	51	0	195	0	280	0	0	280	0	0	0	0	0	691
Total Volume	0	847	0	0	847	541	0	255	0	796	0	1053	0	0	1053	0	0	0	0	0	2696
% App Total	0.0%	100.0%	0.0%	0.0%		68.0%	0.0%	32.0%	0.0%		0.0%	100.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		
PHF	.000	.897	.000	.000	.897	.890	.000	.817	.000	.957	.000	.940	.000	.000	.940	.000	.000	.000	.000	.000	.956

PM PEAK HOUR	Tassajara Rd Southbound					I-580 WB Off Ramp Westbound					Tassajara Rd Northbound					I-580 WB Off Ramp Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:15 to 18:15																					
Peak Hour For Entire Intersection Begins at 17:15																					
17:15	0	263	0	0	263	150	0	67	0	217	0	302	0	0	302	0	0	0	0	0	782
17:30	0	274	0	0	274	117	0	46	0	163	0	346	0	0	346	0	0	0	0	0	783
17:45	0	289	0	0	289	130	0	59	0	189	0	365	0	0	365	0	0	0	0	0	843
18:00	0	298	0	0	298	103	0	53	0	156	0	385	0	0	385	0	0	0	0	0	839
Total Volume	0	1124	0	0	1124	500	0	225	0	725	0	1398	0	0	1398	0	0	0	0	0	3247
% App Total	0.0%	100.0%	0.0%	0.0%		69.0%	0.0%	31.0%	0.0%		0.0%	100.0%	0.0%	0.0%		0.0%	0.0%	0.0%	0.0%		
PHF	.000	.943	.000	.000	.943	.833	.000	.840	.000	.835	.000	.908	.000	.000	.908	.000	.000	.000	.000	.000	.963

ALL TRAFFIC DATA

(916) 771-8700
orders@atdtraffic.com

City of Dublin
All Vehicles & Uturns On Unshifted
Nothing On Bank 1
Nothing On Bank 2

File Name : 16-7377-020 Tassajara Rd & I-580 EB Off Ramp/Pimlico Dr
Date : 5/24/2016

Unshifted Count = All Vehicles & Uturns

	Tassajara Rd Southbound					I-580 EB Off Ramp/Pimlico Dr Westbound					Tassajara Rd Northbound					I-580 EB Off Ramp/Pimlico Dr Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturns Total
6:30	20	105	0	0	125	10	0	56	0	66	0	109	9	0	118	75	29	123	0	227	536	0
6:45	15	134	0	0	149	28	0	69	0	97	0	140	5	0	145	83	22	139	0	244	635	0
7:00	19	155	0	0	174	20	0	75	0	95	0	162	9	0	171	85	22	108	0	215	655	0
7:15	30	178	0	1	209	27	0	70	0	97	0	182	10	0	192	116	22	120	0	258	756	1
Total	84	572	0	1	657	85	0	270	0	355	0	593	33	0	626	359	95	490	0	944	2582	1
7:30	34	202	0	0	236	28	0	78	0	106	0	186	12	0	198	104	20	164	0	288	828	0
7:45	35	254	0	0	289	38	0	87	0	125	0	182	6	0	188	148	28	211	0	387	989	0
8:00	40	269	0	0	309	51	0	70	0	121	0	245	22	0	267	165	28	159	0	352	1049	0
8:15	33	234	0	1	268	47	0	86	0	133	0	209	27	0	236	147	31	171	0	349	986	1
Total	142	959	0	1	1102	164	0	321	0	485	0	822	67	0	889	564	107	705	0	1376	3852	1
8:30	42	286	0	0	328	34	0	81	0	115	0	256	22	1	279	136	41	177	0	354	1076	1
8:45	49	278	0	0	327	44	0	91	0	135	0	210	23	0	233	171	40	175	0	386	1081	0
9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	91	564	0	0	655	78	0	172	0	250	0	466	45	1	512	307	81	352	0	740	2157	1
16:00	54	194	0	1	249	43	0	96	0	139	0	390	24	0	414	73	43	52	0	168	970	1
16:15	63	191	0	0	254	45	0	99	0	144	0	324	22	0	346	71	33	62	0	166	910	0
16:30	57	208	0	0	265	36	0	76	0	112	0	466	20	0	486	77	45	56	0	178	1041	0
16:45	65	242	0	0	307	31	0	98	1	130	0	363	30	0	393	101	46	55	0	202	1032	1
Total	239	835	0	1	1075	155	0	369	1	525	0	1543	96	0	1639	322	167	225	0	714	3953	2
17:00	67	210	0	1	278	37	0	76	0	113	0	469	25	0	494	102	49	70	0	221	1106	1
17:15	75	252	0	0	327	32	0	114	0	146	0	413	23	0	436	97	51	68	0	216	1125	0
17:30	76	212	0	0	288	30	0	110	0	140	0	464	31	0	495	106	47	76	0	229	1152	0
17:45	73	266	0	1	340	63	0	135	0	198	0	380	36	0	416	147	66	81	0	294	1248	1
Total	291	940	0	2	1233	162	0	435	0	597	0	1726	115	0	1841	452	213	295	0	960	4631	2
18:00	60	221	0	0	281	40	0	116	1	157	0	413	14	1	428	176	73	95	0	344	1210	2
18:15	66	197	0	1	264	32	0	102	0	134	0	309	18	0	327	171	63	121	0	355	1080	1
18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	126	418	0	1	545	72	0	218	1	291	0	722	32	1	755	347	136	216	0	699	2290	3
Grand Total	973	4288	0	6	5267	716	0	1785	2	2503	0	5872	388	2	6262	2351	799	2283	0	5433	19465	10
Apprch %	18.5%	81.4%	0.0%	0.1%		28.6%	0.0%	71.3%	0.1%		0.0%	93.8%	6.2%	0.0%		43.3%	14.7%	42.0%	0.0%			
Total %	5.0%	22.0%	0.0%	0.0%	27.1%	3.7%	0.0%	9.2%	0.0%	12.9%	0.0%	30.2%	2.0%	0.0%	32.2%	12.1%	4.1%	11.7%	0.0%	27.9%	100.0%	

AM PEAK HOUR	Tassajara Rd Southbound					I-580 EB Off Ramp/Pimlico Dr Westbound					Tassajara Rd Northbound					I-580 EB Off Ramp/Pimlico Dr Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
8:00	40	269	0	0	309	51	0	70	0	121	0	245	22	0	267	165	28	159	0	352	1049
8:15	33	234	0	1	268	47	0	86	0	133	0	209	27	0	236	147	31	171	0	349	986
8:30	42	286	0	0	328	34	0	81	0	115	0	256	22	1	279	136	41	177	0	354	1076
8:45	49	278	0	0	327	44	0	91	0	135	0	210	23	0	233	171	40	175	0	386	1081
Total Volume	164	1067	0	1	1232	176	0	328	0	504	0	920	94	1	1015	619	140	682	0	1441	4192
% App Total	13.3%	86.6%	0.0%	0.1%		34.9%	0.0%	65.1%	0.0%		0.0%	90.6%	9.3%	0.1%		43.0%	9.7%	47.3%	0.0%		
PHF	.837	.933	.000	.250	.939	.863	.000	.901	.000	.933	.000	.898	.870	.250	.909	.905	.854	.963	.000	.933	.969

PM PEAK HOUR	Tassajara Rd Southbound					I-580 EB Off Ramp/Pimlico Dr Westbound					Tassajara Rd Northbound					I-580 EB Off Ramp/Pimlico Dr Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:15 to 18:15																					
Peak Hour For Entire Intersection Begins at 17:15																					
17:15	75	252	0	0	327	32	0	114	0	146	0	413	23	0	436	97	51	68	0	216	1125
17:30	76	212	0	0	288	30	0	110	0	140	0	464	31	0	495	106	47	76	0	229	1152
17:45	73	266	0	1	340	63	0	135	0	198	0	380	36	0	416	147	66	81	0	294	1248
18:00	60	221	0	0	281	40	0	116	1	157	0	413	14	1	428	176	73	95	0	344	1210
Total Volume	284	951	0	1	1236	165	0	475	1	641	0	1670	104	1	1775	526	237	320	0	1083	4735
% App Total	23.0%	76.9%	0.0%	0.1%		25.7%	0.0%	74.1%	0.2%		0.0%	94.1%	5.9%	0.1%		48.6%	21.9%	29.5%	0.0%		
PHF	.934	.894	.000	.250	.909	.655	.000	.880	.250	.809	.000	.900	.722	.250	.896	.747	.812	.842	.000	.787	.949

ALL TRAFFIC DATA

(916) 771-8700
orders@atdtraffic.com

City of Dublin
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

File Name : 15-7061-009 Hacienda Drive-I-580 EB Ramps.ppd
Date : 1/28/2015

Unshifted Count = All Vehicles

	Hacienda Drive Southbound					I-580 EB On-Ramp Westbound					Hacienda Drive Northbound					I-580 EB Ramps Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	0	120	28	0	148	0	0	0	0	0	0	69	24	0	93	105	0	134	0	239	480	0
07:15	0	138	17	0	155	0	0	0	0	0	0	80	33	0	113	134	0	157	0	291	559	0
07:30	0	143	27	0	170	0	0	0	0	0	0	97	28	0	125	155	0	161	0	316	611	0
07:45	0	199	35	0	234	0	0	0	0	0	0	74	30	0	104	154	0	188	0	342	680	0
Total	0	600	107	0	707	0	0	0	0	0	0	320	115	0	435	548	0	640	0	1188	2330	0
08:00	0	212	26	0	238	0	0	0	0	0	0	68	40	0	108	179	0	227	0	406	752	0
08:15	0	241	34	0	275	0	0	0	0	0	0	78	35	0	113	151	0	256	0	407	795	0
08:30	0	216	29	0	245	0	0	0	0	0	0	86	34	0	120	180	0	251	0	431	796	0
08:45	0	210	20	0	230	0	0	0	0	0	0	107	25	0	132	168	0	241	0	409	771	0
Total	0	879	109	0	988	0	0	0	0	0	0	339	134	0	473	678	0	975	0	1653	3114	0
16:00	0	106	66	0	172	0	0	0	0	0	0	237	99	0	336	140	0	86	0	226	734	0
16:15	0	130	72	0	202	0	0	0	0	0	0	206	91	0	297	166	0	105	0	271	770	0
16:30	0	131	61	0	192	0	0	0	0	0	0	262	108	0	370	158	0	82	0	240	802	0
16:45	0	128	44	0	172	0	0	0	0	0	0	272	94	0	366	161	0	74	0	235	773	0
Total	0	495	243	0	738	0	0	0	0	0	0	977	392	0	1369	625	0	347	0	972	3079	0
17:00	0	140	82	0	222	0	0	0	0	0	0	409	145	0	554	161	0	88	0	249	1025	0
17:15	0	154	77	0	231	0	0	0	0	0	0	381	133	0	514	211	0	111	0	322	1067	0
17:30	0	136	66	0	202	0	0	0	0	0	0	321	137	0	458	191	0	103	0	294	954	0
17:45	0	152	81	0	233	0	0	0	0	0	0	279	115	0	394	213	0	90	0	303	930	0
Total	0	582	306	0	888	0	0	0	0	0	0	1390	530	0	1920	776	0	392	0	1168	3976	0
Grand Total	0	2556	765	0	3321	0	0	0	0	0	0	3026	1171	0	4197	2627	0	2354	0	4981	12499	0
Apprch %	0.0%	77.0%	23.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	72.1%	27.9%	0.0%		52.7%	0.0%	47.3%	0.0%			
Total %	0.0%	20.4%	6.1%	0.0%	26.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	24.2%	9.4%	0.0%	33.6%	21.0%	0.0%	18.8%	0.0%	39.9%	100.0%	

ALL TRAFFIC DATA

(916) 771-8700
orders@atdtraffic.com

City of Dublin
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

File Name : 15-7061-009 Hacienda Drive-I-580 EB Ramps.ppd
Date : 1/28/2015

Unshifted Count = All Vehicles

AM PEAK HOUR	Hacienda Drive Southbound					I-580 EB On-Ramp Westbound					Hacienda Drive Northbound					I-580 EB Ramps Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
08:00	0	212	26	0	238	0	0	0	0	0	0	68	40	0	108	179	0	227	0	406	752
08:15	0	241	34	0	275	0	0	0	0	0	0	78	35	0	113	151	0	256	0	407	795
08:30	0	216	29	0	245	0	0	0	0	0	0	86	34	0	120	180	0	251	0	431	796
08:45	0	210	20	0	230	0	0	0	0	0	0	107	25	0	132	168	0	241	0	409	771
Total Volume	0	879	109	0	988	0	0	0	0	0	0	339	134	0	473	678	0	975	0	1653	3114
% App Total	0.0%	89.0%	11.0%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	71.7%	28.3%	0.0%		41.0%	0.0%	59.0%	0.0%		
PHF	.000	.912	.801	.000	.898	.000	.000	.000	.000	.000	.000	.792	.838	.000	.896	.942	.000	.952	.000	.959	.978

PM PEAK HOUR	Hacienda Drive Southbound					I-580 EB On-Ramp Westbound					Hacienda Drive Northbound					I-580 EB Ramps Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	0	140	82	0	222	0	0	0	0	0	0	409	145	0	554	161	0	88	0	249	1025
17:15	0	154	77	0	231	0	0	0	0	0	0	381	133	0	514	211	0	111	0	322	1067
17:30	0	136	66	0	202	0	0	0	0	0	0	321	137	0	458	191	0	103	0	294	954
17:45	0	152	81	0	233	0	0	0	0	0	0	279	115	0	394	213	0	90	0	303	930
Total Volume	0	582	306	0	888	0	0	0	0	0	0	1390	530	0	1920	776	0	392	0	1168	3976
% App Total	0.0%	65.5%	34.5%	0.0%		0.0%	0.0%	0.0%	0.0%		0.0%	72.4%	27.6%	0.0%		66.4%	0.0%	33.6%	0.0%		
PHF	.000	.945	.933	.000	.953	.000	.000	.000	.000	.000	.000	.850	.914	.000	.866	.911	.000	.883	.000	.907	.932

ALL TRAFFIC DATA

(916) 771-8700
orders@atdtraffic.com

City of Dublin
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

File Name : 15-7061-009 Hacienda Drive-I-580 EB Ramps.ppd
Date : 1/28/2015

Bank 1 Count = Peds & Bikes

	Hacienda Drive Southbound					I-580 EB On-Ramp Westbound					Hacienda Drive Northbound					I-580 EB Ramps Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Ped Total
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
07:45	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1
08:00	0	0	0	0	0	0	0	0	2	0	0	1	0	0	1	0	0	0	0	0	1	2
08:15	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	4	0	0	1	0	0	1	0	0	0	0	0	1	4
16:00	0	1	0	0	1	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	2	1
16:15	0	2	0	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	3	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	4	0	0	2	0	0	2	0	0	0	0	0	2	4
Total	0	3	0	0	3	0	0	0	5	0	0	4	0	0	4	0	0	0	0	0	7	5
17:00	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
17:15	0	0	0	0	0	0	0	0	2	0	0	1	0	0	1	0	0	0	0	0	1	2
17:30	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
17:45	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	0	0	0	8	0	0	1	0	0	1	0	0	0	0	0	1	8
Grand Total	0	4	0	0	4	0	0	0	18	0	0	6	0	0	6	0	0	0	0	0	10	18
Apprch %	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%				
Total %	0.0%	40.0%	0.0%		40.0%	0.0%	0.0%	0.0%		0.0%	0.0%	60.0%	0.0%		60.0%	0.0%	0.0%	0.0%		0.0%	100.0%	

ALL TRAFFIC DATA

City of Dublin
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 15-7061-009 Hacienda Drive-I-580 EB Ramps.ppd
Date : 1/28/2015

Bank 1 Count = Peds & Bikes

AM PEAK HOUR	Hacienda Drive Southbound					I-580 EB On-Ramp Westbound					Hacienda Drive Northbound					I-580 EB Ramps Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
08:00	0	0	0	0	0	0	0	0	2	0	0	1	0	0	1	0	0	0	0	0	1
08:15	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	4	0	0	1	0	0	1	0	0	0	0	0	1
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.250	.000		.250	.000	.000	.000		.000	.250

PM PEAK HOUR	Hacienda Drive Southbound					I-580 EB On-Ramp Westbound					Hacienda Drive Northbound					I-580 EB Ramps Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	2	0	0	1	0	0	1	0	0	0	0	0	1
17:30	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	8	0	0	1	0	0	1	0	0	0	0	0	1
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.250	.000		.250	.000	.000	.000		.000	.250

ALL TRAFFIC DATA

(916) 771-8700
orders@atdtraffic.com

City of Dublin
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

File Name : 15-7061-008 Hacienda Drive-I-580 WB Ramps.ppd
Date : 1/28/2015

Unshifted Count = All Vehicles

	Hacienda Drive Southbound					I-580 WB Ramps Westbound					Hacienda Drive Northbound					I-580 WB On-Ramp Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	0	61	63	0	124	90	0	110	0	200	0	139	35	0	174	0	0	0	0	0	498	0
07:15	0	54	76	0	130	93	0	91	0	184	0	162	42	0	204	0	0	0	0	0	518	0
07:30	0	98	89	0	187	79	0	75	0	154	0	206	51	0	257	0	0	0	0	0	598	0
07:45	0	126	85	0	211	102	0	59	0	161	0	185	42	0	227	0	0	0	0	0	599	0
Total	0	339	313	0	652	364	0	335	0	699	0	692	170	0	862	0	0	0	0	0	2213	0
08:00	0	126	89	0	215	113	0	60	0	173	0	204	36	0	240	0	0	0	0	0	628	0
08:15	0	147	110	0	257	116	0	51	0	167	0	194	33	0	227	0	0	0	0	0	651	0
08:30	0	144	92	0	236	108	0	44	0	152	0	225	47	0	272	0	0	0	0	0	660	0
08:45	0	109	88	0	197	116	0	46	0	162	0	228	44	0	272	0	0	0	0	0	631	0
Total	0	526	379	0	905	453	0	201	0	654	0	851	160	0	1011	0	0	0	0	0	2570	0
16:00	0	139	146	0	285	42	0	49	0	91	0	239	149	0	388	0	0	0	0	0	764	0
16:15	0	131	141	0	272	59	0	52	0	111	0	242	127	0	369	0	0	0	0	0	752	0
16:30	0	151	141	0	292	43	0	42	0	85	0	264	161	0	425	0	0	0	0	0	802	0
16:45	0	126	155	0	281	59	0	55	0	114	0	301	140	0	441	0	0	0	0	0	836	0
Total	0	547	583	0	1130	203	0	198	0	401	0	1046	577	0	1623	0	0	0	0	0	3154	0
17:00	0	164	163	0	327	39	0	72	0	111	0	321	233	0	554	0	0	0	0	0	992	0
17:15	0	190	143	0	333	37	0	65	0	102	0	395	199	0	594	0	0	0	0	0	1029	0
17:30	0	152	192	0	344	58	0	45	0	103	0	363	151	0	514	0	0	0	0	0	961	0
17:45	0	180	126	0	306	46	0	41	0	87	0	367	121	0	488	0	0	0	0	0	881	0
Total	0	686	624	0	1310	180	0	223	0	403	0	1446	704	0	2150	0	0	0	0	0	3863	0
Grand Total	0	2098	1899	0	3997	1200	0	957	0	2157	0	4035	1611	0	5646	0	0	0	0	0	11800	0
Apprch %	0.0%	52.5%	47.5%	0.0%		55.6%	0.0%	44.4%	0.0%		0.0%	71.5%	28.5%	0.0%		0.0%	0.0%	0.0%	0.0%			
Total %	0.0%	17.8%	16.1%	0.0%	33.9%	10.2%	0.0%	8.1%	0.0%	18.3%	0.0%	34.2%	13.7%	0.0%	47.8%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	

ALL TRAFFIC DATA

(916) 771-8700
orders@atdtraffic.com

City of Dublin
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

File Name : 15-7061-008 Hacienda Drive-I-580 WB Ramps.ppd
Date : 1/28/2015

Unshifted Count = All Vehicles

AM PEAK HOUR	Hacienda Drive Southbound					I-580 WB Ramps Westbound					Hacienda Drive Northbound					I-580 WB On-Ramp Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
08:00	0	126	89	0	215	113	0	60	0	173	0	204	36	0	240	0	0	0	0	0	628
08:15	0	147	110	0	257	116	0	51	0	167	0	194	33	0	227	0	0	0	0	0	651
08:30	0	144	92	0	236	108	0	44	0	152	0	225	47	0	272	0	0	0	0	0	660
08:45	0	109	88	0	197	116	0	46	0	162	0	228	44	0	272	0	0	0	0	0	631
Total Volume	0	526	379	0	905	453	0	201	0	654	0	851	160	0	1011	0	0	0	0	0	2570
% App Total	0.0%	58.1%	41.9%	0.0%		69.3%	0.0%	30.7%	0.0%		0.0%	84.2%	15.8%	0.0%		0.0%	0.0%	0.0%	0.0%		
PHF	.000	.895	.861	.000	.880	.976	.000	.838	.000	.945	.000	.933	.851	.000	.929	.000	.000	.000	.000	.000	.973

PM PEAK HOUR	Hacienda Drive Southbound					I-580 WB Ramps Westbound					Hacienda Drive Northbound					I-580 WB On-Ramp Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	0	164	163	0	327	39	0	72	0	111	0	321	233	0	554	0	0	0	0	0	992
17:15	0	190	143	0	333	37	0	65	0	102	0	395	199	0	594	0	0	0	0	0	1029
17:30	0	152	192	0	344	58	0	45	0	103	0	363	151	0	514	0	0	0	0	0	961
17:45	0	180	126	0	306	46	0	41	0	87	0	367	121	0	488	0	0	0	0	0	881
Total Volume	0	686	624	0	1310	180	0	223	0	403	0	1446	704	0	2150	0	0	0	0	0	3863
% App Total	0.0%	52.4%	47.6%	0.0%		44.7%	0.0%	55.3%	0.0%		0.0%	67.3%	32.7%	0.0%		0.0%	0.0%	0.0%	0.0%		
PHF	.000	.903	.813	.000	.952	.776	.000	.774	.000	.908	.000	.915	.755	.000	.905	.000	.000	.000	.000	.000	.939

ALL TRAFFIC DATA

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City of Dublin
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

File Name : 15-7061-008 Hacienda Drive-I-580 WB Ramps.ppd
Date : 1/28/2015

Bank 1 Count = Peds & Bikes

	Hacienda Drive Southbound					I-580 WB Ramps Westbound					Hacienda Drive Northbound					I-580 WB On-Ramp Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Ped Total
07:00	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
07:15	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
07:30	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
07:45	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	1	0	0	1	0	0	0	3	0	0	1	0	0	1	0	0	0	0	0	2	3
08:00	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	1	1
08:15	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Total	0	1	0	0	1	0	0	0	3	0	0	1	0	0	1	0	0	0	0	0	2	3
16:00	0	1	0	0	1	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	2	1
16:15	0	2	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	1
16:30	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	2	0
16:45	0	0	0	0	0	0	0	0	5	0	0	1	0	0	1	0	0	0	0	0	1	5
Total	0	3	0	0	3	0	0	0	7	0	0	4	0	0	4	0	0	0	0	0	7	7
17:00	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
17:15	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
17:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	0
17:45	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	0	0	0	0	0	9	0	0	1	0	0	1	0	0	0	0	0	1	9
Grand Total	0	5	0	0	5	0	0	0	22	0	0	7	0	0	7	0	0	0	0	0	12	22
Apprch %	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%				
Total %	0.0%	41.7%	0.0%		41.7%	0.0%	0.0%	0.0%		0.0%	0.0%	58.3%	0.0%		58.3%	0.0%	0.0%	0.0%		0.0%	100.0%	

ALL TRAFFIC DATA

City of Dublin
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 15-7061-008 Hacienda Drive-I-580 WB Ramps.ppd
Date : 1/28/2015

Bank 1 Count = Peds & Bikes

AM PEAK HOUR	Hacienda Drive Southbound					I-580 WB Ramps Westbound					Hacienda Drive Northbound					I-580 WB On-Ramp Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 08:00 to 09:00																					
Peak Hour For Entire Intersection Begins at 08:00																					
08:00	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	1
08:15	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	1	0	0	1	0	0	0	3	0	0	1	0	0	1	0	0	0	0	0	2
% App Total	0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.250	.000		.250	.000	.000	.000		.000	.000	.250	.000		.250	.000	.000	.000		.000	.500

PM PEAK HOUR	Hacienda Drive Southbound					I-580 WB Ramps Westbound					Hacienda Drive Northbound					I-580 WB On-Ramp Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1
17:45	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	9	0	0	1	0	0	1	0	0	0	0	0	1
% App Total	0.0%	0.0%	0.0%			0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	0.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.000	.000		.000	.000	.250	.000		.250	.000	.000	.000		.000	.250

ALL TRAFFIC DATA

City of Dublin
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 15-7061-007 Hacienda Drive-Dublin Boulevard.ppd
Date : 1/28/2015

Unshifted Count = All Vehicles

	Hacienda Drive Southbound					Dublin Boulevard Westbound					Hacienda Drive Northbound					Dublin Boulevard Eastbound						
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total	Uturn Total
07:00	2	52	9	0	63	42	163	9	0	214	28	90	14	0	132	6	27	13	1	47	456	1
07:15	3	55	39	1	98	45	174	8	1	228	25	109	19	0	153	5	54	10	2	71	550	4
07:30	1	78	65	0	144	63	239	19	1	322	35	138	14	2	189	9	53	23	1	86	741	4
07:45	5	83	26	1	115	61	179	19	0	259	30	137	30	0	197	17	85	17	0	119	690	1
Total	11	268	139	2	420	211	755	55	2	1023	118	474	77	2	671	37	219	63	4	323	2437	10
08:00	2	91	17	0	110	77	178	15	0	270	29	144	36	0	209	22	102	19	2	145	734	2
08:15	5	135	24	0	164	62	132	21	0	215	51	133	35	0	219	9	62	18	0	89	687	0
08:30	2	116	18	0	136	71	145	13	0	229	52	122	41	0	215	14	66	25	1	106	686	1
08:45	3	81	19	0	103	59	151	15	0	225	35	132	42	0	209	10	74	16	1	101	638	1
Total	12	423	78	0	513	269	606	64	0	939	167	531	154	0	852	55	304	78	4	441	2745	4
16:00	18	120	9	0	147	34	113	6	1	154	43	64	83	0	190	9	208	45	2	264	755	3
16:15	8	89	12	0	109	51	95	3	3	152	40	81	114	0	235	22	234	42	1	299	795	4
16:30	25	112	12	0	149	42	103	8	3	156	39	101	97	0	237	24	256	43	4	327	869	7
16:45	20	121	16	0	157	38	108	7	0	153	33	109	83	0	225	25	226	36	2	289	824	2
Total	71	442	49	0	562	165	419	24	7	615	155	355	377	0	887	80	924	166	9	1179	3243	16
17:00	22	161	19	0	202	51	110	3	0	164	51	116	101	0	268	33	230	42	0	305	939	0
17:15	21	125	26	0	172	46	147	9	3	205	45	133	124	0	302	17	253	54	0	324	1003	3
17:30	19	154	25	2	200	40	113	2	0	155	49	143	96	0	288	28	212	33	2	275	918	4
17:45	19	125	18	0	162	41	137	6	0	184	40	126	97	1	264	13	230	37	1	281	891	2
Total	81	565	88	2	736	178	507	20	3	708	185	518	418	1	1122	91	925	166	3	1185	3751	9
Grand Total	175	1698	354	4	2231	823	2287	163	12	3285	625	1878	1026	3	3532	263	2372	473	20	3128	12176	39
Apprch %	7.8%	76.1%	15.9%	0.2%		25.1%	69.6%	5.0%	0.4%		17.7%	53.2%	29.0%	0.1%		8.4%	75.8%	15.1%	0.6%			
Total %	1.4%	13.9%	2.9%	0.0%	18.3%	6.8%	18.8%	1.3%	0.1%	27.0%	5.1%	15.4%	8.4%	0.0%	29.0%	2.2%	19.5%	3.9%	0.2%	25.7%	100.0%	

ALL TRAFFIC DATA

City of Dublin
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 15-7061-007 Hacienda Drive-Dublin Boulevard.ppd
Date : 1/28/2015

Unshifted Count = All Vehicles

AM PEAK HOUR	Hacienda Drive Southbound					Dublin Boulevard Westbound					Hacienda Drive Northbound					Dublin Boulevard Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 07:30 to 08:30																					
Peak Hour For Entire Intersection Begins at 07:30																					
07:30	1	78	65	0	144	63	239	19	1	322	35	138	14	2	189	9	53	23	1	86	741
07:45	5	83	26	1	115	61	179	19	0	259	30	137	30	0	197	17	85	17	0	119	690
08:00	2	91	17	0	110	77	178	15	0	270	29	144	36	0	209	22	102	19	2	145	734
08:15	5	135	24	0	164	62	132	21	0	215	51	133	35	0	219	9	62	18	0	89	687
Total Volume	13	387	132	1	533	263	728	74	1	1066	145	552	115	2	814	57	302	77	3	439	2852
% App Total	2.4%	72.6%	24.8%	0.2%		24.7%	68.3%	6.9%	0.1%		17.8%	67.8%	14.1%	0.2%		13.0%	68.8%	17.5%	0.7%		
PHF	.650	.717	.508	.250	.813	.854	.762	.881	.250	.828	.711	.958	.799	.250	.929	.648	.740	.837	.375	.757	.962

PM PEAK HOUR	Hacienda Drive Southbound					Dublin Boulevard Westbound					Hacienda Drive Northbound					Dublin Boulevard Eastbound					
START TIME	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	LEFT	THRU	RIGHT	UTURNS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	22	161	19	0	202	51	110	3	0	164	51	116	101	0	268	33	230	42	0	305	939
17:15	21	125	26	0	172	46	147	9	3	205	45	133	124	0	302	17	253	54	0	324	1003
17:30	19	154	25	2	200	40	113	2	0	155	49	143	96	0	288	28	212	33	2	275	918
17:45	19	125	18	0	162	41	137	6	0	184	40	126	97	1	264	13	230	37	1	281	891
Total Volume	81	565	88	2	736	178	507	20	3	708	185	518	418	1	1122	91	925	166	3	1185	3751
% App Total	11.0%	76.8%	12.0%	0.3%		25.1%	71.6%	2.8%	0.4%		16.5%	46.2%	37.3%	0.1%		7.7%	78.1%	14.0%	0.3%		
PHF	.920	.877	.846	.250	.911	.873	.862	.556	.250	.863	.907	.906	.843	.250	.929	.689	.914	.769	.375	.914	.935

ALL TRAFFIC DATA

City of Dublin
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 15-7061-007 Hacienda Drive-Dublin Boulevard.ppd
Date : 1/28/2015

Bank 1 Count = Peds & Bikes

	Hacienda Drive Southbound					Dublin Boulevard Westbound					Hacienda Drive Northbound					Dublin Boulevard Eastbound						
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total	Ped Total
07:00	0	0	1	2	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	4
07:15	1	0	0	2	1	0	1	0	1	1	0	0	0	0	0	0	1	1	0	2	4	3
07:30	0	0	0	3	0	0	0	0	1	0	0	0	0	1	0	0	0	0	4	0	0	9
07:45	0	0	0	3	0	0	0	0	2	0	0	0	0	2	0	0	0	0	2	0	0	9
Total	1	0	1	10	2	0	1	0	6	1	0	0	0	3	0	0	1	1	6	2	5	25
08:00	0	0	0	3	0	0	0	1	3	1	0	0	0	0	0	0	1	0	0	1	2	6
08:15	0	3	0	0	3	1	1	0	1	2	1	0	0	1	1	0	0	0	1	0	6	3
08:30	0	0	0	2	0	1	0	0	1	1	0	0	0	0	0	0	1	0	0	1	2	3
08:45	0	0	0	0	0	0	1	0	1	1	0	0	0	1	0	0	0	0	1	0	1	3
Total	0	3	0	5	3	2	2	1	6	5	1	0	0	2	1	0	2	0	2	2	11	15
16:00	0	0	0	2	0	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	0	5
16:15	0	0	0	2	0	0	0	0	4	0	0	0	0	0	0	0	1	0	1	1	1	7
16:30	0	0	0	0	0	0	1	0	1	1	0	1	0	1	1	0	0	0	1	0	2	3
16:45	0	0	0	4	0	0	0	0	1	0	0	1	0	2	1	0	1	0	2	1	2	9
Total	0	0	0	8	0	0	1	0	8	1	0	2	0	4	2	0	2	0	4	2	5	24
17:00	0	0	0	2	0	0	0	0	5	0	0	0	0	2	0	0	0	0	2	0	0	11
17:15	0	0	0	6	0	0	0	0	4	0	0	0	0	0	0	0	1	0	0	1	1	10
17:30	0	0	0	1	0	0	0	0	3	0	0	1	0	1	1	0	0	0	0	0	1	5
17:45	0	0	0	0	0	0	1	0	1	1	0	0	0	2	0	0	0	0	2	0	1	5
Total	0	0	0	9	0	0	1	0	13	1	0	1	0	5	1	0	1	0	4	1	3	31
Grand Total	1	3	1	32	5	2	5	1	33	8	1	3	0	14	4	0	6	1	16	7	24	95
Apprch %	20.0%	60.0%	20.0%			25.0%	62.5%	12.5%			25.0%	75.0%	0.0%			0.0%	85.7%	14.3%				
Total %	4.2%	12.5%	4.2%		20.8%	8.3%	20.8%	4.2%		33.3%	4.2%	12.5%	0.0%		16.7%	0.0%	25.0%	4.2%		29.2%	100.0%	

ALL TRAFFIC DATA

(916) 771-8700
orders@atdtraffic.com

City of Dublin
All Vehicles on Unshifted
Peds & Bikes on Bank 1
Heavy Trucks on Bank 2

File Name : 15-7061-007 Hacienda Drive-Dublin Boulevard.ppd
Date : 1/28/2015

Bank 1 Count = Peds & Bikes

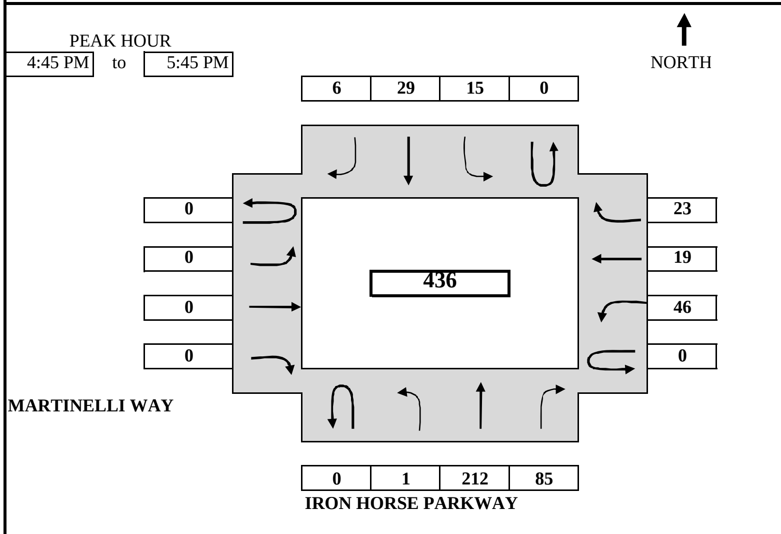
AM PEAK HOUR	Hacienda Drive Southbound					Dublin Boulevard Westbound					Hacienda Drive Northbound					Dublin Boulevard Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 07:30 to 08:30																					
Peak Hour For Entire Intersection Begins at 07:30																					
07:30	0	0	0	3	0	0	0	0	1	0	0	0	0	1	0	0	0	0	4	0	0
07:45	0	0	0	3	0	0	0	0	2	0	0	0	0	2	0	0	0	0	2	0	0
08:00	0	0	0	3	0	0	0	1	3	1	0	0	0	0	0	0	1	0	0	1	2
08:15	0	3	0	0	3	1	1	0	1	2	1	0	0	1	1	0	0	0	1	0	6
Total Volume	0	3	0	9	3	1	1	1	7	3	1	0	0	4	1	0	1	0	7	1	8
% App Total	0.0%	100.0%	0.0%			33.3%	33.3%	33.3%			100.0%	0.0%	0.0%			0.0%	100.0%	0.0%			
PHF	.000	.250	.000		.250	.250	.250	.250		.375	.250	.000	.000		.250	.000	.250	.000		.250	.333

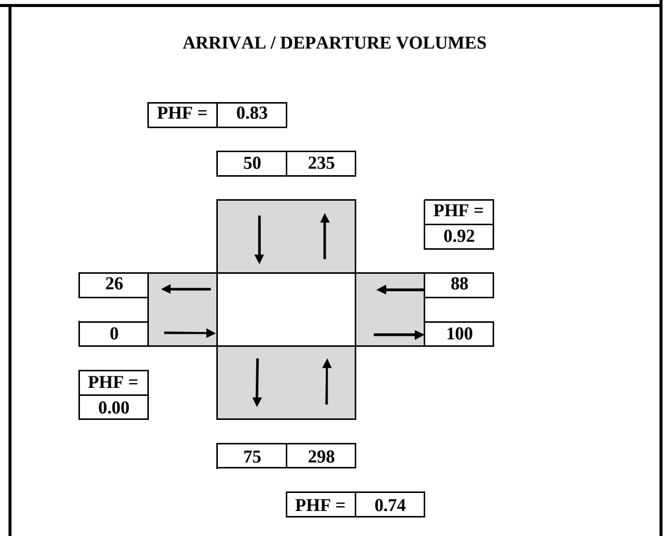
PM PEAK HOUR	Hacienda Drive Southbound					Dublin Boulevard Westbound					Hacienda Drive Northbound					Dublin Boulevard Eastbound					
START TIME	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	LEFT	THRU	RIGHT	PEDS	APP.TOTAL	Total
Peak Hour Analysis From 17:00 to 18:00																					
Peak Hour For Entire Intersection Begins at 17:00																					
17:00	0	0	0	2	0	0	0	0	5	0	0	0	0	2	0	0	0	0	2	0	0
17:15	0	0	0	6	0	0	0	0	4	0	0	0	0	0	0	0	1	0	0	1	1
17:30	0	0	0	1	0	0	0	0	3	0	0	1	0	1	1	0	0	0	0	0	1
17:45	0	0	0	0	0	0	1	0	1	1	0	0	0	2	0	0	0	0	2	0	1
Total Volume	0	0	0	9	0	0	1	0	13	1	0	1	0	5	1	0	1	0	4	1	3
% App Total	0.0%	0.0%	0.0%			0.0%	100.0%	0.0%			0.0%	100.0%	0.0%			0.0%	100.0%	0.0%			
PHF	.000	.000	.000		.000	.000	.250	.000		.250	.000	.250	.000		.250	.000	.250	.000		.250	.750

B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	**DUBLIN TRAFFIC COUNTS**	**SURVEY DATE:**	**1/30/2013**	**DAY:**	**WEDNESDAY**
N-S APPROACH:	**IRON HORSE PARKWAY**	**SURVEY TIME:**	**4:00 PM**	**TO**	**6:00 PM**
E-W APPROACH:	**MARTINELLI WAY**	**JURISDICTION:**	**DUBLIN**	**FILE:**	**3301008-2PM**





TIME From	PERIOD To	NB U-TURN	NB LEFT	NB THRU	NB RIGHT	SB U-TURN	SB LEFT	SB THRU	SB RIGHT	EB U-TURN	EB LEFT	EB THRU	EB RIGHT	WB U-TURN	WB LEFT	WB THRU	WB RIGHT	TOTAL
SURVEY DATA																		
4:00 PM	to 4:15 PM		0	30	18		3	3	1		0	0	0		7	5	3	**70**
4:15 PM	to 4:30 PM		0	48	32		7	9	1		0	0	0		10	5	8	**120**
4:30 PM	to 4:45 PM		1	69	52		10	16	4		0	0	0		15	10	11	**188**
4:45 PM	to 5:00 PM		1	118	87		12	23	4		0	0	0		28	16	15	**304**
5:00 PM	to 5:15 PM		1	163	100		15	32	7		0	0	0		37	19	22	**396**
5:15 PM	to 5:30 PM		1	206	112		18	38	9		0	0	0		49	24	27	**484**
5:30 PM	to 5:45 PM		2	281	137		25	45	10		0	0	0		61	29	34	**624**
5:45 PM	to 6:00 PM		4	327	151		25	49	13		0	0	0		75	37	42	**723**
TOTAL BY PERIOD																		
4:00 PM	to 4:15 PM	0	0	30	18	0	3	3	1	0	0	0	0	0	7	5	3	**70**
4:15 PM	to 4:30 PM	0	0	18	14	0	4	6	0	0	0	0	0	0	3	0	5	**50**
4:30 PM	to 4:45 PM	0	1	21	20	0	3	7	3	0	0	0	0	0	5	5	3	**68**
4:45 PM	to 5:00 PM	0	0	49	35	0	2	7	0	0	0	0	0	0	13	6	4	**116**
5:00 PM	to 5:15 PM	0	0	45	13	0	3	9	3	0	0	0	0	0	9	3	7	**92**
5:15 PM	to 5:30 PM	0	0	43	12	0	3	6	2	0	0	0	0	0	12	5	5	**88**
5:30 PM	to 5:45 PM	0	1	75	25	0	7	7	1	0	0	0	0	0	12	5	7	**140**
5:45 PM	to 6:00 PM	0	2	46	14	0	0	4	3	0	0	0	0	0	14	8	8	**99**
HOURLY TOTALS																		
4:00 PM	to 5:00 PM	0	1	118	87	0	12	23	4	0	0	0	0	0	28	16	15	**304**
4:15 PM	to 5:15 PM	0	1	133	82	0	12	29	6	0	0	0	0	0	30	14	19	**326**
4:30 PM	to 5:30 PM	0	1	158	80	0	11	29	8	0	0	0	0	0	39	19	19	**364**
4:45 PM	to 5:45 PM	0	1	212	85	0	15	29	6	0	0	0	0	0	46	19	23	**436**
5:00 PM	to 6:00 PM	0	3	209	64	0	13	26	9	0	0	0	0	0	47	21	27	**419**

PEAK HOUR SUMMARY

4:45 PM to 5:45 PM	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	TOTAL
VOLUME	0	1	212	85	0	15	29	6	0	0	0	0	0	46	19	23	**436**
PEDESTRIAN																	**35**
BICYCLE																	**6**
PHF BY MOVEMENT	0.00	0.25	0.71	0.61	0.00	0.54	0.81	0.50	0.00	0.00	0.00	0.00	0.00	0.88	0.79	0.82	OVERALL
PHF BY APPROACH	0.74				0.83				0.00				0.92				0.78

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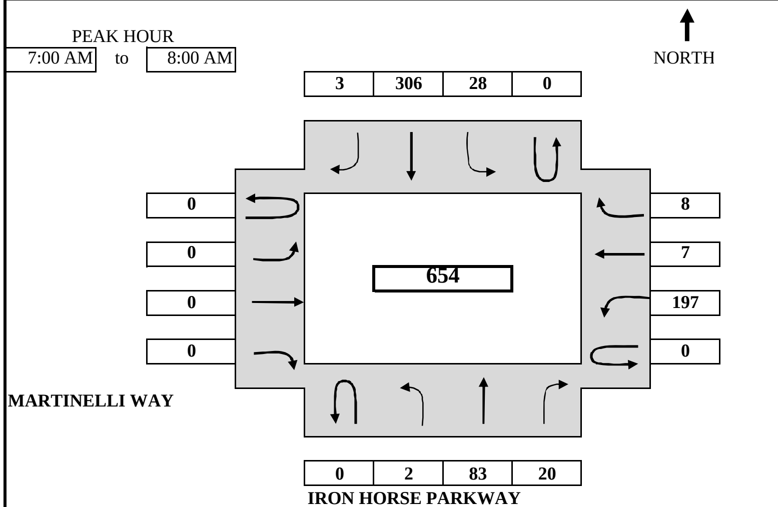
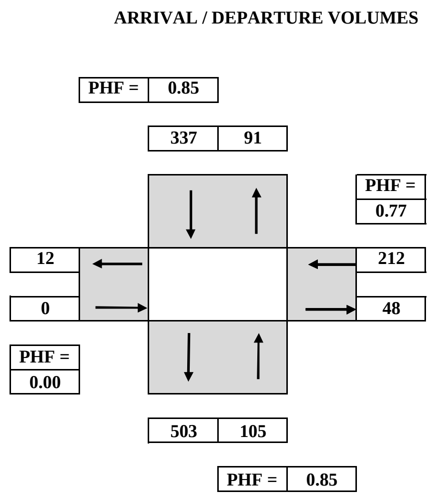
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	DUBLIN TRAFFIC COUNTS	SURVEY DATE:	1/30/2013	DAY:	WEDNESDAY
N-S APPROACH:	IRON HORSE PARKWAY	SURVEY TIME:	7:00 AM	TO	9:00 AM
E-W APPROACH:	MARTINELLI WAY	JURISDICTION:	DUBLIN	FILE:	3301008-2AM





TIME From		PERIOD To	NB U-TURN	NB LEFT	NB THRU	NB RIGHT	SB U-TURN	SB LEFT	SB THRU	SB RIGHT	EB U-TURN	EB LEFT	EB THRU	EB RIGHT	WB U-TURN	WB LEFT	WB THRU	WB RIGHT	TOTAL
SURVEY DATA																			
7:00 AM	to	7:15 AM		0	19	4		6	82	0		0	0	0		45	3	3	162
7:15 AM	to	7:30 AM		1	38	11		11	175	1		0	0	0		112	3	5	357
7:30 AM	to	7:45 AM		2	58	14		20	260	3		0	0	0		174	5	7	543
7:45 AM	to	8:00 AM		2	83	20		28	306	3		0	0	0		197	7	8	654
8:00 AM	to	8:15 AM		2	107	31		37	344	4		0	0	0		222	7	9	763
8:15 AM	to	8:30 AM		3	126	40		45	376	7		0	0	0		248	9	10	864
8:30 AM	to	8:45 AM		4	148	46		51	398	7		0	0	0		270	14	11	949
8:45 AM	to	9:00 AM		6	163	51		62	411	8		0	0	0		291	17	17	1026
TOTAL BY PERIOD																			
7:00 AM	to	7:15 AM	0	0	19	4	0	6	82	0	0	0	0	0	0	45	3	3	162
7:15 AM	to	7:30 AM	0	1	19	7	0	5	93	1	0	0	0	0	0	67	0	2	195
7:30 AM	to	7:45 AM	0	1	20	3	0	9	85	2	0	0	0	0	0	62	2	2	186
7:45 AM	to	8:00 AM	0	0	25	6	0	8	46	0	0	0	0	0	0	23	2	1	111
8:00 AM	to	8:15 AM	0	0	24	11	0	9	38	1	0	0	0	0	0	25	0	1	109
8:15 AM	to	8:30 AM	0	1	19	9	0	8	32	3	0	0	0	0	0	26	2	1	101
8:30 AM	to	8:45 AM	0	1	22	6	0	6	22	0	0	0	0	0	0	22	5	1	85
8:45 AM	to	9:00 AM	0	2	15	5	0	11	13	1	0	0	0	0	0	21	3	6	77
HOURLY TOTALS																			
7:00 AM	to	8:00 AM	0	2	83	20	0	28	306	3	0	0	0	0	0	197	7	8	654
7:15 AM	to	8:15 AM	0	2	88	27	0	31	262	4	0	0	0	0	0	177	4	6	601
7:30 AM	to	8:30 AM	0	2	88	29	0	34	201	6	0	0	0	0	0	136	6	5	507
7:45 AM	to	8:45 AM	0	2	90	32	0	31	138	4	0	0	0	0	0	96	9	4	406
8:00 AM	to	9:00 AM	0	4	80	31	0	34	105	5	0	0	0	0	0	94	10	9	372

PEAK HOUR SUMMARY

7:00 AM to 8:00 AM	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	TOTAL
VOLUME	0	2	83	20	0	28	306	3	0	0	0	0	0	197	7	8	654
PEDESTRIAN																	32
BICYCLE																	5
PHF BY MOVEMENT	0.00	0.50	0.83	0.71	0.00	0.78	0.82	0.38	0.00	0.00	0.00	0.00	0.00	0.74	0.58	0.67	OVERALL
PHF BY APPROACH	0.85				0.85				0.00				0.77				0.84

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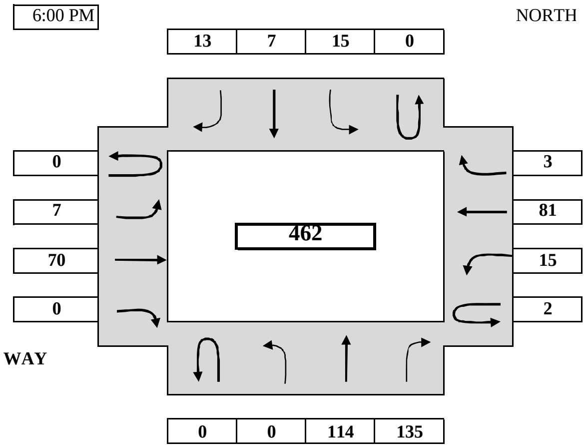
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	**DUBLIN TRAFFIC COUNTS**	**SURVEY DATE:**	**1/30/2013**	**DAY:**	**WEDNESDAY**
N-S APPROACH:	**ARNOLD ROAD**	**SURVEY TIME:**	**4:00 PM**	**TO**	**6:00 PM**
E-W APPROACH:	**MARTINELLI WAY**	**JURISDICTION:**	**DUBLIN**	**FILE:**	**3301008-1PM**

PEAK HOUR
5:00 PM to 6:00 PM

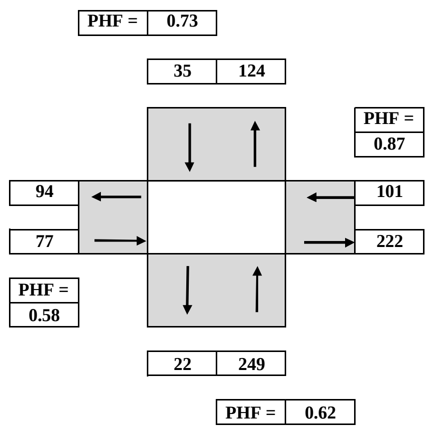
NORTH



MARTINELLI WAY

ARNOLD ROAD

ARRIVAL / DEPARTURE VOLUMES



TIME From		PERIOD To	NB U-TURN	NB LEFT	NB THRU	NB RIGHT	SB U-TURN	SB LEFT	SB THRU	SB RIGHT	EB U-TURN	EB LEFT	EB THRU	EB RIGHT	WB U-TURN	WB LEFT	WB THRU	WB RIGHT	TOTAL
SURVEY DATA																			
4:00 PM	to	4:15 PM		0	10	11		1	0	1		1	21	0	0	2	15	1	**63**
4:15 PM	to	4:30 PM		0	14	28		2	3	2		1	38	0	0	2	21	2	**113**
4:30 PM	to	4:45 PM		0	22	40		8	4	4		3	58	0	0	2	30	5	**176**
4:45 PM	to	5:00 PM		0	41	61		12	5	6		4	96	0	0	4	52	7	**288**
5:00 PM	to	5:15 PM		0	62	96		16	7	8		6	111	0	0	8	69	7	**390**
5:15 PM	to	5:30 PM		0	78	110		18	8	9		7	124	0	2	9	90	8	**463**
5:30 PM	to	5:45 PM		0	125	163		22	10	15		10	154	0	2	16	108	9	**634**
5:45 PM	to	6:00 PM		0	155	196		27	12	19		11	166	0	2	19	133	10	**750**
TOTAL BY PERIOD																			
4:00 PM	to	4:15 PM	0	0	10	11	0	1	0	1	0	1	21	0	0	2	15	1	**63**
4:15 PM	to	4:30 PM	0	0	4	17	0	1	3	1	0	0	17	0	0	0	6	1	**50**
4:30 PM	to	4:45 PM	0	0	8	12	0	6	1	2	0	2	20	0	0	0	9	3	**63**
4:45 PM	to	5:00 PM	0	0	19	21	0	4	1	2	0	1	38	0	0	2	22	2	**112**
5:00 PM	to	5:15 PM	0	0	21	35	0	4	2	2	0	2	15	0	0	4	17	0	**102**
5:15 PM	to	5:30 PM	0	0	16	14	0	2	1	1	0	1	13	0	2	1	21	1	**73**
5:30 PM	to	5:45 PM	0	0	47	53	0	4	2	6	0	3	30	0	0	7	18	1	**171**
5:45 PM	to	6:00 PM	0	0	30	33	0	5	2	4	0	1	12	0	0	3	25	1	**116**
HOURLY TOTALS																			
4:00 PM	to	5:00 PM	0	0	41	61	0	12	5	6	0	4	96	0	0	4	52	7	**288**
4:15 PM	to	5:15 PM	0	0	52	85	0	15	7	7	0	5	90	0	0	6	54	6	**327**
4:30 PM	to	5:30 PM	0	0	64	82	0	16	5	7	0	6	86	0	2	7	69	6	**350**
4:45 PM	to	5:45 PM	0	0	103	123	0	14	6	11	0	7	96	0	2	14	78	4	**458**
5:00 PM	to	6:00 PM	0	0	114	135	0	15	7	13	0	7	70	0	2	15	81	3	**462**

PEAK HOUR SUMMARY

5:00 PM to 6:00 PM	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	TOTAL
VOLUME	0	0	114	135	0	15	7	13	0	7	70	0	2	15	81	3	**462**
PEDESTRIAN																	**9**
BICYCLE																	**2**
PHF BY MOVEMENT	0.00	0.00	0.61	0.64	0.00	0.75	0.88	0.54	0.00	0.58	0.58	0.00	0.25	0.54	0.81	0.75	OVERALL
PHF BY APPROACH	0.62				0.73				0.58				0.87				0.68

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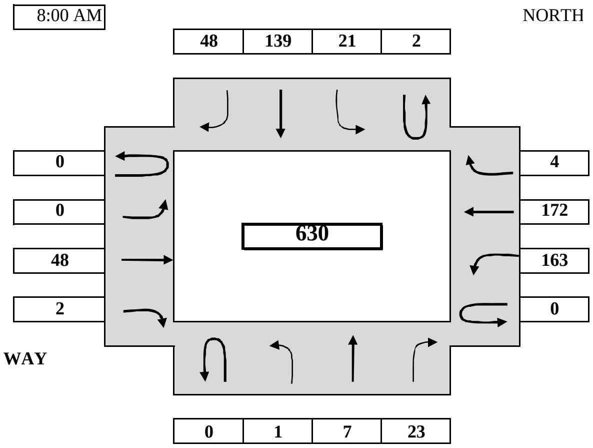
B.A.Y.M.E.T.R.I.C.S.

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT:	**DUBLIN TRAFFIC COUNTS**	**SURVEY DATE:**	**1/30/2013**	**DAY:**	**WEDNESDAY**
N-S APPROACH:	**ARNOLD ROAD**	**SURVEY TIME:**	**7:00 AM**	**TO**	**9:00 AM**
E-W APPROACH:	**MARTINELLI WAY**	**JURISDICTION:**	**DUBLIN**	**FILE:**	**3301008-1AM**

PEAK HOUR
7:00 AM to 8:00 AM

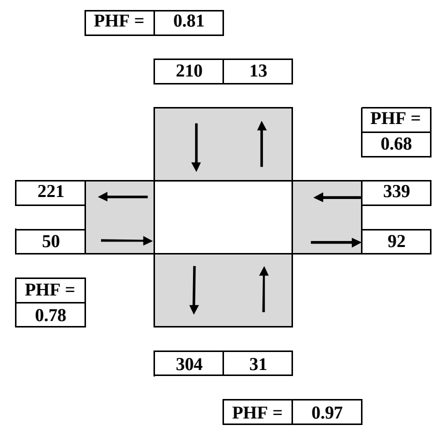
NORTH



MARTINELLI WAY

ARNOLD ROAD

ARRIVAL / DEPARTURE VOLUMES



TIME From	PERIOD	To	NB U-TURN	NB LEFT	NB THRU	NB RIGHT	SB U-TURN	SB LEFT	SB THRU	SB RIGHT	EB U-TURN	EB LEFT	EB THRU	EB RIGHT	WB U-TURN	WB LEFT	WB THRU	WB RIGHT	TOTAL
SURVEY DATA																			
7:00 AM	to	7:15 AM		1	2	5	1	7	42	11		0	11	0		43	42	1	**166**
7:15 AM	to	7:30 AM		1	6	9	1	11	78	23		0	22	0		102	106	2	**361**
7:30 AM	to	7:45 AM		1	6	16	2	19	119	38		0	37	1		146	156	3	**544**
7:45 AM	to	8:00 AM		1	7	23	2	21	139	48		0	48	2		163	172	4	**630**
8:00 AM	to	8:15 AM		2	12	31	2	23	166	57		2	68	2		182	190	5	**742**
8:15 AM	to	8:30 AM		3	15	35	2	26	185	64		3	85	2		192	212	5	**829**
8:30 AM	to	8:45 AM		4	23	45	2	28	202	72		3	96	2		199	231	5	**912**
8:45 AM	to	9:00 AM		4	26	48	2	30	207	76		3	112	2		208	252	5	**975**
TOTAL BY PERIOD																			
7:00 AM	to	7:15 AM	0	1	2	5	1	7	42	11	0	0	11	0	0	43	42	1	**166**
7:15 AM	to	7:30 AM	0	0	4	4	0	4	36	12	0	0	11	0	0	59	64	1	**195**
7:30 AM	to	7:45 AM	0	0	0	7	1	8	41	15	0	0	15	1	0	44	50	1	**183**
7:45 AM	to	8:00 AM	0	0	1	7	0	2	20	10	0	0	11	1	0	17	16	1	**86**
8:00 AM	to	8:15 AM	0	1	5	8	0	2	27	9	0	2	20	0	0	19	18	1	**112**
8:15 AM	to	8:30 AM	0	1	3	4	0	3	19	7	0	1	17	0	0	10	22	0	**87**
8:30 AM	to	8:45 AM	0	1	8	10	0	2	17	8	0	0	11	0	0	7	19	0	**83**
8:45 AM	to	9:00 AM	0	0	3	3	0	2	5	4	0	0	16	0	0	9	21	0	**63**
HOURLY TOTALS																			
7:00 AM	to	8:00 AM	0	1	7	23	2	21	139	48	0	0	48	2	0	163	172	4	**630**
7:15 AM	to	8:15 AM	0	1	10	26	1	16	124	46	0	2	57	2	0	139	148	4	**576**
7:30 AM	to	8:30 AM	0	2	9	26	1	15	107	41	0	3	63	2	0	90	106	3	**468**
7:45 AM	to	8:45 AM	0	3	17	29	0	9	83	34	0	3	59	1	0	53	75	2	**368**
8:00 AM	to	9:00 AM	0	3	19	25	0	9	68	28	0	3	64	0	0	45	80	1	**345**

PEAK HOUR SUMMARY

7:00 AM to 8:00 AM	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	TOTAL
VOLUME	0	1	7	23	2	21	139	48	0	0	48	2	0	163	172	4	**630**
PEDESTRIAN																	**3**
BICYCLE																	**4**
PHF BY MOVEMENT	0.00	0.25	0.44	0.82	0.50	0.66	0.83	0.80	0.00	0.00	0.80	0.50	0.00	0.69	0.67	1.00	OVERALL
PHF BY APPROACH	0.97				0.81				0.78				0.68				0.81

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Appendix B – Existing Conditions Intersections Level of Service Analysis Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	0	52	49	1	15	14	1075	13	6	1981	5
Future Volume (vph)	13	0	52	49	1	15	14	1075	13	6	1981	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5		4.0	4.0		3.5	5.0	5.0	3.5	5.0	5.0
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.89		1.00	0.86		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1700		1829	1651		1829	3657	1636	1829	3657	1636
Flt Permitted		0.94		0.48	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1621		930	1651		1829	3657	1636	1829	3657	1636
Peak-hour factor, PHF	0.63	0.63	0.63	0.77	0.77	0.77	0.93	0.93	0.93	0.96	0.96	0.96
Adj. Flow (vph)	21	0	83	64	1	19	15	1156	14	6	2064	5
RTOR Reduction (vph)	0	73	0	0	17	0	0	0	3	0	0	1
Lane Group Flow (vph)	0	31	0	64	3	0	15	1156	11	6	2064	4
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)		15.1		14.6	14.6		2.7	101.7	101.7	1.2	100.2	100.2
Effective Green, g (s)		15.1		14.6	14.6		2.7	101.7	101.7	1.2	100.2	100.2
Actuated g/C Ratio		0.12		0.11	0.11		0.02	0.78	0.78	0.01	0.77	0.77
Clearance Time (s)		3.5		4.0	4.0		3.5	5.0	5.0	3.5	5.0	5.0
Vehicle Extension (s)		2.0		2.0	2.0		2.0	4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)		188		104	185		37	2860	1279	16	2818	1260
v/s Ratio Prot					0.00		c0.01	0.32		0.00	c0.56	
v/s Ratio Perm		0.02		c0.07					0.01			0.00
v/c Ratio		0.16		0.62	0.02		0.41	0.40	0.01	0.38	0.73	0.00
Uniform Delay, d1		51.8		55.0	51.3		62.9	4.5	3.1	64.0	7.8	3.4
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.1		7.4	0.0		2.6	0.4	0.0	5.3	1.7	0.0
Delay (s)		51.9		62.4	51.3		65.5	4.9	3.1	69.3	9.6	3.4
Level of Service		D		E	D		E	A	A	E	A	A
Approach Delay (s)		51.9			59.8			5.7			9.7	
Approach LOS		D			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	72.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: Dougherty Rd. & Dublin Blvd.

7/22/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	241	369	256	614	365	568	908	322	444	1517	71
Future Volume (vph)	43	241	369	256	614	365	568	908	322	444	1517	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	5.0	5.0	5.5	5.5	5.0	5.5	5.5	5.0	5.5	
Lane Util. Factor	0.97	0.91	0.88	0.94	0.91	1.00	0.94	0.91	0.88	0.97	0.86	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3547	5255	2880	5157	5255	1636	5157	5255	2880	3547	6577	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3547	5255	2880	5157	5255	1636	5157	5255	2880	3547	6577	
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.95	0.95	0.95	0.96	0.96	0.96
Adj. Flow (vph)	45	254	388	281	675	401	598	956	339	462	1580	74
RTOR Reduction (vph)	0	0	55	0	0	269	0	0	229	0	4	0
Lane Group Flow (vph)	45	254	333	281	675	132	598	956	110	463	1650	0
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	4.9	17.8	37.3	15.3	28.7	28.7	19.5	35.8	35.8	19.9	36.2	
Effective Green, g (s)	4.9	17.8	37.3	15.3	28.7	28.7	19.5	35.8	35.8	19.9	36.2	
Actuated g/C Ratio	0.04	0.16	0.34	0.14	0.26	0.26	0.18	0.32	0.32	0.18	0.33	
Clearance Time (s)	5.0	6.0	5.0	5.0	5.5	5.5	5.0	5.5	5.5	5.0	5.5	
Vehicle Extension (s)	2.0	4.5	2.0	2.0	4.5	4.5	2.0	4.5	4.5	2.0	4.5	
Lane Grp Cap (vph)	157	848	973	715	1367	425	911	1705	934	639	2158	
v/s Ratio Prot	0.01	0.05	0.06	c0.05	c0.13		0.12	0.18		c0.13	c0.25	
v/s Ratio Perm			0.06			0.08			0.04			
v/c Ratio	0.29	0.30	0.34	0.39	0.49	0.31	0.66	0.56	0.12	0.72	0.76	
Uniform Delay, d1	51.0	40.8	27.3	43.3	34.6	32.8	42.3	30.8	26.2	42.6	33.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.3	0.1	0.1	0.5	0.7	1.3	0.6	0.1	3.5	1.9	
Delay (s)	51.4	41.1	27.4	43.4	35.1	33.6	43.6	31.4	26.3	46.1	35.1	
Level of Service	D	D	C	D	D	C	D	C	C	D	D	
Approach Delay (s)		34.0			36.4			34.3			37.5	
Approach LOS		C			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	35.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	110.3	Sum of lost time (s)	21.5
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	395	708	1099	0	0	1606
Future Volume (vph)	395	708	1099	0	0	1606
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0			3.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	5255			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	5255			5255
Peak-hour factor, PHF	0.95	0.95	0.91	0.91	0.96	0.96
Adj. Flow (vph)	416	745	1208	0	0	1673
RTOR Reduction (vph)	0	59	0	0	0	0
Lane Group Flow (vph)	416	686	1208	0	0	1673
Turn Type	Prot	Prot	NA			NA
Protected Phases	4	4	2			6
Permitted Phases	4					
Actuated Green, G (s)	18.4	18.4	29.6			29.6
Effective Green, g (s)	21.4	21.4	32.6			32.6
Actuated g/C Ratio	0.36	0.36	0.54			0.54
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	5.0	5.0	5.0			1.8
Lane Grp Cap (vph)	1265	1027	2855			2855
v/s Ratio Prot	0.12	c0.24	0.23			c0.32
v/s Ratio Perm						
v/c Ratio	0.33	0.67	0.42			0.59
Uniform Delay, d1	14.1	16.3	8.1			9.2
Progression Factor	1.00	1.00	1.16			1.00
Incremental Delay, d2	0.3	2.2	0.4			0.9
Delay (s)	14.4	18.5	9.9			10.1
Level of Service	B	B	A			B
Approach Delay (s)	17.0		9.9			10.1
Approach LOS	B		A			B

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	605	1686	0	886	1425	0
Future Volume (vph)	605	1686	0	886	1425	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	
Lane Util. Factor	0.97	0.88		0.91	0.91	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3547	2880		5255	5255	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3547	2880		5255	5255	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	651	1813	0	953	1532	0
RTOR Reduction (vph)	0	3	0	0	0	0
Lane Group Flow (vph)	651	1810	0	953	1532	0
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases	4			2		
Actuated Green, G (s)	29.0	29.0		19.0	19.0	
Effective Green, g (s)	32.0	32.0		22.0	22.0	
Actuated g/C Ratio	0.53	0.53		0.37	0.37	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	1.8	1.8		5.0	5.0	
Lane Grp Cap (vph)	1891	1536		1926	1926	
v/s Ratio Prot	0.18	c0.63		0.18	c0.29	
v/s Ratio Perm						
v/c Ratio	0.34	1.18		0.49	0.80	
Uniform Delay, d1	8.0	14.0		14.7	17.0	
Progression Factor	1.00	1.00		1.00	0.74	
Incremental Delay, d2	0.0	87.4		0.9	3.1	
Delay (s)	8.0	101.4		15.6	15.7	
Level of Service	A	F		B	B	
Approach Delay (s)	76.8			15.6	15.7	
Approach LOS	E			B	B	

Intersection Summary			
HCM 2000 Control Delay	46.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	6	800	138	36	1167	66	30
Future Volume (vph)	6	800	138	36	1167	66	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1829	5255	1636	1829	5255	1829	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1829	5255	1636	1829	5255	1829	1636
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.92
Adj. Flow (vph)	6	860	148	39	1268	72	33
RTOR Reduction (vph)	0	0	39	0	0	0	30
Lane Group Flow (vph)	6	860	109	39	1268	72	3
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm
Protected Phases	5	2		1	6		
Permitted Phases			2			8	8
Actuated Green, G (s)	1.2	95.5	95.5	6.3	100.6	12.7	12.7
Effective Green, g (s)	1.2	95.5	95.5	6.3	100.6	12.7	12.7
Actuated g/C Ratio	0.01	0.73	0.73	0.05	0.77	0.10	0.10
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0	5.0	5.0
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5	2.0	2.0
Lane Grp Cap (vph)	16	3860	1201	88	4066	178	159
v/s Ratio Prot	0.00	0.16		c0.02	c0.24		
v/s Ratio Perm			0.07			c0.04	0.00
v/c Ratio	0.38	0.22	0.09	0.44	0.31	0.40	0.02
Uniform Delay, d1	64.0	5.5	4.9	60.1	4.4	55.1	53.0
Progression Factor	1.00	1.00	1.00	0.81	1.83	1.00	1.00
Incremental Delay, d2	5.3	0.1	0.1	1.3	0.2	0.5	0.0
Delay (s)	69.3	5.6	5.1	49.8	8.2	55.6	53.0
Level of Service	E	A	A	D	A	E	D
Approach Delay (s)		5.9			9.5	54.8	
Approach LOS		A			A	D	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	43.8%	ICU Level of Service	A
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 (vph)	38	665	149	40	1055	0	128	0	60	0	0	0
Future Volume (vph)	38	665	149	40	1055	0	128	0	60	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0		4.5	4.5				
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		1.00	1.00				
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85				
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00				
Satd. Flow (prot)	3547	5255	1636	1829	5255		1829	1636				
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00				
Satd. Flow (perm)	3547	5255	1636	1829	5255		1829	1636				
Peak-hour factor, PHF	0.90	0.90	0.90	0.94	0.94	0.94	0.84	0.84	0.84	0.25	0.25	0.25
Adj. Flow (vph)	42	739	166	43	1122	0	152	0	71	0	0	0
RTOR Reduction (vph)	0	0	51	0	0	0	0	61	0	0	0	0
Lane Group Flow (vph)	42	739	115	43	1122	0	152	10	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	5.0	90.3	90.3	6.5	91.8		18.2	18.2				
Effective Green, g (s)	5.0	90.3	90.3	6.5	91.8		18.2	18.2				
Actuated g/C Ratio	0.04	0.69	0.69	0.05	0.71		0.14	0.14				
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0		4.5	4.5				
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5		2.0	2.0				
Lane Grp Cap (vph)	136	3650	1136	91	3710		256	229				
v/s Ratio Prot	0.01	0.14		c0.02	c0.21		c0.08	0.01				
v/s Ratio Perm			0.07									
v/c Ratio	0.31	0.20	0.10	0.47	0.30		0.59	0.04				
Uniform Delay, d1	60.8	7.1	6.5	60.1	7.1		52.4	48.4				
Progression Factor	0.96	0.94	2.63	1.14	0.54		1.00	1.00				
Incremental Delay, d2	0.5	0.1	0.2	1.4	0.2		2.5	0.0				
Delay (s)	58.9	6.8	17.3	69.7	4.1		54.9	48.4				
Level of Service	E	A	B	E	A		D	D				
Approach Delay (s)		10.9			6.5			52.8			0.0	
Approach LOS		B			A			D			A	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	43.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	611	132	61	946	140	54
Future Volume (vph)	611	132	61	946	140	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	4.5	5.5	4.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	5255	1636	1829	5255	3453	
Flt Permitted	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (perm)	5255	1636	1829	5255	3453	
Peak-hour factor, PHF	0.90	0.90	0.92	0.92	0.85	0.85
Adj. Flow (vph)	679	147	66	1028	165	64
RTOR Reduction (vph)	0	52	0	0	38	0
Lane Group Flow (vph)	679	95	66	1028	191	0
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	83.7	83.7	8.0	96.2	23.8	
Effective Green, g (s)	83.7	83.7	8.0	96.2	23.8	
Actuated g/C Ratio	0.64	0.64	0.06	0.74	0.18	
Clearance Time (s)	5.5	5.5	4.5	5.5	4.5	
Vehicle Extension (s)	4.5	4.5	2.0	4.5	2.0	
Lane Grp Cap (vph)	3383	1053	112	3888	632	
v/s Ratio Prot	0.13		c0.04	c0.20	c0.06	
v/s Ratio Perm		0.06				
v/c Ratio	0.20	0.09	0.59	0.26	0.30	
Uniform Delay, d1	9.5	8.8	59.4	5.5	45.9	
Progression Factor	1.00	3.20	0.76	1.34	1.00	
Incremental Delay, d2	0.1	0.2	4.6	0.2	0.1	
Delay (s)	9.6	28.1	49.6	7.5	46.0	
Level of Service	A	C	D	A	D	
Approach Delay (s)	12.9			10.0	46.0	
Approach LOS	B			B	D	

Intersection Summary			
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	33.0%	ICU Level of Service	A
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 (vph)	195	467	5	30	630	29	13	21	22	9	82	378
Future Volume (vph)	195	467	5	30	630	29	13	21	22	9	82	378
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5	5.5	4.5	5.5	5.5	4.5	5.0	5.0	4.5	5.0	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	0.85	1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1829	5255	1636	3547	5255	1636	3547	1804	1554	1829	1687	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1829	5255	1636	3547	5255	1636	3547	1804	1554	1829	1687	
Peak-hour factor, PHF	0.81	0.81	0.81	0.93	0.93	0.93	0.67	0.67	0.67	0.88	0.88	0.88
Adj. Flow (vph)	241	577	6	32	677	31	19	31	33	10	93	430
RTOR Reduction (vph)	0	0	3	0	0	19	0	2	22	0	153	0
Lane Group Flow (vph)	241	577	3	32	677	12	19	32	8	10	370	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	21.5	69.2	69.2	4.5	52.2	52.2	2.3	35.5	35.5	1.3	34.5	
Effective Green, g (s)	21.5	69.2	69.2	4.5	52.2	52.2	2.3	35.5	35.5	1.3	34.5	
Actuated g/C Ratio	0.17	0.53	0.53	0.03	0.40	0.40	0.02	0.27	0.27	0.01	0.27	
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5	5.5	4.5	5.0	5.0	4.5	5.0	
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5	4.5	2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	302	2797	870	122	2110	656	62	492	424	18	447	
v/s Ratio Prot	c0.13	0.11		0.01	c0.13		0.01	0.02		c0.01	c0.22	
v/s Ratio Perm			0.00			0.01			0.01			
v/c Ratio	0.80	0.21	0.00	0.26	0.32	0.02	0.31	0.06	0.02	0.56	0.83	
Uniform Delay, d1	52.2	16.0	14.2	61.1	26.7	23.5	63.1	35.0	34.5	64.1	45.0	
Progression Factor	0.76	1.22	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.7	0.2	0.0	0.4	0.4	0.1	1.0	0.1	0.0	19.4	12.5	
Delay (s)	52.1	19.6	14.3	61.6	27.1	23.5	64.1	35.0	34.6	83.4	57.5	
Level of Service	D	B	B	E	C	C	E	D	C	F	E	
Approach Delay (s)		29.1			28.5			41.5			57.9	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	36.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	89	0	177	47	8	384
Future Volume (vph)	89	0	177	47	8	384
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0		3.0	3.1		3.0
Lane Util. Factor	1.00		1.00	1.00		1.00
Frt	1.00		1.00	0.85		1.00
Flt Protected	0.95		1.00	1.00		1.00
Satd. Flow (prot)	1829		1925	1636		1923
Flt Permitted	0.95		1.00	1.00		1.00
Satd. Flow (perm)	1829		1925	1636		1916
Peak-hour factor, PHF	0.82	0.82	0.88	0.88	0.90	0.90
Adj. Flow (vph)	109	0	201	53	9	427
RTOR Reduction (vph)	0	0	0	11	0	0
Lane Group Flow (vph)	109	0	201	42	0	436
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	9.1		62.7	62.7		62.7
Effective Green, g (s)	10.2		63.8	63.7		63.8
Actuated g/C Ratio	0.13		0.80	0.80		0.80
Clearance Time (s)	4.1		4.1	4.1		4.1
Vehicle Extension (s)	3.0		3.0	3.0		3.0
Lane Grp Cap (vph)	233		1535	1302		1528
v/s Ratio Prot	c0.06		0.10			
v/s Ratio Perm				0.03		c0.23
v/c Ratio	0.47		0.13	0.03		0.29
Uniform Delay, d1	32.4		1.8	1.7		2.1
Progression Factor	1.00		1.00	1.00		1.00
Incremental Delay, d2	1.5		0.2	0.0		0.5
Delay (s)	33.9		2.0	1.8		2.6
Level of Service	C		A	A		A
Approach Delay (s)	33.9		2.0			2.6
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	41.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBU	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	101	14	288	363	10	22	204
Future Volume (vph)	101	14	288	363	10	22	204
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.1	3.0	3.0		3.0	3.0
Lane Util. Factor	0.95	1.00	1.00	0.95		1.00	1.00
Frt	1.00	0.85	1.00	1.00		1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	3657	1636	1829	3657		1829	1636
Flt Permitted	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	3657	1636	1829	3657		1829	1636
Peak-hour factor, PHF	0.73	0.73	0.81	0.81	0.76	0.76	0.76
Adj. Flow (vph)	138	19	356	448	13	29	268
RTOR Reduction (vph)	0	14	0	0	0	0	183
Lane Group Flow (vph)	138	5	356	448	0	42	85
Turn Type	NA	Perm	Prot	NA	Perm	Prot	Perm
Protected Phases	4		3	8		2	
Permitted Phases		4			2		2
Actuated Green, G (s)	15.9	15.9	19.3	39.3		20.5	20.5
Effective Green, g (s)	17.0	16.9	20.4	40.4		21.6	21.6
Actuated g/C Ratio	0.25	0.25	0.30	0.59		0.32	0.32
Clearance Time (s)	4.1	4.1	4.1	4.1		4.1	4.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	914	406	548	2172		580	519
v/s Ratio Prot	0.04		c0.19	c0.12			
v/s Ratio Perm		0.00				0.02	c0.05
v/c Ratio	0.15	0.01	0.65	0.21		0.07	0.16
Uniform Delay, d1	19.9	19.3	20.7	6.4		16.2	16.7
Progression Factor	1.00	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	0.0	2.7	0.0		0.2	0.7
Delay (s)	20.0	19.3	23.4	6.4		16.4	17.4
Level of Service	B	B	C	A		B	B
Approach Delay (s)	19.9			13.9		17.3	
Approach LOS	B			B		B	

Intersection Summary			
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	68.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
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 (vph)	60	302	77	264	728	74	147	552	115	14	387	132
Future Volume (vph)	60	302	77	264	728	74	147	552	115	14	387	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0	5.0	4.5	6.0		5.0	6.0	6.0	4.5	5.5	5.5
Lane Util. Factor	0.97	0.91	0.88	0.97	0.91		0.94	0.95	0.88	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	2840	3547	5171		5157	3657	2819	3547	5255	1597
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	2840	3547	5171		5157	3657	2819	3547	5255	1597
Peak-hour factor, PHF	0.76	0.76	0.76	0.83	0.83	0.83	0.93	0.93	0.93	0.81	0.81	0.81
Adj. Flow (vph)	79	397	101	318	877	89	158	594	124	17	478	163
RTOR Reduction (vph)	0	0	44	0	6	0	0	0	97	0	0	137
Lane Group Flow (vph)	79	397	57	318	960	0	158	594	27	17	478	26
Confl. Peds. (#/hr)			4			9			7			7
Confl. Bikes (#/hr)			1			1						3
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	7.4	65.7	78.2	16.7	75.0		12.5	30.4	30.4	3.7	21.6	21.6
Effective Green, g (s)	7.4	65.7	78.2	16.7	75.0		12.5	30.4	30.4	3.7	21.6	21.6
Actuated g/C Ratio	0.05	0.48	0.57	0.12	0.55		0.09	0.22	0.22	0.03	0.16	0.16
Clearance Time (s)	4.5	6.0	5.0	4.5	6.0		5.0	6.0	6.0	4.5	5.5	5.5
Vehicle Extension (s)	2.0	3.5	2.0	2.0	3.5		2.0	3.5	3.5	2.0	3.5	3.5
Lane Grp Cap (vph)	190	2510	1615	430	2820		468	808	623	95	825	250
v/s Ratio Prot	0.02	0.08	0.00	c0.09	c0.19		c0.03	c0.16		0.00	0.09	
v/s Ratio Perm			0.02						0.01			0.02
v/c Ratio	0.42	0.16	0.04	0.74	0.34		0.34	0.74	0.04	0.18	0.58	0.10
Uniform Delay, d1	63.0	20.3	13.1	58.3	17.4		58.6	49.8	42.1	65.4	53.7	49.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.1	0.0	5.7	0.3		0.2	3.6	0.0	0.3	1.1	0.2
Delay (s)	63.5	20.4	13.1	64.0	17.8		58.8	53.4	42.2	65.7	54.8	49.9
Level of Service	E	C	B	E	B		E	D	D	E	D	D
Approach Delay (s)		25.0			29.2			52.8			53.9	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	39.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	137.5	Sum of lost time (s)	21.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
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 (vph)	6	8	152	91	16	12	234	824	121	11	654	37
Future Volume (vph)	6	8	152	91	16	12	234	824	121	11	654	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.1	4.1	4.1		4.1	4.1	4.1	4.1	4.1	
Lane Util. Factor	1.00	0.91	0.91	0.97	1.00		0.97	0.91	1.00	0.97	0.86	
Frt	1.00	0.87	0.85	1.00	0.94		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1829	1528	2978	3547	1804		3547	5255	1636	3547	6568	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1829	1528	2978	3547	1804		3547	5255	1636	3547	6568	
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.90	0.90	0.91	0.91	0.91	0.86	0.86	0.86
Adj. Flow (vph)	7	9	173	101	18	13	257	905	133	13	760	43
RTOR Reduction (vph)	0	38	89	0	9	0	0	0	55	0	5	0
Lane Group Flow (vph)	7	23	32	101	22	0	257	905	78	13	798	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	1.6	34.2	34.2	8.1	40.7		13.6	68.1	76.2	3.2	57.7	
Effective Green, g (s)	1.6	34.2	34.2	8.1	40.7		13.6	68.1	76.2	3.2	57.7	
Actuated g/C Ratio	0.01	0.26	0.26	0.06	0.31		0.10	0.52	0.59	0.02	0.44	
Clearance Time (s)	4.1	4.1	4.1	4.1	4.1		4.1	4.1	4.1	4.1	4.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	22	401	783	221	564		371	2752	1010	87	2915	
v/s Ratio Prot	0.00	c0.01		c0.03	0.01		c0.07	c0.17	0.00	0.00	0.12	
v/s Ratio Perm			0.01						0.04			
v/c Ratio	0.32	0.06	0.04	0.46	0.04		0.69	0.33	0.08	0.15	0.27	
Uniform Delay, d1	63.7	35.8	35.7	58.8	31.1		56.2	17.8	11.7	62.1	22.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.2	0.1	0.0	1.5	0.0		5.5	0.3	0.0	0.8	0.2	
Delay (s)	71.8	35.9	35.7	60.3	31.1		61.7	18.1	11.7	62.9	23.1	
Level of Service	E	D	D	E	C		E	B	B	E	C	
Approach Delay (s)		37.1			53.5			26.1			23.8	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	453	201	851	0	0	526
Future Volume (vph)	453	201	851	0	0	526
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.5	1.5	2.0			2.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frpb, ped/bikes	1.00	1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	5255			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	5255			5255
Peak-hour factor, PHF	0.95	0.95	0.93	0.93	0.88	0.88
Adj. Flow (vph)	477	212	915	0	0	598
RTOR Reduction (vph)	0	135	0	0	0	0
Lane Group Flow (vph)	477	77	915	0	0	598
Confl. Peds. (#/hr)				3		
Confl. Bikes (#/hr)				1		
Turn Type	Prot	Prot	NA			NA
Protected Phases	8	8	2			6
Permitted Phases						
Actuated Green, G (s)	9.4	9.4	15.2			15.2
Effective Green, g (s)	12.4	12.4	18.2			18.2
Actuated g/C Ratio	0.36	0.36	0.53			0.53
Clearance Time (s)	4.5	4.5	5.0			5.0
Vehicle Extension (s)	2.0	2.0	3.5			3.5
Lane Grp Cap (vph)	1289	1047	2804			2804
v/s Ratio Prot	c0.13	0.03	c0.17			0.11
v/s Ratio Perm						
v/c Ratio	0.37	0.07	0.33			0.21
Uniform Delay, d1	8.0	7.1	4.5			4.2
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.1	0.0	0.1			0.0
Delay (s)	8.0	7.1	4.6			4.2
Level of Service	A	A	A			A
Approach Delay (s)	7.8		4.6			4.2
Approach LOS	A		A			A

Intersection Summary			
HCM 2000 Control Delay	5.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	34.1	Sum of lost time (s)	3.5
Intersection Capacity Utilization	36.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	678	975	0	339	879	0
Future Volume (vph)	678	975	0	339	879	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.5	1.5		2.0	2.1	
Lane Util. Factor	0.97	0.88		0.91	0.91	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3547	2880		5255	5255	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3547	2880		5255	5255	
Peak-hour factor, PHF	0.96	0.96	0.90	0.90	0.90	0.90
Adj. Flow (vph)	706	1016	0	377	977	0
RTOR Reduction (vph)	0	110	0	0	0	0
Lane Group Flow (vph)	706	906	0	377	977	0
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases	4					
Actuated Green, G (s)	18.5	18.5		17.2	17.2	
Effective Green, g (s)	21.5	21.5		20.2	20.1	
Actuated g/C Ratio	0.48	0.48		0.45	0.44	
Clearance Time (s)	4.5	4.5		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		3.5	3.5	
Lane Grp Cap (vph)	1687	1369		2348	2336	
v/s Ratio Prot	0.20	c0.31		0.07	c0.19	
v/s Ratio Perm						
v/c Ratio	0.42	0.66		0.16	0.42	
Uniform Delay, d1	7.8	9.1		7.4	8.6	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.9		0.0	0.1	
Delay (s)	7.8	10.0		7.5	8.7	
Level of Service	A	B		A	A	
Approach Delay (s)	9.1			7.5	8.7	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	45.2	Sum of lost time (s)	3.6
Intersection Capacity Utilization	71.9%	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 (vph)	75	317	12	37	862	21	28	7	7	23	23	172
Future Volume (vph)	75	317	12	37	862	21	28	7	7	23	23	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1829	5255	1636	3547	5236		1829	1925	1636	1829	1925	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1829	5255	1636	3547	5236		1829	1925	1636	1829	1925	1636
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	83	352	13	41	958	23	31	8	8	26	26	191
RTOR Reduction (vph)	0	0	5	0	1	0	0	0	7	0	0	166
Lane Group Flow (vph)	83	352	8	41	980	0	31	8	1	26	26	25
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	8.7	65.3	65.3	4.4	61.0		4.7	15.6	15.6	3.2	14.1	14.1
Effective Green, g (s)	8.7	65.3	65.3	4.4	61.0		4.7	15.6	15.6	3.2	14.1	14.1
Actuated g/C Ratio	0.08	0.62	0.62	0.04	0.58		0.04	0.15	0.15	0.03	0.13	0.13
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	150	3237	1007	147	3013		81	283	240	55	256	217
v/s Ratio Prot	c0.05	0.07		0.01	c0.19		c0.02	0.00		0.01	0.01	
v/s Ratio Perm			0.00						0.00			c0.02
v/c Ratio	0.55	0.11	0.01	0.28	0.33		0.38	0.03	0.00	0.47	0.10	0.12
Uniform Delay, d1	46.8	8.4	7.9	49.3	11.8		49.2	38.7	38.6	50.6	40.4	40.5
Progression Factor	1.00	1.00	1.00	1.21	0.60		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.4	0.1	0.0	1.0	0.3		3.0	0.0	0.0	6.3	0.2	0.2
Delay (s)	51.1	8.4	7.9	60.6	7.4		52.2	38.7	38.6	56.9	40.6	40.7
Level of Service	D	A	A	E	A		D	D	D	E	D	D
Approach Delay (s)		16.3			9.5			47.6			42.4	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	106.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	42.4%	ICU Level of Service	A
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 (vph)	5	331	49	109	859	5	46	0	34	14	0	18
Future Volume (vph)	5	331	49	109	859	5	46	0	34	14	0	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.91		0.97	0.91			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.98	
Satd. Flow (prot)	1829	5154		3547	5250			1829	1636		1742	
Flt Permitted	0.95	1.00		0.95	1.00			0.83	1.00		0.88	
Satd. Flow (perm)	1829	5154		3547	5250			1588	1636		1572	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	368	54	121	954	6	51	0	38	16	0	20
RTOR Reduction (vph)	0	10	0	0	0	0	0	0	33	0	31	0
Lane Group Flow (vph)	6	412	0	121	960	0	0	51	5	0	5	0
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	1.4	69.4		9.0	77.0			14.1	14.1		14.1	
Effective Green, g (s)	1.4	69.4		9.0	77.0			14.1	14.1		14.1	
Actuated g/C Ratio	0.01	0.65		0.08	0.73			0.13	0.13		0.13	
Clearance Time (s)	4.0	5.5		4.0	5.5			4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	24	3374		301	3813			211	217		209	
v/s Ratio Prot	0.00	0.08		c0.03	c0.18							
v/s Ratio Perm								c0.03	0.00		0.00	
v/c Ratio	0.25	0.12		0.40	0.25			0.24	0.02		0.02	
Uniform Delay, d1	51.8	6.9		46.0	4.9			41.2	40.0		40.0	
Progression Factor	1.20	0.56		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	5.4	0.1		0.9	0.2			0.6	0.0		0.0	
Delay (s)	67.7	3.9		46.8	5.0			41.8	40.0		40.0	
Level of Service	E	A		D	A			D	D		D	
Approach Delay (s)		4.8			9.7			41.0			40.0	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	106.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	39.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations												
Traffic Volume (vph)	6	74	104	167	460	479	31	239	451	111	1	23
Future Volume (vph)	6	74	104	167	460	479	31	239	451	111	1	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.0	6.0	5.0	5.0	6.0		5.0	6.0	6.0		5.0
Lane Util. Factor		0.97	0.95	0.88	0.94	0.95		0.94	0.95	1.00		0.97
Frt		1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85		1.00
Flt Protected		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.95
Satd. Flow (prot)		3547	3657	2880	5157	3624		5157	3657	1636		3547
Flt Permitted		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00		0.47
Satd. Flow (perm)		3547	3657	2880	5157	3624		5157	3657	1636		1737
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.89	0.89	0.89	0.94	0.94	0.94	0.85	0.85
Adj. Flow (vph)	7	81	114	184	517	538	35	254	480	118	1	27
RTOR Reduction (vph)	0	0	0	53	0	3	0	0	0	79	0	0
Lane Group Flow (vph)	0	88	114	131	517	570	0	254	480	39	0	28
Turn Type	Prot	Prot	NA	pm+ov	Prot	NA		Prot	NA	Perm	custom	Prot
Protected Phases	5	5	2	3	1	6		3	8			7
Permitted Phases				2						8	7	
Actuated Green, G (s)		16.1	21.1	37.2	16.7	21.7		16.1	34.4	34.4		8.6
Effective Green, g (s)		16.1	21.1	37.2	16.7	21.7		16.1	34.4	34.4		8.6
Actuated g/C Ratio		0.16	0.21	0.36	0.16	0.21		0.16	0.33	0.33		0.08
Clearance Time (s)		5.0	6.0	5.0	5.0	6.0		5.0	6.0	6.0		5.0
Vehicle Extension (s)		2.0	3.0	2.0	2.0	3.0		2.0	4.0	4.0		2.0
Lane Grp Cap (vph)		555	750	1042	837	764		807	1223	547		145
v/s Ratio Prot		0.02	0.03	0.02	c0.10	c0.16		c0.05	c0.13			
v/s Ratio Perm				0.03						0.02		0.02
v/c Ratio		0.16	0.15	0.13	0.62	0.75		0.31	0.39	0.07		0.19
Uniform Delay, d1		37.5	33.5	21.9	40.1	38.0		38.5	26.2	23.3		43.9
Progression Factor		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00		1.00
Incremental Delay, d2		0.0	0.1	0.0	1.0	4.0		0.1	0.3	0.1		0.2
Delay (s)		37.5	33.6	21.9	41.0	42.0		38.5	26.5	23.4		44.1
Level of Service		D	C	C	D	D		D	C	C		D
Approach Delay (s)			28.9			41.5			29.6			
Approach LOS			C			D			C			

Intersection Summary			
HCM 2000 Control Delay	34.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	102.8	Sum of lost time (s)	22.0
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (vph)	872	112
Future Volume (vph)	872	112
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	6.0	6.0
Lane Util. Factor	0.86	0.88
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	6621	2880
Flt Permitted	1.00	1.00
Satd. Flow (perm)	6621	2880
Peak-hour factor, PHF	0.85	0.85
Adj. Flow (vph)	1026	132
RTOR Reduction (vph)	0	97
Lane Group Flow (vph)	1026	35
Turn Type	NA	Perm
Protected Phases	4	
Permitted Phases		4
Actuated Green, G (s)	26.9	26.9
Effective Green, g (s)	26.9	26.9
Actuated g/C Ratio	0.26	0.26
Clearance Time (s)	6.0	6.0
Vehicle Extension (s)	4.0	4.0
Lane Grp Cap (vph)	1732	753
v/s Ratio Prot	c0.15	
v/s Ratio Perm		0.01
v/c Ratio	0.59	0.05
Uniform Delay, d1	33.2	28.4
Progression Factor	1.00	1.00
Incremental Delay, d2	0.6	0.0
Delay (s)	33.8	28.4
Level of Service	C	C
Approach Delay (s)	33.4	
Approach LOS	C	

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	541	255	1053	0	0	847
Future Volume (vph)	541	255	1053	0	0	847
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.1	2.1	2.0			2.0
Lane Util. Factor	0.97	0.88	0.95			0.91
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	3657			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	3657			5255
Peak-hour factor, PHF	0.96	0.96	0.94	0.94	0.90	0.90
Adj. Flow (vph)	564	266	1120	0	0	941
RTOR Reduction (vph)	0	91	0	0	0	0
Lane Group Flow (vph)	564	175	1120	0	0	941
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		6			2
Permitted Phases	4	4				
Actuated Green, G (s)	11.9	11.9	19.9			19.9
Effective Green, g (s)	13.9	13.9	22.9			22.9
Actuated g/C Ratio	0.34	0.34	0.56			0.56
Clearance Time (s)	4.1	4.1	5.0			5.0
Vehicle Extension (s)	3.0	3.0	3.5			3.5
Lane Grp Cap (vph)	1205	978	2047			2942
v/s Ratio Prot	c0.16		c0.31			0.18
v/s Ratio Perm		0.06				
v/c Ratio	0.47	0.18	0.55			0.32
Uniform Delay, d1	10.6	9.5	5.7			4.8
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.3	0.1	0.3			0.1
Delay (s)	10.9	9.6	6.0			4.9
Level of Service	B	A	A			A
Approach Delay (s)	10.5		6.0			4.9
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	40.9	Sum of lost time (s)	6.5
Intersection Capacity Utilization	72.0%	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 (vph)	619	140	682	176	0	328	0	920	94	165	1067	0
Future Volume (vph)	619	140	682	176	0	328	0	920	94	165	1067	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5		4.5		5.0	5.0	4.5	5.0	
Lane Util. Factor	0.97	1.00	1.00	0.97		0.88		0.91	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3547	1925	1636	3547		2880		5255	1636	1829	3657	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3547	1925	1636	3547		2880		5255	1636	1829	3657	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.91	0.91	0.91	0.94	0.94	0.94
Adj. Flow (vph)	666	151	733	189	0	353	0	1011	103	176	1135	0
RTOR Reduction (vph)	0	0	64	0	0	0	0	0	77	0	0	0
Lane Group Flow (vph)	666	151	669	189	0	353	0	1011	26	176	1135	0
Turn Type	Split	NA	Perm	Prot		pt+ov		NA	Perm	Prot	NA	
Protected Phases	4	4		8		1 8		2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	40.6	40.6	40.6	8.1		23.1		26.9	26.9	10.5	41.9	
Effective Green, g (s)	40.6	40.6	40.6	8.1		23.1		26.9	26.9	10.5	41.9	
Actuated g/C Ratio	0.39	0.39	0.39	0.08		0.22		0.26	0.26	0.10	0.40	
Clearance Time (s)	4.5	4.5	4.5	4.5				5.0	5.0	4.5	5.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0				3.5	3.5	2.0	3.5	
Lane Grp Cap (vph)	1376	747	635	274		636		1351	420	183	1464	
v/s Ratio Prot	0.19	0.08		0.05		c0.12		0.19		c0.10	c0.31	
v/s Ratio Perm			c0.41						0.02			
v/c Ratio	0.48	0.20	1.05	0.69		0.56		0.75	0.06	0.96	0.78	
Uniform Delay, d1	24.1	21.2	32.0	47.0		36.2		35.7	29.3	46.9	27.3	
Progression Factor	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.0	50.8	5.7		0.6		2.4	0.1	54.8	2.7	
Delay (s)	24.2	21.3	82.8	52.7		36.8		38.1	29.4	101.7	30.0	
Level of Service	C	C	F	D		D		D	C	F	C	
Approach Delay (s)		51.6			42.3			37.3			39.6	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	43.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	104.6	Sum of lost time (s)	18.5
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
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 (vph)	45	48	2	163	172	4	1	7	23	23	139	48
Future Volume (vph)	45	48	2	163	172	4	1	7	23	23	139	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1		4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	
Lane Util. Factor	1.00	1.00		0.97	0.95	1.00	1.00	0.91	0.91	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.91	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1829	1910		3547	3657	1611	1829	3171	1489	1829	3517	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1829	1910		3547	3657	1611	1829	3171	1489	1829	3517	
Peak-hour factor, PHF	0.78	0.78	0.78	0.68	0.68	0.68	0.97	0.97	0.97	0.81	0.81	0.81
Adj. Flow (vph)	58	62	3	240	253	6	1	7	24	28	172	59
RTOR Reduction (vph)	0	2	0	0	0	5	0	5	5	0	23	0
Lane Group Flow (vph)	58	63	0	240	253	1	1	14	7	28	208	0
Confl. Peds. (#/hr)			1			2						
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	5.5	14.0		11.1	19.6	19.6	1.2	54.4	54.4	4.1	57.3	
Effective Green, g (s)	5.5	14.0		11.1	19.6	19.6	1.2	54.4	54.4	4.1	57.3	
Actuated g/C Ratio	0.06	0.14		0.11	0.20	0.20	0.01	0.54	0.54	0.04	0.57	
Clearance Time (s)	4.1	4.1		4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	100	267		393	716	315	21	1725	810	74	2015	
v/s Ratio Prot	0.03	0.03		c0.07	c0.07		0.00	0.00		c0.02	c0.06	
v/s Ratio Perm						0.00			0.00			
v/c Ratio	0.58	0.24		0.61	0.35	0.00	0.05	0.01	0.01	0.38	0.10	
Uniform Delay, d1	46.1	38.2		42.4	34.7	32.3	48.8	10.4	10.4	46.7	9.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.9	0.5		2.8	0.3	0.0	0.9	0.0	0.0	3.2	0.1	
Delay (s)	54.0	38.7		45.2	35.0	32.3	49.8	10.4	10.5	49.9	9.8	
Level of Service	D	D		D	D	C	D	B	B	D	A	
Approach Delay (s)		45.9			39.9			11.7			14.1	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	32.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	28.3%	ICU Level of Service	A
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		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	34	0	0	197	7	42	2	118	20	28	306	3
Future Volume (vph)	34	0	0	197	7	42	2	118	20	28	306	3
Peak Hour Factor	0.25	0.25	0.25	0.77	0.77	0.77	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	136	0	0	256	9	55	2	139	24	33	360	4

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total (vph)	136	265	55	72	94	397
Volume Left (vph)	136	256	0	2	0	33
Volume Right (vph)	0	0	55	0	24	4
Hadj (s)	0.23	0.23	-0.57	0.05	-0.15	0.04
Departure Headway (s)	6.3	6.0	3.2	6.4	6.2	5.6
Degree Utilization, x	0.24	0.44	0.05	0.13	0.16	0.62
Capacity (veh/h)	506	554	1121	496	520	612
Control Delay (s)	11.3	13.7	6.4	9.2	9.2	17.3
Approach Delay (s)	11.3	12.5		9.2		17.3
Approach LOS	B	B		A		C

Intersection Summary			
Delay	13.7		
Level of Service	B		
Intersection Capacity Utilization	46.0%	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)	96	143	22	103	408	242	26	163	78	549	810	636
Future Volume (vph)	96	143	22	103	408	242	26	163	78	549	810	636
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	1636	3547	5255	1636	3547	5255	1636	3547	5255	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	1636	3547	5255	1636	3547	5255	1636	3547	5255	1636
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.87	0.92	0.93
Adj. Flow (vph)	113	168	26	121	480	285	31	192	92	631	880	684
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	113	168	26	121	480	285	31	192	92	631	880	684
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			Free			Free			Free			Free
Actuated Green, G (s)	5.4	15.8	76.7	5.4	15.8	76.7	2.1	17.1	76.7	18.4	33.4	76.7
Effective Green, g (s)	6.4	18.8	76.7	6.4	18.8	76.7	3.1	20.1	76.7	19.4	36.4	76.7
Actuated g/C Ratio	0.08	0.25	1.00	0.08	0.25	1.00	0.04	0.26	1.00	0.25	0.47	1.00
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	295	1288	1636	295	1288	1636	143	1377	1636	897	2493	1636
v/s Ratio Prot	0.03	0.03		0.03	0.09		0.01	0.04		c0.18	0.17	
v/s Ratio Perm			0.02			0.17			0.06			c0.42
v/c Ratio	0.38	0.13	0.02	0.41	0.37	0.17	0.22	0.14	0.06	0.70	0.35	0.42
Uniform Delay, d1	33.3	22.6	0.0	33.4	24.1	0.0	35.6	21.7	0.0	26.0	12.7	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.0	0.0	0.9	0.2	0.2	0.8	0.0	0.1	2.5	0.1	0.8
Delay (s)	34.1	22.6	0.0	34.3	24.2	0.2	36.4	21.7	0.1	28.6	12.8	0.8
Level of Service	C	C	A	C	C	A	D	C	A	C	B	A
Approach Delay (s)		24.9			17.9			16.8			13.6	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	76.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
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 (vph)	8	1	32	56	0	26	69	2156	12	17	1410	26
Future Volume (vph)	8	1	32	56	0	26	69	2156	12	17	1410	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5		4.0	4.0		3.5	5.0	4.0	3.5	5.0	4.0
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.89		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1706		1829	1636		1829	3657	1636	1829	3657	1636
Flt Permitted		0.95		0.61	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1636		1183	1636		1829	3657	1636	1829	3657	1636
Peak-hour factor, PHF	0.60	0.60	0.60	0.73	0.73	0.73	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	13	2	53	77	0	36	74	2318	13	18	1533	28
RTOR Reduction (vph)	0	47	0	0	32	0	0	0	13	0	0	28
Lane Group Flow (vph)	0	21	0	77	4	0	74	2318	0	18	1533	0
Turn Type	Perm	NA		Perm	NA		Prot	NA	NA	Prot	NA	NA
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		14.2		13.7	13.7		7.9	101.0	0.0	2.8	95.9	0.0
Effective Green, g (s)		14.2		13.7	13.7		7.9	101.0	0.0	2.8	95.9	0.0
Actuated g/C Ratio		0.11		0.11	0.11		0.06	0.78	0.00	0.02	0.74	0.00
Clearance Time (s)		3.5		4.0	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		178		124	172		111	2841	0	39	2697	0
v/s Ratio Prot					0.00		c0.04	c0.63		0.01	0.42	
v/s Ratio Perm		0.01		c0.07								
v/c Ratio		0.12		0.62	0.02		0.67	0.82	0.00	0.46	0.57	0.00
Uniform Delay, d1		52.2		55.7	52.1		59.8	8.8	65.0	62.9	7.7	65.0
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.1		6.8	0.0		11.1	2.7	0.0	3.1	0.3	0.0
Delay (s)		52.3		62.4	52.2		70.9	11.6	65.0	66.0	8.0	65.0
Level of Service		D		E	D		E	B	E	E	A	E
Approach Delay (s)		52.3			59.2			13.7			9.7	
Approach LOS		D			E			B			A	

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
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 (vph)	150	809	637	386	690	635	752	1434	345	507	1091	95
Future Volume (vph)	150	809	637	386	690	635	752	1434	345	507	1091	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	5.0	5.0	5.5	5.5	5.0	5.5	5.5	5.0	5.5	
Lane Util. Factor	0.97	0.91	0.88	0.94	0.91	1.00	0.94	0.91	0.88	0.97	0.86	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3547	5255	2880	5157	5255	1636	5157	5255	2880	3547	6542	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3547	5255	2880	5157	5255	1636	5157	5255	2880	3547	6542	
Peak-hour factor, PHF	0.91	0.91	0.91	0.93	0.93	0.93	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	165	889	700	415	742	683	775	1478	356	551	1186	103
RTOR Reduction (vph)	0	0	45	0	0	203	0	0	219	0	8	0
Lane Group Flow (vph)	165	889	655	415	742	480	775	1478	137	551	1281	0
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	8.9	40.0	69.2	16.7	48.3	48.3	29.2	50.8	50.8	23.2	44.8	
Effective Green, g (s)	8.9	40.0	69.2	16.7	48.3	48.3	29.2	50.8	50.8	23.2	44.8	
Actuated g/C Ratio	0.06	0.26	0.45	0.11	0.32	0.32	0.19	0.33	0.33	0.15	0.29	
Clearance Time (s)	5.0	6.0	5.0	5.0	5.5	5.5	5.0	5.5	5.5	5.0	5.5	
Vehicle Extension (s)	2.0	4.5	2.0	2.0	4.5	4.5	2.0	4.5	4.5	2.0	4.5	
Lane Grp Cap (vph)	207	1381	1309	565	1667	519	989	1753	961	540	1925	
v/s Ratio Prot	0.05	0.17	0.10	c0.08	0.14		0.15	c0.28		c0.16	0.20	
v/s Ratio Perm			0.13			c0.29			0.05			
v/c Ratio	0.80	0.64	0.50	0.73	0.45	0.93	0.78	0.84	0.14	1.02	0.67	
Uniform Delay, d1	70.8	49.8	29.3	65.6	41.3	50.2	58.5	47.0	35.5	64.5	47.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	17.7	1.3	0.1	4.3	0.3	23.0	3.8	4.2	0.1	44.0	1.1	
Delay (s)	88.5	51.1	29.4	69.9	41.6	73.3	62.3	51.2	35.6	108.5	48.2	
Level of Service	F	D	C	E	D	E	E	D	D	F	D	
Approach Delay (s)		45.9			59.7			52.4			66.2	
Approach LOS		D			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	55.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	152.2	Sum of lost time (s)	21.5
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	295	689	1911	0	0	1412
Future Volume (vph)	295	689	1911	0	0	1412
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0			3.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	5255			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	5255			5255
Peak-hour factor, PHF	0.86	0.86	0.96	0.96	0.95	0.95
Adj. Flow (vph)	343	801	1991	0	0	1486
RTOR Reduction (vph)	0	8	0	0	0	0
Lane Group Flow (vph)	343	793	1991	0	0	1486
Turn Type	Prot	Prot	NA			NA
Protected Phases	4	4	2			6
Permitted Phases	4					
Actuated Green, G (s)	17.9	17.9	30.1			30.1
Effective Green, g (s)	20.9	20.9	33.1			33.1
Actuated g/C Ratio	0.35	0.35	0.55			0.55
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	5.0	5.0	5.0			1.8
Lane Grp Cap (vph)	1235	1003	2899			2899
v/s Ratio Prot	0.10	c0.28	c0.38			0.28
v/s Ratio Perm						
v/c Ratio	0.28	0.79	0.69			0.51
Uniform Delay, d1	14.1	17.6	9.7			8.4
Progression Factor	1.00	1.00	0.78			1.00
Incremental Delay, d2	0.3	4.9	0.1			0.7
Delay (s)	14.4	22.5	7.7			9.1
Level of Service	B	C	A			A
Approach Delay (s)	20.1		7.7			9.1
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	80.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1250	1023	0	2470	1452	0
Future Volume (vph)	1250	1023	0	2470	1452	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	
Lane Util. Factor	0.97	0.88		0.91	0.91	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3547	2880		5255	5255	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3547	2880		5255	5255	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1344	1100	0	2656	1561	0
RTOR Reduction (vph)	0	9	0	0	0	0
Lane Group Flow (vph)	1344	1091	0	2656	1561	0
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases	4			2		
Actuated Green, G (s)	23.8	23.8		24.2	24.2	
Effective Green, g (s)	26.8	26.8		27.2	27.2	
Actuated g/C Ratio	0.45	0.45		0.45	0.45	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	1.8	1.8		5.0	5.0	
Lane Grp Cap (vph)	1584	1286		2382	2382	
v/s Ratio Prot	c0.38	0.38		c0.51	0.30	
v/s Ratio Perm						
v/c Ratio	0.85	0.85		1.12	0.66	
Uniform Delay, d1	14.8	14.8		16.4	12.8	
Progression Factor	1.00	1.00		1.00	1.47	
Incremental Delay, d2	4.3	5.2		58.3	1.3	
Delay (s)	19.1	20.0		74.7	20.1	
Level of Service	B	B		E	C	
Approach Delay (s)	19.5			74.7	20.1	
Approach LOS	B			E	C	

Intersection Summary			
HCM 2000 Control Delay	41.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	133.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	14	1617	21	29	1608	86	52
Future Volume (vph)	14	1617	21	29	1608	86	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.9	5.0	3.4	4.9	3.9	3.9
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1829	5255	1636	1829	5255	1829	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1829	5255	1636	1829	5255	1829	1636
Peak-hour factor, PHF	0.89	0.89	0.89	0.92	0.92	0.77	0.77
Adj. Flow (vph)	16	1817	24	32	1748	112	68
RTOR Reduction (vph)	0	0	4	0	0	0	58
Lane Group Flow (vph)	16	1817	20	32	1748	112	10
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm
Protected Phases	5	2		1	6		
Permitted Phases			2			8	8
Actuated Green, G (s)	2.8	90.4	90.4	6.4	94.0	17.7	17.7
Effective Green, g (s)	3.8	91.5	91.4	7.5	95.1	18.8	18.8
Actuated g/C Ratio	0.03	0.70	0.70	0.06	0.73	0.14	0.14
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0	5.0	5.0
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5	4.5	4.5
Lane Grp Cap (vph)	53	3698	1150	105	3844	264	236
v/s Ratio Prot	0.01	c0.35		0.02	c0.33		
v/s Ratio Perm			0.01			c0.06	0.01
v/c Ratio	0.30	0.49	0.02	0.30	0.45	0.42	0.04
Uniform Delay, d1	61.8	8.7	5.8	58.7	7.0	50.7	47.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	0.5	0.0	0.6	0.4	1.9	0.1
Delay (s)	63.0	9.2	5.8	59.3	7.4	52.6	48.0
Level of Service	E	A	A	E	A	D	D
Approach Delay (s)		9.6			8.3	50.8	
Approach LOS		A			A	D	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	43.7%	ICU Level of Service	A
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 (vph)	13	1506	159	48	1532	0	99	0	59	0	0	0
Future Volume (vph)	13	1506	159	48	1532	0	99	0	59	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0		4.5	4.5				
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		1.00	1.00				
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85				
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00				
Satd. Flow (prot)	3547	5255	1636	1829	5255		1829	1636				
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00				
Satd. Flow (perm)	3547	5255	1636	1829	5255		1829	1636				
Peak-hour factor, PHF	0.91	0.91	0.91	0.94	0.94	0.94	0.90	0.90	0.90	0.25	0.25	0.25
Adj. Flow (vph)	14	1655	175	51	1630	0	110	0	66	0	0	0
RTOR Reduction (vph)	0	0	42	0	0	0	0	58	0	0	0	0
Lane Group Flow (vph)	14	1655	133	51	1630	0	110	8	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	2.2	84.1	84.1	6.8	88.7		14.1	14.1				
Effective Green, g (s)	2.2	84.1	84.1	6.8	88.7		14.1	14.1				
Actuated g/C Ratio	0.02	0.70	0.70	0.06	0.74		0.12	0.12				
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0		4.5	4.5				
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5		2.0	2.0				
Lane Grp Cap (vph)	65	3682	1146	103	3884		214	192				
v/s Ratio Prot	0.00	c0.31		c0.03	0.31		c0.06	0.00				
v/s Ratio Perm			0.08									
v/c Ratio	0.22	0.45	0.12	0.50	0.42		0.51	0.04				
Uniform Delay, d1	58.0	7.8	5.8	54.9	5.9		49.7	47.0				
Progression Factor	1.00	1.00	1.00	1.26	0.27		1.00	1.00				
Incremental Delay, d2	0.6	0.4	0.2	1.3	0.3		0.9	0.0				
Delay (s)	58.7	8.2	6.1	70.4	1.9		50.6	47.0				
Level of Service	E	A	A	E	A		D	D				
Approach Delay (s)		8.4			4.0			49.2			0.0	
Approach LOS		A			A			D			A	

Intersection Summary			
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	50.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1529	88	65	1337	242	71
Future Volume (vph)	1529	88	65	1337	242	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	4.5	5.5	4.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	5255	1636	1829	5255	3473	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	5255	1636	1829	5255	3473	
Peak-hour factor, PHF	0.94	0.94	0.93	0.93	0.89	0.89
Adj. Flow (vph)	1627	94	70	1438	272	80
RTOR Reduction (vph)	0	33	0	0	28	0
Lane Group Flow (vph)	1627	61	70	1438	324	0
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	76.0	76.0	7.9	88.4	21.6	
Effective Green, g (s)	76.0	76.0	7.9	88.4	21.6	
Actuated g/C Ratio	0.63	0.63	0.07	0.74	0.18	
Clearance Time (s)	5.5	5.5	4.5	5.5	4.5	
Vehicle Extension (s)	4.5	4.5	2.0	4.5	2.0	
Lane Grp Cap (vph)	3328	1036	120	3871	625	
v/s Ratio Prot	c0.31		c0.04	0.27	c0.09	
v/s Ratio Perm		0.04				
v/c Ratio	0.49	0.06	0.58	0.37	0.52	
Uniform Delay, d1	11.7	8.4	54.5	5.7	44.5	
Progression Factor	0.47	0.64	0.75	1.62	1.00	
Incremental Delay, d2	0.5	0.1	4.1	0.2	0.3	
Delay (s)	6.0	5.5	44.8	9.5	44.8	
Level of Service	A	A	D	A	D	
Approach Delay (s)	5.9			11.2	44.8	
Approach LOS	A			B	D	

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	54.4%	ICU Level of Service	A
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 (vph)	263	1274	56	22	969	21	70	81	74	31	42	377
Future Volume (vph)	263	1274	56	22	969	21	70	81	74	31	42	377
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5	5.5	4.5	5.5	5.5	4.5	5.0	5.0	4.5	5.0	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	0.85	1.00	0.86	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1829	5255	1636	3547	5255	1636	3547	1805	1554	1829	1665	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1829	5255	1636	3547	5255	1636	3547	1805	1554	1829	1665	
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.92	0.85	0.85	0.85	0.91	0.91	0.91
Adj. Flow (vph)	277	1341	59	24	1053	23	82	95	87	34	46	414
RTOR Reduction (vph)	0	0	24	0	0	13	0	3	65	0	336	0
Lane Group Flow (vph)	277	1341	35	24	1053	10	82	101	13	34	124	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	24.3	71.7	71.7	4.5	51.9	51.9	5.7	20.0	20.0	4.3	18.6	
Effective Green, g (s)	24.3	71.7	71.7	4.5	51.9	51.9	5.7	20.0	20.0	4.3	18.6	
Actuated g/C Ratio	0.20	0.60	0.60	0.04	0.43	0.43	0.05	0.17	0.17	0.04	0.16	
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5	5.5	4.5	5.0	5.0	4.5	5.0	
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5	4.5	2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	370	3139	977	133	2272	707	168	300	259	65	258	
v/s Ratio Prot	c0.15	0.26		0.01	c0.20		c0.02	0.06		0.02	c0.07	
v/s Ratio Perm			0.02			0.01			0.01			
v/c Ratio	0.75	0.43	0.04	0.18	0.46	0.01	0.49	0.34	0.05	0.52	0.48	
Uniform Delay, d1	45.0	13.1	9.9	56.0	24.2	19.4	55.7	44.1	42.0	56.8	46.3	
Progression Factor	0.67	0.89	13.68	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.4	0.4	0.1	0.2	0.7	0.0	0.8	0.9	0.1	3.5	1.9	
Delay (s)	36.4	11.9	135.9	56.2	24.9	19.5	56.5	45.0	42.1	60.3	48.2	
Level of Service	D	B	F	E	C	B	E	D	D	E	D	
Approach Delay (s)		20.3			25.4			47.8			49.0	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	28.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	147	1	289	79	3	298
Future Volume (vph)	147	1	289	79	3	298
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.1	3.0	3.1		3.0
Lane Util. Factor	1.00	1.00	1.00	1.00		1.00
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		1.00
Satd. Flow (prot)	1829	1636	1925	1636		1924
Flt Permitted	0.95	1.00	1.00	1.00		1.00
Satd. Flow (perm)	1829	1636	1925	1636		1920
Peak-hour factor, PHF	0.82	0.82	0.93	0.93	0.85	0.85
Adj. Flow (vph)	179	1	311	85	4	351
RTOR Reduction (vph)	0	1	0	21	0	0
Lane Group Flow (vph)	179	0	311	64	0	355
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	13.0	13.0	58.8	58.8		58.8
Effective Green, g (s)	14.1	14.0	59.9	59.8		59.9
Actuated g/C Ratio	0.18	0.18	0.75	0.75		0.75
Clearance Time (s)	4.1	4.1	4.1	4.1		4.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	322	286	1441	1222		1437
v/s Ratio Prot	c0.10		0.16			
v/s Ratio Perm		0.00		0.04		c0.18
v/c Ratio	0.56	0.00	0.22	0.05		0.25
Uniform Delay, d1	30.1	27.2	3.0	2.7		3.1
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	2.1	0.0	0.3	0.1		0.4
Delay (s)	32.2	27.2	3.4	2.7		3.5
Level of Service	C	C	A	A		A
Approach Delay (s)	32.1		3.2			3.5
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	33.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	274	16	88	192	13	322
Future Volume (vph)	274	16	88	192	13	322
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.1	3.0	3.4	3.0	3.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3657	1636	1829	3657	1829	1636
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3657	1636	1829	3657	1829	1636
Peak-hour factor, PHF	0.97	0.97	0.91	0.91	0.85	0.85
Adj. Flow (vph)	282	16	97	211	15	379
RTOR Reduction (vph)	0	10	0	0	0	284
Lane Group Flow (vph)	282	6	97	211	15	95
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	15.1	15.1	5.0	23.8	9.4	9.4
Effective Green, g (s)	16.2	16.1	6.1	24.9	10.5	10.5
Actuated g/C Ratio	0.39	0.39	0.15	0.60	0.25	0.25
Clearance Time (s)	4.1	4.1	4.1	4.5	4.1	4.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1417	630	266	2178	459	410
v/s Ratio Prot	c0.08		c0.05	0.06	0.01	
v/s Ratio Perm		0.00				c0.06
v/c Ratio	0.20	0.01	0.36	0.10	0.03	0.23
Uniform Delay, d1	8.5	7.9	16.1	3.6	11.8	12.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.0	0.9	0.0	0.0	0.3
Delay (s)	8.6	7.9	17.0	3.6	11.8	12.7
Level of Service	A	A	B	A	B	B
Approach Delay (s)	8.5			7.8	12.7	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	41.8	Sum of lost time (s)	9.0
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
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 (vph)	94	925	166	181	507	20	186	518	418	83	565	88
Future Volume (vph)	94	925	166	181	507	20	186	518	418	83	565	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0	5.0	4.5	6.0		5.0	6.0	6.0	4.5	5.5	5.5
Lane Util. Factor	0.97	0.91	0.88	0.97	0.91		0.94	0.95	0.88	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	2837	3547	5221		5157	3657	2793	3547	5255	1609
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	2837	3547	5221		5157	3657	2793	3547	5255	1609
Peak-hour factor, PHF	0.91	0.91	0.91	0.86	0.86	0.86	0.93	0.93	0.93	0.91	0.91	0.91
Adj. Flow (vph)	103	1016	182	210	590	23	200	557	449	91	621	97
RTOR Reduction (vph)	0	0	42	0	2	0	0	0	359	0	0	80
Lane Group Flow (vph)	103	1016	140	210	611	0	200	557	90	91	621	17
Confl. Peds. (#/hr)			5			9			13			4
Confl. Bikes (#/hr)			1			1			1			
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	8.3	67.0	79.0	12.3	71.0		12.0	27.4	27.4	8.8	24.2	24.2
Effective Green, g (s)	8.3	67.0	79.0	12.3	71.0		12.0	27.4	27.4	8.8	24.2	24.2
Actuated g/C Ratio	0.06	0.49	0.58	0.09	0.52		0.09	0.20	0.20	0.06	0.18	0.18
Clearance Time (s)	4.5	6.0	5.0	4.5	6.0		5.0	6.0	6.0	4.5	5.5	5.5
Vehicle Extension (s)	2.0	3.5	2.0	2.0	3.5		2.0	3.5	3.5	2.0	3.5	3.5
Lane Grp Cap (vph)	215	2579	1641	319	2715		453	734	560	228	931	285
v/s Ratio Prot	0.03	c0.19	0.01	c0.06	c0.12		c0.04	c0.15		0.03	0.12	
v/s Ratio Perm			0.04						0.03			0.01
v/c Ratio	0.48	0.39	0.09	0.66	0.22		0.44	0.76	0.16	0.40	0.67	0.06
Uniform Delay, d1	62.0	21.9	12.7	60.1	17.8		59.1	51.4	45.1	61.3	52.4	46.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.5	0.0	3.7	0.2		0.3	4.7	0.2	0.4	1.9	0.1
Delay (s)	62.6	22.4	12.7	63.8	18.0		59.3	56.1	45.2	61.7	54.3	46.8
Level of Service	E	C	B	E	B		E	E	D	E	D	D
Approach Delay (s)		24.2			29.7			52.6			54.2	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	39.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	136.5	Sum of lost time (s)	21.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
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 (vph)	31	32	357	253	53	25	408	1217	445	64	875	21
Future Volume (vph)	31	32	357	253	53	25	408	1217	445	64	875	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.1	4.1	4.1		4.1	4.1	4.1	4.1	4.1	
Lane Util. Factor	1.00	0.91	0.91	0.97	1.00		0.97	0.91	1.00	0.97	0.86	
Frt	1.00	0.89	0.85	1.00	0.95		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1829	1553	2978	3547	1832		3547	5255	1636	3547	6598	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1829	1553	2978	3547	1832		3547	5255	1636	3547	6598	
Peak-hour factor, PHF	0.82	0.82	0.82	0.93	0.93	0.93	0.95	0.95	0.95	0.84	0.84	0.84
Adj. Flow (vph)	38	39	435	272	57	27	429	1281	468	76	1042	25
RTOR Reduction (vph)	0	88	225	0	16	0	0	0	214	0	2	0
Lane Group Flow (vph)	38	73	88	272	68	0	429	1281	254	76	1065	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	6.4	36.6	36.6	8.0	38.2		19.5	62.5	70.5	6.5	49.5	
Effective Green, g (s)	6.4	36.6	36.6	8.0	38.2		19.5	62.5	70.5	6.5	49.5	
Actuated g/C Ratio	0.05	0.28	0.28	0.06	0.29		0.15	0.48	0.54	0.05	0.38	
Clearance Time (s)	4.1	4.1	4.1	4.1	4.1		4.1	4.1	4.1	4.1	4.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	90	437	838	218	538		532	2526	938	177	2512	
v/s Ratio Prot	0.02	c0.05		c0.08	0.04		c0.12	c0.24	0.02	0.02	0.16	
v/s Ratio Perm			0.03						0.14			
v/c Ratio	0.42	0.17	0.11	1.25	0.13		0.81	0.51	0.27	0.43	0.42	
Uniform Delay, d1	60.0	35.2	34.6	61.0	33.7		53.4	23.2	16.0	59.9	29.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.2	0.2	0.1	143.7	0.1		8.7	0.7	0.2	1.7	0.5	
Delay (s)	63.2	35.4	34.6	204.7	33.8		62.1	23.9	16.1	61.6	30.2	
Level of Service	E	D	C	F	C		E	C	B	E	C	
Approach Delay (s)		37.0			164.4			29.8			32.3	
Approach LOS		D			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	42.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	54.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	180	223	1446	0	0	686
Future Volume (vph)	180	223	1446	0	0	686
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.5	1.5	2.0			2.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frpb, ped/bikes	1.00	1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	5255			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	5255			5255
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.95	0.95
Adj. Flow (vph)	198	245	1589	0	0	722
RTOR Reduction (vph)	0	70	0	0	0	0
Lane Group Flow (vph)	198	175	1589	0	0	722
Confl. Peds. (#/hr)				9		
Confl. Bikes (#/hr)				1		
Turn Type	Prot	Prot	NA			NA
Protected Phases	8	8	2			6
Permitted Phases						
Actuated Green, G (s)	7.1	7.1	22.4			22.4
Effective Green, g (s)	10.1	10.1	25.4			25.4
Actuated g/C Ratio	0.26	0.26	0.65			0.65
Clearance Time (s)	4.5	4.5	5.0			5.0
Vehicle Extension (s)	2.0	2.0	3.5			3.5
Lane Grp Cap (vph)	918	745	3422			3422
v/s Ratio Prot	0.06	c0.06	c0.30			0.14
v/s Ratio Perm						
v/c Ratio	0.22	0.23	0.46			0.21
Uniform Delay, d1	11.3	11.4	3.4			2.7
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.0	0.1	0.1			0.0
Delay (s)	11.4	11.5	3.5			2.8
Level of Service	B	B	A			A
Approach Delay (s)	11.4		3.5			2.8
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	4.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	39.0	Sum of lost time (s)	3.5
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: Hacienda Dr. & I-580 EB Off Ramp

7/22/2016

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	776	392	0	1390	582	0
Future Volume (vph)	776	392	0	1390	582	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.5	1.5		2.0	2.1	
Lane Util. Factor	0.97	0.88		0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3547	2880		5255	5255	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3547	2880		5255	5255	
Peak-hour factor, PHF	0.91	0.91	0.87	0.87	0.95	0.95
Adj. Flow (vph)	853	431	0	1598	613	0
RTOR Reduction (vph)	0	249	0	0	0	0
Lane Group Flow (vph)	853	182	0	1598	613	0
Confl. Peds. (#/hr)			8			
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases	4					
Actuated Green, G (s)	17.9	17.9		25.0	25.0	
Effective Green, g (s)	20.9	20.9		28.0	27.9	
Actuated g/C Ratio	0.40	0.40		0.53	0.53	
Clearance Time (s)	4.5	4.5		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		3.5	3.5	
Lane Grp Cap (vph)	1414	1148		2808	2797	
v/s Ratio Prot	c0.24	0.06		c0.30	0.12	
v/s Ratio Perm						
v/c Ratio	0.60	0.16		0.57	0.22	
Uniform Delay, d1	12.5	10.1		8.2	6.5	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.0		0.3	0.0	
Delay (s)	13.0	10.1		8.5	6.5	
Level of Service	B	B		A	A	
Approach Delay (s)	12.0			8.5	6.5	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	52.4	Sum of lost time (s)	3.6
Intersection Capacity Utilization	77.1%	ICU Level of Service	D
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 (vph)	101	1302	125	85	514	36	125	31	109	25	24	63
Future Volume (vph)	101	1302	125	85	514	36	125	31	109	25	24	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1829	5255	1636	3547	5203		1829	1925	1636	1829	1925	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1829	5255	1636	3547	5203		1829	1925	1636	1829	1925	1636
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	112	1447	139	94	571	40	139	34	121	28	27	70
RTOR Reduction (vph)	0	0	55	0	4	0	0	0	96	0	0	60
Lane Group Flow (vph)	112	1447	84	94	607	0	139	34	25	28	27	10
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	13.2	72.1	72.1	8.8	67.7		13.9	26.9	26.9	4.7	17.7	17.7
Effective Green, g (s)	13.2	72.1	72.1	8.8	67.7		13.9	26.9	26.9	4.7	17.7	17.7
Actuated g/C Ratio	0.10	0.55	0.55	0.07	0.52		0.11	0.21	0.21	0.04	0.14	0.14
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	185	2914	907	240	2709		195	398	338	66	262	222
v/s Ratio Prot	c0.06	c0.28		0.03	0.12		c0.08	0.02		0.02	c0.01	
v/s Ratio Perm			0.05						0.02			0.01
v/c Ratio	0.61	0.50	0.09	0.39	0.22		0.71	0.09	0.07	0.42	0.10	0.04
Uniform Delay, d1	55.9	17.8	13.6	58.0	16.9		56.1	41.6	41.5	61.3	49.2	48.8
Progression Factor	1.00	1.00	1.00	1.18	0.74		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.5	0.6	0.2	1.0	0.2		11.6	0.1	0.1	4.3	0.2	0.1
Delay (s)	61.4	18.4	13.8	69.5	12.6		67.8	41.7	41.6	65.7	49.4	48.9
Level of Service	E	B	B	E	B		E	D	D	E	D	D
Approach Delay (s)		20.9			20.2			54.0			52.7	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	25.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
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 (vph)	26	1287	132	202	484	13	144	5	179	6	0	12
Future Volume (vph)	26	1287	132	202	484	13	144	5	179	6	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.91		0.97	0.91			1.00	1.00		1.00	
Frt	1.00	0.99		1.00	1.00			1.00	0.85		0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.98	
Satd. Flow (prot)	1829	5181		3547	5235			1836	1636		1726	
Flt Permitted	0.95	1.00		0.95	1.00			0.72	1.00		0.92	
Satd. Flow (perm)	1829	5181		3547	5235			1384	1636		1612	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	1430	147	224	538	14	160	6	199	7	0	13
RTOR Reduction (vph)	0	7	0	0	1	0	0	0	151	0	16	0
Lane Group Flow (vph)	29	1570	0	224	551	0	0	166	48	0	4	0
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	5.2	75.5		13.5	83.8			27.5	27.5		27.5	
Effective Green, g (s)	5.2	75.5		13.5	83.8			27.5	27.5		27.5	
Actuated g/C Ratio	0.04	0.58		0.10	0.64			0.21	0.21		0.21	
Clearance Time (s)	4.0	5.5		4.0	5.5			4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	73	3008		368	3374			292	346		341	
v/s Ratio Prot	0.02	c0.30		c0.06	0.11							
v/s Ratio Perm								c0.12	0.03		0.00	
v/c Ratio	0.40	0.52		0.61	0.16			0.57	0.14		0.01	
Uniform Delay, d1	60.9	16.4		55.7	9.2			45.9	41.6		40.5	
Progression Factor	1.36	0.18		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	3.2	0.6		2.8	0.1			2.5	0.2		0.0	
Delay (s)	85.8	3.6		58.6	9.3			48.5	41.8		40.5	
Level of Service	F	A		E	A			D	D		D	
Approach Delay (s)		5.1			23.5			44.8			40.5	
Approach LOS		A			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	59.7%	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												
Traffic Volume (vph)	223	808	535	241	269	34	404	604	482	78	534	114
Future Volume (vph)	223	808	535	241	269	34	404	604	482	78	534	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	5.0	5.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	0.97	0.95	0.88	0.94	0.95		0.94	0.95	1.00	0.97	0.86	0.88
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	2880	5157	3596		5157	3657	1636	3547	6621	2880
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	2880	5157	3596		5157	3657	1636	3547	6621	2880
Peak-hour factor, PHF	0.90	0.90	0.90	0.97	0.97	0.97	0.91	0.91	0.91	0.97	0.97	0.97
Adj. Flow (vph)	248	898	594	248	277	35	444	664	530	80	551	118
RTOR Reduction (vph)	0	0	116	0	6	0	0	0	262	0	0	89
Lane Group Flow (vph)	248	898	478	248	306	0	444	664	268	80	551	29
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	16.7	35.7	53.1	16.3	35.3		17.4	31.9	31.9	15.2	29.7	29.7
Effective Green, g (s)	16.7	35.7	53.1	16.3	35.3		17.4	31.9	31.9	15.2	29.7	29.7
Actuated g/C Ratio	0.14	0.29	0.44	0.13	0.29		0.14	0.26	0.26	0.13	0.25	0.25
Clearance Time (s)	5.0	6.0	5.0	5.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	2.0	3.0	2.0	2.0	3.0		2.0	4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)	489	1078	1262	694	1048		740	963	430	445	1623	706
v/s Ratio Prot	c0.07	c0.25	0.05	0.05	0.09		c0.09	c0.18		0.02	0.08	
v/s Ratio Perm			0.11						0.16			0.01
v/c Ratio	0.51	0.83	0.38	0.36	0.29		0.60	0.69	0.62	0.18	0.34	0.04
Uniform Delay, d1	48.4	39.9	22.9	47.6	33.2		48.6	40.1	39.3	47.4	37.6	34.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	5.6	0.1	0.1	0.2		0.9	2.3	3.2	0.1	0.2	0.0
Delay (s)	48.7	45.6	23.0	47.8	33.4		49.5	42.4	42.5	47.4	37.8	34.9
Level of Service	D	D	C	D	C		D	D	D	D	D	C
Approach Delay (s)		38.3			39.7			44.3			38.4	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	40.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	121.1	Sum of lost time (s)	22.0
Intersection Capacity Utilization	83.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	500	225	1398	0	0	1124
Future Volume (vph)	500	225	1398	0	0	1124
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.5	2.5	2.0			2.0
Lane Util. Factor	0.97	0.88	0.95			0.91
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	3657			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	3657			5255
Peak-hour factor, PHF	0.84	0.84	0.91	0.91	0.94	0.94
Adj. Flow (vph)	595	268	1536	0	0	1196
RTOR Reduction (vph)	0	52	0	0	0	0
Lane Group Flow (vph)	595	216	1536	0	0	1196
Turn Type	Prot	Prot	NA			NA
Protected Phases	8	8	2			6
Permitted Phases	8					
Actuated Green, G (s)	12.6	12.6	28.3			28.3
Effective Green, g (s)	14.6	14.6	31.3			31.3
Actuated g/C Ratio	0.29	0.29	0.62			0.62
Clearance Time (s)	4.5	4.5	5.0			5.0
Vehicle Extension (s)	2.0	2.0	3.5			3.5
Lane Grp Cap (vph)	1027	834	2271			3263
v/s Ratio Prot	c0.17	0.08	c0.42			0.23
v/s Ratio Perm						
v/c Ratio	0.58	0.26	0.68			0.37
Uniform Delay, d1	15.3	13.7	6.2			4.7
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.5	0.1	0.8			0.1
Delay (s)	15.8	13.8	7.1			4.8
Level of Service	B	B	A			A
Approach Delay (s)	15.2		7.1			4.8
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	50.4	Sum of lost time (s)	4.5
Intersection Capacity Utilization	86.5%	ICU Level of Service	E
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 (vph)	526	237	320	166	0	475	0	1670	104	285	951	0
Future Volume (vph)	526	237	320	166	0	475	0	1670	104	285	951	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5		4.5		5.0	5.0	4.5	5.0	
Lane Util. Factor	0.97	1.00	1.00	0.97		0.88		0.91	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3547	1925	1636	3547		2880		5255	1636	1829	3657	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3547	1925	1636	3547		2880		5255	1636	1829	3657	
Peak-hour factor, PHF	0.79	0.79	0.79	0.81	0.81	0.81	0.90	0.90	0.90	0.91	0.91	0.91
Adj. Flow (vph)	666	300	405	205	0	586	0	1856	116	313	1045	0
RTOR Reduction (vph)	0	0	77	0	0	0	0	0	65	0	0	0
Lane Group Flow (vph)	666	300	328	205	0	586	0	1856	51	313	1045	0
Turn Type	Split	NA	Perm	Prot		pt+ov		NA	Perm	Prot	NA	
Protected Phases	4	4		8		1 8		2		1	6	
Permitted Phases			4	8					2			
Actuated Green, G (s)	27.2	27.2	27.2	8.5		32.6		37.1	37.1	19.6	61.2	
Effective Green, g (s)	27.2	27.2	27.2	8.5		32.6		37.1	37.1	19.6	61.2	
Actuated g/C Ratio	0.25	0.25	0.25	0.08		0.29		0.33	0.33	0.18	0.55	
Clearance Time (s)	4.5	4.5	4.5	4.5				5.0	5.0	4.5	5.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0				3.5	3.5	2.0	3.5	
Lane Grp Cap (vph)	869	472	401	271		846		1757	547	323	2018	
v/s Ratio Prot	0.19	0.16		0.06		c0.20		c0.35		c0.17	0.29	
v/s Ratio Perm			c0.20						0.03			
v/c Ratio	0.77	0.64	0.82	0.76		0.69		1.06	0.09	0.97	0.52	
Uniform Delay, d1	38.9	37.4	39.5	50.2		34.7		36.9	25.4	45.3	15.6	
Progression Factor	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.7	2.1	11.6	10.2		2.0		38.1	0.1	41.0	0.3	
Delay (s)	42.6	39.5	51.1	60.4		36.7		75.0	25.4	86.4	15.9	
Level of Service	D	D	D	E		D		E	C	F	B	
Approach Delay (s)		44.4			42.8			72.1			32.1	
Approach LOS		D			D			E			C	

Intersection Summary			
HCM 2000 Control Delay	51.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	110.9	Sum of lost time (s)	18.5
Intersection Capacity Utilization	82.6%	ICU Level of Service	E
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 (vph)	16	161	0	39	186	7	0	262	310	34	16	30
Future Volume (vph)	16	161	0	39	186	7	0	262	310	34	16	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1		4.1	4.1	4.1		4.1	4.1	4.1	4.1	
Lane Util. Factor	1.00	1.00		0.97	0.95	1.00		0.91	0.91	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98		1.00	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.95	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1829	1925		3547	3657	1608		3312	1470	1829	3273	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1829	1925		3547	3657	1608		3312	1470	1829	3273	
Peak-hour factor, PHF	0.58	0.58	0.58	0.87	0.87	0.87	0.62	0.62	0.62	0.73	0.73	0.73
Adj. Flow (vph)	28	278	0	45	214	8	0	423	500	47	22	41
RTOR Reduction (vph)	0	0	0	0	0	6	0	45	132	0	15	0
Lane Group Flow (vph)	28	278	0	45	214	2	0	593	153	47	48	0
Confl. Peds. (#/hr)			2			5			1			1
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	4.1	20.8		4.1	20.8	20.8		53.6	53.6	5.1	62.8	
Effective Green, g (s)	4.1	20.8		4.1	20.8	20.8		53.6	53.6	5.1	62.8	
Actuated g/C Ratio	0.04	0.21		0.04	0.21	0.21		0.54	0.54	0.05	0.63	
Clearance Time (s)	4.1	4.1		4.1	4.1	4.1		4.1	4.1	4.1	4.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	74	400		145	760	334		1775	787	93	2055	
v/s Ratio Prot	c0.02	c0.14		0.01	0.06			c0.18		c0.03	0.01	
v/s Ratio Perm						0.00			0.10			
v/c Ratio	0.38	0.69		0.31	0.28	0.00		0.33	0.19	0.51	0.02	
Uniform Delay, d1	46.7	36.7		46.6	33.3	31.4		13.1	12.0	46.2	7.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.2	5.2		1.2	0.2	0.0		0.5	0.6	4.3	0.0	
Delay (s)	49.9	41.8		47.8	33.5	31.4		13.6	12.6	50.5	7.0	
Level of Service	D	D		D	C	C		B	B	D	A	
Approach Delay (s)		42.6			35.9			13.3			25.6	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	23.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
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		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	30	27	0	61	25	30	1	242	105	45	88	18
Future Volume (vph)	30	27	0	61	25	30	1	242	105	45	88	18
Peak Hour Factor	0.25	0.25	0.25	0.92	0.92	0.92	0.74	0.74	0.74	0.83	0.83	0.83
Hourly flow rate (vph)	120	108	0	66	27	33	1	327	142	54	106	22

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total (vph)	228	93	33	165	306	182
Volume Left (vph)	120	66	0	1	0	54
Volume Right (vph)	0	0	33	0	142	22
Hadj (s)	0.14	0.18	-0.57	0.04	-0.29	0.02
Departure Headway (s)	5.8	6.2	3.2	5.8	5.5	5.7
Degree Utilization, x	0.37	0.16	0.03	0.26	0.46	0.29
Capacity (veh/h)	573	519	1121	599	637	590
Control Delay (s)	12.2	10.3	6.3	9.7	11.9	10.9
Approach Delay (s)	12.2	9.3		11.1		10.9
Approach LOS	B	A		B		B

Intersection Summary			
Delay	11.1		
Level of Service	B		
Intersection Capacity Utilization	41.9%	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)	712	628	48	148	258	781	14	679	159	572	271	192
Future Volume (vph)	712	628	48	148	258	781	14	679	159	572	271	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	1636	3547	5255	1636	3547	5255	1636	3547	5255	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	1636	3547	5255	1636	3547	5255	1636	3547	5255	1636
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.87	0.92	0.93
Adj. Flow (vph)	838	739	56	174	304	919	16	799	187	657	295	206
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	838	739	56	174	304	919	16	799	187	657	295	206
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			Free			Free			Free			Free
Actuated Green, G (s)	27.5	33.1	104.7	10.3	15.9	104.7	2.3	24.0	104.7	17.3	39.0	104.7
Effective Green, g (s)	28.5	36.1	104.7	11.3	18.9	104.7	3.3	27.0	104.7	18.3	42.0	104.7
Actuated g/C Ratio	0.27	0.34	1.00	0.11	0.18	1.00	0.03	0.26	1.00	0.17	0.40	1.00
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	965	1811	1636	382	948	1636	111	1355	1636	619	2108	1636
v/s Ratio Prot	c0.24	0.14		0.05	0.06		0.00	0.15		c0.19	0.06	
v/s Ratio Perm			0.03			c0.56			0.11			0.13
v/c Ratio	0.87	0.41	0.03	0.46	0.32	0.56	0.14	0.59	0.11	1.06	0.14	0.13
Uniform Delay, d1	36.3	26.2	0.0	43.8	37.3	0.0	49.3	34.0	0.0	43.2	19.9	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.4	0.2	0.0	0.9	0.2	1.4	0.6	0.7	0.1	53.6	0.0	0.2
Delay (s)	44.7	26.3	0.0	44.7	37.5	1.4	49.9	34.7	0.1	96.8	19.9	0.2
Level of Service	D	C	A	D	D	A	D	C	A	F	B	A
Approach Delay (s)		34.8			14.6			28.5			60.0	
Approach LOS		C			B			C			E	

Intersection Summary			
HCM 2000 Control Delay	33.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	104.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Appendix C – Existing with Project Conditions Level of Service Analysis Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	0	52	49	1	15	14	1079	13	6	2006	5
Future Volume (vph)	13	0	52	49	1	15	14	1079	13	6	2006	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5		4.0	4.0		3.5	5.0	5.0	3.5	5.0	5.0
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.89		1.00	0.86		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1700		1829	1651		1829	3657	1636	1829	3657	1636
Flt Permitted		0.94		0.48	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1621		930	1651		1829	3657	1636	1829	3657	1636
Peak-hour factor, PHF	0.63	0.63	0.63	0.77	0.77	0.77	0.93	0.93	0.93	0.96	0.96	0.96
Adj. Flow (vph)	21	0	83	64	1	19	15	1160	14	6	2090	5
RTOR Reduction (vph)	0	73	0	0	17	0	0	0	3	0	0	1
Lane Group Flow (vph)	0	31	0	64	3	0	15	1160	11	6	2090	4
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)		15.1		14.6	14.6		2.7	101.7	101.7	1.2	100.2	100.2
Effective Green, g (s)		15.1		14.6	14.6		2.7	101.7	101.7	1.2	100.2	100.2
Actuated g/C Ratio		0.12		0.11	0.11		0.02	0.78	0.78	0.01	0.77	0.77
Clearance Time (s)		3.5		4.0	4.0		3.5	5.0	5.0	3.5	5.0	5.0
Vehicle Extension (s)		2.0		2.0	2.0		2.0	4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)		188		104	185		37	2860	1279	16	2818	1260
v/s Ratio Prot					0.00		c0.01	0.32		0.00	c0.57	
v/s Ratio Perm		0.02		c0.07					0.01			0.00
v/c Ratio		0.16		0.62	0.02		0.41	0.41	0.01	0.38	0.74	0.00
Uniform Delay, d1		51.8		55.0	51.3		62.9	4.5	3.1	64.0	8.0	3.4
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.1		7.4	0.0		2.6	0.4	0.0	5.3	1.8	0.0
Delay (s)		51.9		62.4	51.3		65.5	4.9	3.1	69.3	9.8	3.4
Level of Service		D		E	D		E	A	A	E	A	A
Approach Delay (s)		51.9			59.8			5.7			9.9	
Approach LOS		D			E			A			A	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
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 (vph)	43	245	369	257	615	369	568	908	332	469	1517	71
Future Volume (vph)	43	245	369	257	615	369	568	908	332	469	1517	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	5.0	5.0	5.5	5.5	5.0	5.5	5.5	5.0	5.5	
Lane Util. Factor	0.97	0.91	0.88	0.94	0.91	1.00	0.94	0.91	0.88	0.97	0.86	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3547	5255	2880	5157	5255	1636	5157	5255	2880	3547	6577	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3547	5255	2880	5157	5255	1636	5157	5255	2880	3547	6577	
Peak-hour factor, PHF	0.95	0.95	0.95	0.91	0.91	0.91	0.95	0.95	0.95	0.96	0.96	0.96
Adj. Flow (vph)	45	258	388	282	676	405	598	956	349	489	1580	74
RTOR Reduction (vph)	0	0	55	0	0	269	0	0	240	0	4	0
Lane Group Flow (vph)	45	258	333	282	676	136	598	956	109	489	1650	0
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	4.9	17.8	37.3	15.3	28.7	28.7	19.5	34.5	34.5	21.2	36.2	
Effective Green, g (s)	4.9	17.8	37.3	15.3	28.7	28.7	19.5	34.5	34.5	21.2	36.2	
Actuated g/C Ratio	0.04	0.16	0.34	0.14	0.26	0.26	0.18	0.31	0.31	0.19	0.33	
Clearance Time (s)	5.0	6.0	5.0	5.0	5.5	5.5	5.0	5.5	5.5	5.0	5.5	
Vehicle Extension (s)	2.0	4.5	2.0	2.0	4.5	4.5	2.0	4.5	4.5	2.0	4.5	
Lane Grp Cap (vph)	157	848	973	715	1367	425	911	1643	900	681	2158	
v/s Ratio Prot	0.01	0.05	0.06	c0.05	c0.13		0.12	0.18		c0.14	c0.25	
v/s Ratio Perm			0.06			0.08			0.04			
v/c Ratio	0.29	0.30	0.34	0.39	0.49	0.32	0.66	0.58	0.12	0.72	0.76	
Uniform Delay, d1	51.0	40.8	27.3	43.3	34.6	32.9	42.3	31.8	27.1	41.7	33.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.4	0.1	0.1	0.5	0.8	1.3	0.7	0.1	3.0	1.9	
Delay (s)	51.4	41.1	27.4	43.4	35.1	33.7	43.6	32.6	27.2	44.8	35.1	
Level of Service	D	D	C	D	D	C	D	C	C	D	D	
Approach Delay (s)		34.1			36.4			35.0			37.3	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	36.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	110.3	Sum of lost time (s)	21.5
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	395	708	1109	0	0	1607
Future Volume (vph)	395	708	1109	0	0	1607
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0			3.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	5255			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	5255			5255
Peak-hour factor, PHF	0.95	0.95	0.91	0.91	0.96	0.96
Adj. Flow (vph)	416	745	1219	0	0	1674
RTOR Reduction (vph)	0	57	0	0	0	0
Lane Group Flow (vph)	416	688	1219	0	0	1674
Turn Type	Prot	Prot	NA			NA
Protected Phases	4	4	2			6
Permitted Phases	4					
Actuated Green, G (s)	18.4	18.4	29.6			29.6
Effective Green, g (s)	21.4	21.4	32.6			32.6
Actuated g/C Ratio	0.36	0.36	0.54			0.54
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	5.0	5.0	5.0			1.8
Lane Grp Cap (vph)	1265	1027	2855			2855
v/s Ratio Prot	0.12	c0.24	0.23			c0.32
v/s Ratio Perm						
v/c Ratio	0.33	0.67	0.43			0.59
Uniform Delay, d1	14.1	16.3	8.1			9.2
Progression Factor	1.00	1.00	1.16			1.00
Incremental Delay, d2	0.3	2.2	0.4			0.9
Delay (s)	14.4	18.5	9.9			10.1
Level of Service	B	B	A			B
Approach Delay (s)	17.0		9.9			10.1
Approach LOS	B		A			B

Intersection Summary			
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	609	1686	0	892	1426	0
Future Volume (vph)	609	1686	0	892	1426	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	
Lane Util. Factor	0.97	0.88		0.91	0.91	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3547	2880		5255	5255	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3547	2880		5255	5255	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	655	1813	0	959	1533	0
RTOR Reduction (vph)	0	3	0	0	0	0
Lane Group Flow (vph)	655	1810	0	959	1533	0
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases	4			2		
Actuated Green, G (s)	29.0	29.0		19.0	19.0	
Effective Green, g (s)	32.0	32.0		22.0	22.0	
Actuated g/C Ratio	0.53	0.53		0.37	0.37	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	1.8	1.8		5.0	5.0	
Lane Grp Cap (vph)	1891	1536		1926	1926	
v/s Ratio Prot	0.18	c0.63		0.18	c0.29	
v/s Ratio Perm						
v/c Ratio	0.35	1.18		0.50	0.80	
Uniform Delay, d1	8.0	14.0		14.7	17.0	
Progression Factor	1.00	1.00		1.00	0.74	
Incremental Delay, d2	0.0	87.4		0.9	3.0	
Delay (s)	8.1	101.4		15.6	15.6	
Level of Service	A	F		B	B	
Approach Delay (s)	76.7			15.6	15.6	
Approach LOS	E			B	B	

Intersection Summary			
HCM 2000 Control Delay	46.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	93.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	6	839	138	36	1173	66	30
Future Volume (vph)	6	839	138	36	1173	66	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1829	5255	1636	1829	5255	1829	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1829	5255	1636	1829	5255	1829	1636
Peak-hour factor, PHF	0.93	0.93	0.93	0.92	0.92	0.92	0.92
Adj. Flow (vph)	6	902	148	39	1275	72	33
RTOR Reduction (vph)	0	0	39	0	0	0	30
Lane Group Flow (vph)	6	902	109	39	1275	72	3
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm
Protected Phases	5	2		1	6		
Permitted Phases			2			8	8
Actuated Green, G (s)	1.2	95.5	95.5	6.3	100.6	12.7	12.7
Effective Green, g (s)	1.2	95.5	95.5	6.3	100.6	12.7	12.7
Actuated g/C Ratio	0.01	0.73	0.73	0.05	0.77	0.10	0.10
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0	5.0	5.0
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5	2.0	2.0
Lane Grp Cap (vph)	16	3860	1201	88	4066	178	159
v/s Ratio Prot	0.00	0.17		c0.02	c0.24		
v/s Ratio Perm			0.07			c0.04	0.00
v/c Ratio	0.38	0.23	0.09	0.44	0.31	0.40	0.02
Uniform Delay, d1	64.0	5.5	4.9	60.1	4.4	55.1	53.0
Progression Factor	1.00	1.00	1.00	0.80	1.85	1.00	1.00
Incremental Delay, d2	5.3	0.1	0.1	1.2	0.2	0.5	0.0
Delay (s)	69.3	5.7	5.1	49.6	8.3	55.6	53.0
Level of Service	E	A	A	D	A	E	D
Approach Delay (s)		5.9			9.5	54.8	
Approach LOS		A			A	D	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	43.9%	ICU Level of Service	A
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 (vph)	38	704	149	40	1061	0	128	0	60	0	0	0
Future Volume (vph)	38	704	149	40	1061	0	128	0	60	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0		4.5	4.5				
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		1.00	1.00				
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85				
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00				
Satd. Flow (prot)	3547	5255	1636	1829	5255		1829	1636				
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00				
Satd. Flow (perm)	3547	5255	1636	1829	5255		1829	1636				
Peak-hour factor, PHF	0.90	0.90	0.90	0.94	0.94	0.94	0.84	0.84	0.84	0.25	0.25	0.25
Adj. Flow (vph)	42	782	166	43	1129	0	152	0	71	0	0	0
RTOR Reduction (vph)	0	0	51	0	0	0	0	61	0	0	0	0
Lane Group Flow (vph)	42	782	115	43	1129	0	152	10	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	5.0	90.3	90.3	6.5	91.8		18.2	18.2				
Effective Green, g (s)	5.0	90.3	90.3	6.5	91.8		18.2	18.2				
Actuated g/C Ratio	0.04	0.69	0.69	0.05	0.71		0.14	0.14				
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0		4.5	4.5				
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5		2.0	2.0				
Lane Grp Cap (vph)	136	3650	1136	91	3710		256	229				
v/s Ratio Prot	0.01	0.15		c0.02	c0.21		c0.08	0.01				
v/s Ratio Perm			0.07									
v/c Ratio	0.31	0.21	0.10	0.47	0.30		0.59	0.04				
Uniform Delay, d1	60.8	7.1	6.5	60.1	7.1		52.4	48.4				
Progression Factor	0.97	0.94	2.60	1.14	0.55		1.00	1.00				
Incremental Delay, d2	0.5	0.1	0.2	1.4	0.2		2.5	0.0				
Delay (s)	59.5	6.8	17.1	69.6	4.1		54.9	48.4				
Level of Service	E	A	B	E	A		D	D				
Approach Delay (s)		10.8			6.5			52.8			0.0	
Approach LOS		B			A			D			A	

Intersection Summary			
HCM 2000 Control Delay	12.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	43.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	611	171	65	946	146	61
Future Volume (vph)	611	171	65	946	146	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	4.5	5.5	4.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (prot)	5255	1636	1829	5255	3447	
Flt Permitted	1.00	1.00	0.95	1.00	0.97	
Satd. Flow (perm)	5255	1636	1829	5255	3447	
Peak-hour factor, PHF	0.90	0.90	0.92	0.92	0.85	0.85
Adj. Flow (vph)	679	190	71	1028	172	72
RTOR Reduction (vph)	0	68	0	0	42	0
Lane Group Flow (vph)	679	122	71	1028	202	0
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	83.3	83.3	8.3	96.1	23.9	
Effective Green, g (s)	83.3	83.3	8.3	96.1	23.9	
Actuated g/C Ratio	0.64	0.64	0.06	0.74	0.18	
Clearance Time (s)	5.5	5.5	4.5	5.5	4.5	
Vehicle Extension (s)	4.5	4.5	2.0	4.5	2.0	
Lane Grp Cap (vph)	3367	1048	116	3884	633	
v/s Ratio Prot	0.13		c0.04	c0.20	c0.06	
v/s Ratio Perm		0.07				
v/c Ratio	0.20	0.12	0.61	0.26	0.32	
Uniform Delay, d1	9.6	9.1	59.3	5.5	46.0	
Progression Factor	1.00	3.75	0.75	1.30	1.00	
Incremental Delay, d2	0.1	0.2	6.0	0.2	0.1	
Delay (s)	9.7	34.2	50.7	7.3	46.1	
Level of Service	A	C	D	A	D	
Approach Delay (s)	15.1			10.1	46.1	
Approach LOS	B			B	D	

Intersection Summary			
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	33.6%	ICU Level of Service	A
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 (vph)	195	474	5	70	634	29	13	22	24	9	85	378
Future Volume (vph)	195	474	5	70	634	29	13	22	24	9	85	378
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5	5.5	4.5	5.5	5.5	4.5	5.0	5.0	4.5	5.0	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	0.85	1.00	0.88	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1829	5255	1636	3547	5255	1636	3547	1799	1554	1829	1689	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1829	5255	1636	3547	5255	1636	3547	1799	1554	1829	1689	
Peak-hour factor, PHF	0.81	0.81	0.81	0.93	0.93	0.93	0.67	0.67	0.67	0.88	0.88	0.88
Adj. Flow (vph)	241	585	6	75	682	31	19	33	36	10	97	430
RTOR Reduction (vph)	0	0	3	0	0	19	0	3	23	0	145	0
Lane Group Flow (vph)	241	585	3	75	682	12	19	34	9	10	382	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	21.4	66.8	66.8	6.0	51.4	51.4	2.3	36.4	36.4	1.3	35.4	
Effective Green, g (s)	21.4	66.8	66.8	6.0	51.4	51.4	2.3	36.4	36.4	1.3	35.4	
Actuated g/C Ratio	0.16	0.51	0.51	0.05	0.40	0.40	0.02	0.28	0.28	0.01	0.27	
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5	5.5	4.5	5.0	5.0	4.5	5.0	
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5	4.5	2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	301	2700	840	163	2077	646	62	503	435	18	459	
v/s Ratio Prot	c0.13	0.11		c0.02	c0.13		0.01	0.02		c0.01	c0.23	
v/s Ratio Perm			0.00			0.01			0.01			
v/c Ratio	0.80	0.22	0.00	0.46	0.33	0.02	0.31	0.07	0.02	0.56	0.83	
Uniform Delay, d1	52.2	17.3	15.4	60.4	27.3	23.9	63.1	34.3	33.9	64.1	44.5	
Progression Factor	0.76	1.16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	13.3	0.2	0.0	0.8	0.4	0.1	1.0	0.1	0.0	19.4	12.7	
Delay (s)	53.0	20.2	15.4	61.2	27.7	24.0	64.1	34.4	33.9	83.4	57.2	
Level of Service	D	C	B	E	C	C	E	C	C	F	E	
Approach Delay (s)		29.7			30.8			40.6			57.7	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	37.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	92	0	177	48	8	384
Future Volume (vph)	92	0	177	48	8	384
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0		3.0	3.1		3.0
Lane Util. Factor	1.00		1.00	1.00		1.00
Frt	1.00		1.00	0.85		1.00
Flt Protected	0.95		1.00	1.00		1.00
Satd. Flow (prot)	1829		1925	1636		1923
Flt Permitted	0.95		1.00	1.00		1.00
Satd. Flow (perm)	1829		1925	1636		1916
Peak-hour factor, PHF	0.82	0.82	0.88	0.88	0.90	0.90
Adj. Flow (vph)	112	0	201	55	9	427
RTOR Reduction (vph)	0	0	0	11	0	0
Lane Group Flow (vph)	112	0	201	44	0	436
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	9.1		62.7	62.7		62.7
Effective Green, g (s)	10.2		63.8	63.7		63.8
Actuated g/C Ratio	0.13		0.80	0.80		0.80
Clearance Time (s)	4.1		4.1	4.1		4.1
Vehicle Extension (s)	3.0		3.0	3.0		3.0
Lane Grp Cap (vph)	233		1535	1302		1528
v/s Ratio Prot	c0.06		0.10			
v/s Ratio Perm				0.03		c0.23
v/c Ratio	0.48		0.13	0.03		0.29
Uniform Delay, d1	32.4		1.8	1.7		2.1
Progression Factor	1.00		1.00	1.00		1.00
Incremental Delay, d2	1.6		0.2	0.0		0.5
Delay (s)	34.0		2.0	1.8		2.6
Level of Service	C		A	A		A
Approach Delay (s)	34.0		2.0			2.6
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	6.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	41.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	101	14	296	363	33	205
Future Volume (vph)	101	14	296	363	33	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.1	3.0	3.0	3.0	3.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3657	1636	1829	3657	1829	1636
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3657	1636	1829	3657	1829	1636
Peak-hour factor, PHF	0.73	0.73	0.81	0.81	0.76	0.76
Adj. Flow (vph)	138	19	365	448	43	270
RTOR Reduction (vph)	0	14	0	0	0	185
Lane Group Flow (vph)	138	5	365	448	43	85
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	15.9	15.9	19.7	39.7	20.5	20.5
Effective Green, g (s)	17.0	16.9	20.8	40.8	21.6	21.6
Actuated g/C Ratio	0.25	0.25	0.30	0.60	0.32	0.32
Clearance Time (s)	4.1	4.1	4.1	4.1	4.1	4.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	908	404	556	2181	577	516
v/s Ratio Prot	0.04		c0.20	c0.12	0.02	
v/s Ratio Perm		0.00				c0.05
v/c Ratio	0.15	0.01	0.66	0.21	0.07	0.17
Uniform Delay, d1	20.1	19.4	20.7	6.3	16.4	16.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.0	2.8	0.0	0.3	0.7
Delay (s)	20.1	19.5	23.5	6.4	16.6	17.6
Level of Service	C	B	C	A	B	B
Approach Delay (s)	20.1			14.1	17.5	
Approach LOS	C			B	B	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	68.4	Sum of lost time (s)	9.0
Intersection Capacity Utilization	35.6%	ICU Level of Service	A
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 (vph)	62	309	77	275	768	74	147	552	115	14	399	136
Future Volume (vph)	62	309	77	275	768	74	147	552	115	14	399	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0	5.0	4.5	6.0		5.0	6.0	6.0	4.5	5.5	5.5
Lane Util. Factor	0.97	0.91	0.88	0.97	0.91		0.94	0.95	0.88	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	2840	3547	5175		5157	3657	2819	3547	5255	1597
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	2840	3547	5175		5157	3657	2819	3547	5255	1597
Peak-hour factor, PHF	0.76	0.76	0.76	0.83	0.83	0.83	0.93	0.93	0.93	0.81	0.81	0.81
Adj. Flow (vph)	82	407	101	331	925	89	158	594	124	17	493	168
RTOR Reduction (vph)	0	0	44	0	6	0	0	0	96	0	0	141
Lane Group Flow (vph)	82	407	57	331	1008	0	158	594	28	17	493	27
Confl. Peds. (#/hr)			4			9			7			7
Confl. Bikes (#/hr)			1			1						3
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	7.5	64.6	77.0	17.4	74.5		12.4	30.8	30.8	3.7	22.1	22.1
Effective Green, g (s)	7.5	64.6	77.0	17.4	74.5		12.4	30.8	30.8	3.7	22.1	22.1
Actuated g/C Ratio	0.05	0.47	0.56	0.13	0.54		0.09	0.22	0.22	0.03	0.16	0.16
Clearance Time (s)	4.5	6.0	5.0	4.5	6.0		5.0	6.0	6.0	4.5	5.5	5.5
Vehicle Extension (s)	2.0	3.5	2.0	2.0	3.5		2.0	3.5	3.5	2.0	3.5	3.5
Lane Grp Cap (vph)	193	2468	1590	448	2803		465	819	631	95	844	256
v/s Ratio Prot	0.02	0.08	0.00	c0.09	c0.19		c0.03	c0.16		0.00	0.09	
v/s Ratio Perm			0.02						0.01			0.02
v/c Ratio	0.42	0.16	0.04	0.74	0.36		0.34	0.73	0.04	0.18	0.58	0.11
Uniform Delay, d1	62.9	20.9	13.6	57.9	17.9		58.7	49.4	41.8	65.4	53.4	49.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.1	0.0	5.4	0.4		0.2	3.3	0.0	0.3	1.1	0.2
Delay (s)	63.5	21.1	13.6	63.3	18.3		58.9	52.8	41.8	65.7	54.6	49.5
Level of Service	E	C	B	E	B		E	D	D	E	D	D
Approach Delay (s)		25.7			29.4			52.3			53.6	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	39.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	137.5	Sum of lost time (s)	21.0
Intersection Capacity Utilization	80.3%	ICU Level of Service	D
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 (vph)	6	8	174	91	16	12	376	824	121	11	654	64
Future Volume (vph)	6	8	174	91	16	12	376	824	121	11	654	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.1	4.1	4.1		4.1	4.1	4.1	4.1	4.1	
Lane Util. Factor	1.00	0.91	0.91	0.97	1.00		0.97	0.91	1.00	0.97	0.86	
Frt	1.00	0.87	0.85	1.00	0.94		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1829	1523	2978	3547	1804		3547	5255	1636	3547	6533	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1829	1523	2978	3547	1804		3547	5255	1636	3547	6533	
Peak-hour factor, PHF	0.88	0.88	0.88	0.90	0.90	0.90	0.91	0.91	0.91	0.86	0.86	0.86
Adj. Flow (vph)	7	9	198	101	18	13	413	905	133	13	760	74
RTOR Reduction (vph)	0	45	101	0	9	0	0	0	55	0	11	0
Lane Group Flow (vph)	7	25	36	101	22	0	413	905	78	13	823	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	1.6	34.2	34.2	8.1	40.7		23.0	68.1	76.2	3.2	48.3	
Effective Green, g (s)	1.6	34.2	34.2	8.1	40.7		23.0	68.1	76.2	3.2	48.3	
Actuated g/C Ratio	0.01	0.26	0.26	0.06	0.31		0.18	0.52	0.59	0.02	0.37	
Clearance Time (s)	4.1	4.1	4.1	4.1	4.1		4.1	4.1	4.1	4.1	4.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	22	400	783	221	564		627	2752	1010	87	2427	
v/s Ratio Prot	0.00	c0.02		c0.03	0.01		c0.12	c0.17	0.00	0.00	0.13	
v/s Ratio Perm			0.01						0.04			
v/c Ratio	0.32	0.06	0.05	0.46	0.04		0.66	0.33	0.08	0.15	0.34	
Uniform Delay, d1	63.7	35.9	35.7	58.8	31.1		49.8	17.8	11.7	62.1	29.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.2	0.1	0.0	1.5	0.0		2.5	0.3	0.0	0.8	0.4	
Delay (s)	71.8	36.0	35.8	60.3	31.1		52.4	18.1	11.7	62.9	29.8	
Level of Service	E	D	D	E	C		D	B	B	E	C	
Approach Delay (s)		37.0			53.5			27.3			30.3	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	453	275	919	0	0	541
Future Volume (vph)	453	275	919	0	0	541
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.5	1.5	2.0			2.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frpb, ped/bikes	1.00	1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	5255			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	5255			5255
Peak-hour factor, PHF	0.95	0.95	0.93	0.93	0.88	0.88
Adj. Flow (vph)	477	289	988	0	0	615
RTOR Reduction (vph)	0	164	0	0	0	0
Lane Group Flow (vph)	477	125	988	0	0	615
Confl. Peds. (#/hr)				3		
Confl. Bikes (#/hr)				1		
Turn Type	Prot	Prot	NA			NA
Protected Phases	8	8	2			6
Permitted Phases						
Actuated Green, G (s)	9.5	9.5	15.9			15.9
Effective Green, g (s)	12.5	12.5	18.9			18.9
Actuated g/C Ratio	0.36	0.36	0.54			0.54
Clearance Time (s)	4.5	4.5	5.0			5.0
Vehicle Extension (s)	2.0	2.0	3.5			3.5
Lane Grp Cap (vph)	1270	1031	2845			2845
v/s Ratio Prot	c0.13	0.04	c0.19			0.12
v/s Ratio Perm						
v/c Ratio	0.38	0.12	0.35			0.22
Uniform Delay, d1	8.3	7.5	4.5			4.2
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.1	0.0	0.1			0.0
Delay (s)	8.4	7.5	4.6			4.2
Level of Service	A	A	A			A
Approach Delay (s)	8.1		4.6			4.2
Approach LOS	A		A			A

Intersection Summary			
HCM 2000 Control Delay	5.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	34.9	Sum of lost time (s)	3.5
Intersection Capacity Utilization	37.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	718	975	0	367	883	0
Future Volume (vph)	718	975	0	367	883	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.5	1.5		2.0	2.1	
Lane Util. Factor	0.97	0.88		0.91	0.91	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3547	2880		5255	5255	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3547	2880		5255	5255	
Peak-hour factor, PHF	0.96	0.96	0.90	0.90	0.90	0.90
Adj. Flow (vph)	748	1016	0	408	981	0
RTOR Reduction (vph)	0	109	0	0	0	0
Lane Group Flow (vph)	748	907	0	408	981	0
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases	4					
Actuated Green, G (s)	18.5	18.5		17.2	17.2	
Effective Green, g (s)	21.5	21.5		20.2	20.1	
Actuated g/C Ratio	0.48	0.48		0.45	0.44	
Clearance Time (s)	4.5	4.5		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		3.5	3.5	
Lane Grp Cap (vph)	1687	1369		2348	2336	
v/s Ratio Prot	0.21	c0.31		0.08	c0.19	
v/s Ratio Perm						
v/c Ratio	0.44	0.66		0.17	0.42	
Uniform Delay, d1	7.9	9.1		7.5	8.6	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.9		0.0	0.1	
Delay (s)	7.9	10.0		7.5	8.7	
Level of Service	A	B		A	A	
Approach Delay (s)	9.1			7.5	8.7	
Approach LOS	A			A	A	

Intersection Summary			
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	45.2	Sum of lost time (s)	3.6
Intersection Capacity Utilization	72.2%	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 (vph)	75	324	12	37	913	21	28	7	7	23	23	172
Future Volume (vph)	75	324	12	37	913	21	28	7	7	23	23	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1829	5255	1636	3547	5237		1829	1925	1636	1829	1925	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1829	5255	1636	3547	5237		1829	1925	1636	1829	1925	1636
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	83	360	13	41	1014	23	31	8	8	26	26	191
RTOR Reduction (vph)	0	0	5	0	1	0	0	0	7	0	0	166
Lane Group Flow (vph)	83	360	8	41	1036	0	31	8	1	26	26	25
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	8.7	65.3	65.3	4.4	61.0		4.7	15.6	15.6	3.2	14.1	14.1
Effective Green, g (s)	8.7	65.3	65.3	4.4	61.0		4.7	15.6	15.6	3.2	14.1	14.1
Actuated g/C Ratio	0.08	0.62	0.62	0.04	0.58		0.04	0.15	0.15	0.03	0.13	0.13
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	150	3237	1007	147	3013		81	283	240	55	256	217
v/s Ratio Prot	c0.05	0.07		0.01	c0.20		c0.02	0.00		0.01	0.01	
v/s Ratio Perm			0.00						0.00			c0.02
v/c Ratio	0.55	0.11	0.01	0.28	0.34		0.38	0.03	0.00	0.47	0.10	0.12
Uniform Delay, d1	46.8	8.4	7.9	49.3	11.9		49.2	38.7	38.6	50.6	40.4	40.5
Progression Factor	1.00	1.00	1.00	1.21	0.60		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.4	0.1	0.0	1.0	0.3		3.0	0.0	0.0	6.3	0.2	0.2
Delay (s)	51.1	8.5	7.9	60.7	7.5		52.2	38.7	38.6	56.9	40.6	40.7
Level of Service	D	A	A	E	A		D	D	D	E	D	D
Approach Delay (s)		16.2			9.5			47.6			42.4	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	106.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	43.3%	ICU Level of Service	A
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 (vph)	5	338	49	109	910	5	46	0	34	14	0	18
Future Volume (vph)	5	338	49	109	910	5	46	0	34	14	0	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.91		0.97	0.91			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.98	
Satd. Flow (prot)	1829	5156		3547	5250			1829	1636		1742	
Flt Permitted	0.95	1.00		0.95	1.00			0.83	1.00		0.88	
Satd. Flow (perm)	1829	5156		3547	5250			1588	1636		1572	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	6	376	54	121	1011	6	51	0	38	16	0	20
RTOR Reduction (vph)	0	9	0	0	0	0	0	0	33	0	31	0
Lane Group Flow (vph)	6	421	0	121	1017	0	0	51	5	0	5	0
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	1.4	69.4		9.0	77.0			14.1	14.1		14.1	
Effective Green, g (s)	1.4	69.4		9.0	77.0			14.1	14.1		14.1	
Actuated g/C Ratio	0.01	0.65		0.08	0.73			0.13	0.13		0.13	
Clearance Time (s)	4.0	5.5		4.0	5.5			4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	24	3375		301	3813			211	217		209	
v/s Ratio Prot	0.00	0.08		c0.03	c0.19							
v/s Ratio Perm								c0.03	0.00		0.00	
v/c Ratio	0.25	0.12		0.40	0.27			0.24	0.02		0.02	
Uniform Delay, d1	51.8	6.9		46.0	4.9			41.2	40.0		40.0	
Progression Factor	1.22	0.56		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	5.4	0.1		0.9	0.2			0.6	0.0		0.0	
Delay (s)	68.5	4.0		46.8	5.1			41.8	40.0		40.0	
Level of Service	E	A		D	A			D	D		D	
Approach Delay (s)		4.8			9.5			41.0			40.0	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	106.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	40.8%	ICU Level of Service	A
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 (vph)	82	107	169	460	502	31	252	451	111	24	872	127
Future Volume (vph)	82	107	169	460	502	31	252	451	111	24	872	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	5.0	5.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	0.97	0.95	0.88	0.94	0.95		0.94	0.95	1.00	0.97	0.86	0.88
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	2880	5157	3625		5157	3657	1636	3547	6621	2880
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	2880	5157	3625		5157	3657	1636	3547	6621	2880
Peak-hour factor, PHF	0.91	0.91	0.91	0.89	0.89	0.89	0.94	0.94	0.94	0.85	0.85	0.85
Adj. Flow (vph)	90	118	186	517	564	35	268	480	118	28	1026	149
RTOR Reduction (vph)	0	0	53	0	3	0	0	0	79	0	0	110
Lane Group Flow (vph)	90	118	133	517	596	0	268	480	39	28	1026	39
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	16.1	22.0	38.1	16.8	22.7		16.1	34.6	34.6	8.6	27.1	27.1
Effective Green, g (s)	16.1	22.0	38.1	16.8	22.7		16.1	34.6	34.6	8.6	27.1	27.1
Actuated g/C Ratio	0.15	0.21	0.37	0.16	0.22		0.15	0.33	0.33	0.08	0.26	0.26
Clearance Time (s)	5.0	6.0	5.0	5.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	2.0	3.0	2.0	2.0	3.0		2.0	4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)	549	773	1055	833	791		798	1216	544	293	1725	750
v/s Ratio Prot	0.03	0.03	0.02	c0.10	c0.16		c0.05	c0.13		0.01	c0.15	
v/s Ratio Perm			0.03						0.02			0.01
v/c Ratio	0.16	0.15	0.13	0.62	0.75		0.34	0.39	0.07	0.10	0.59	0.05
Uniform Delay, d1	38.1	33.4	21.9	40.6	38.0		39.2	26.7	23.7	44.1	33.6	28.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.1	0.0	1.0	4.1		0.1	0.3	0.1	0.1	0.7	0.0
Delay (s)	38.2	33.5	21.9	41.7	42.1		39.3	26.9	23.8	44.2	34.3	28.9
Level of Service	D	C	C	D	D		D	C	C	D	C	C
Approach Delay (s)		29.1			41.9			30.3			33.9	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	541	255	1066	0	0	849
Future Volume (vph)	541	255	1066	0	0	849
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.1	2.1	2.0			2.0
Lane Util. Factor	0.97	0.88	0.95			0.91
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	3657			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	3657			5255
Peak-hour factor, PHF	0.96	0.96	0.94	0.94	0.90	0.90
Adj. Flow (vph)	564	266	1134	0	0	943
RTOR Reduction (vph)	0	89	0	0	0	0
Lane Group Flow (vph)	564	177	1134	0	0	943
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		6			2
Permitted Phases	4	4				
Actuated Green, G (s)	12.0	12.0	20.6			20.6
Effective Green, g (s)	14.0	14.0	23.6			23.6
Actuated g/C Ratio	0.34	0.34	0.57			0.57
Clearance Time (s)	4.1	4.1	5.0			5.0
Vehicle Extension (s)	3.0	3.0	3.5			3.5
Lane Grp Cap (vph)	1190	966	2069			2974
v/s Ratio Prot	c0.16		c0.31			0.18
v/s Ratio Perm		0.06				
v/c Ratio	0.47	0.18	0.55			0.32
Uniform Delay, d1	10.9	9.8	5.7			4.8
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.3	0.1	0.3			0.1
Delay (s)	11.2	9.9	6.0			4.9
Level of Service	B	A	A			A
Approach Delay (s)	10.8		6.0			4.9
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	41.7	Sum of lost time (s)	6.5
Intersection Capacity Utilization	74.2%	ICU Level of Service	D
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 (vph)	619	140	682	176	0	328	0	933	94	165	1069	0
Future Volume (vph)	619	140	682	176	0	328	0	933	94	165	1069	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5		4.5		5.0	5.0	4.5	5.0	
Lane Util. Factor	0.97	1.00	1.00	0.97		0.88		0.91	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3547	1925	1636	3547		2880		5255	1636	1829	3657	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3547	1925	1636	3547		2880		5255	1636	1829	3657	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.91	0.91	0.91	0.94	0.94	0.94
Adj. Flow (vph)	666	151	733	189	0	353	0	1025	103	176	1137	0
RTOR Reduction (vph)	0	0	64	0	0	0	0	0	76	0	0	0
Lane Group Flow (vph)	666	151	669	189	0	353	0	1025	27	176	1137	0
Turn Type	Split	NA	Perm	Prot		pt+ov		NA	Perm	Prot	NA	
Protected Phases	4	4		8		1 8		2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	40.6	40.6	40.6	8.1		23.1		27.2	27.2	10.5	42.2	
Effective Green, g (s)	40.6	40.6	40.6	8.1		23.1		27.2	27.2	10.5	42.2	
Actuated g/C Ratio	0.39	0.39	0.39	0.08		0.22		0.26	0.26	0.10	0.40	
Clearance Time (s)	4.5	4.5	4.5	4.5				5.0	5.0	4.5	5.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0				3.5	3.5	2.0	3.5	
Lane Grp Cap (vph)	1372	745	633	273		634		1362	424	183	1471	
v/s Ratio Prot	0.19	0.08		0.05		c0.12		0.20		c0.10	c0.31	
v/s Ratio Perm			c0.41						0.02			
v/c Ratio	0.49	0.20	1.06	0.69		0.56		0.75	0.06	0.96	0.77	
Uniform Delay, d1	24.3	21.4	32.2	47.2		36.4		35.8	29.3	47.0	27.2	
Progression Factor	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.0	51.9	6.0		0.6		2.5	0.1	54.8	2.7	
Delay (s)	24.4	21.4	84.0	53.2		37.0		38.2	29.3	101.8	29.9	
Level of Service	C	C	F	D		D		D	C	F	C	
Approach Delay (s)		52.3			42.6			37.4			39.5	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	43.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	104.9	Sum of lost time (s)	18.5
Intersection Capacity Utilization	88.1%	ICU Level of Service	E
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 (vph)	45	52	2	291	213	4	1	10	41	23	182	48
Future Volume (vph)	45	52	2	291	213	4	1	10	41	23	182	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1		4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	
Lane Util. Factor	1.00	1.00		0.97	0.95	1.00	1.00	0.91	0.91	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.90	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1829	1911		3547	3657	1611	1829	3147	1489	1829	3543	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1829	1911		3547	3657	1611	1829	3147	1489	1829	3543	
Peak-hour factor, PHF	0.78	0.78	0.78	0.68	0.68	0.68	0.97	0.97	0.97	0.81	0.81	0.81
Adj. Flow (vph)	58	67	3	428	313	6	1	10	42	28	225	59
RTOR Reduction (vph)	0	2	0	0	0	5	0	10	10	0	17	0
Lane Group Flow (vph)	58	68	0	428	313	1	1	21	11	28	267	0
Confl. Peds. (#/hr)			1			2						
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	5.5	14.1		11.9	20.5	20.5	1.2	53.5	53.5	4.1	56.4	
Effective Green, g (s)	5.5	14.1		11.9	20.5	20.5	1.2	53.5	53.5	4.1	56.4	
Actuated g/C Ratio	0.06	0.14		0.12	0.20	0.20	0.01	0.54	0.54	0.04	0.56	
Clearance Time (s)	4.1	4.1		4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	100	269		422	749	330	21	1683	796	74	1998	
v/s Ratio Prot	0.03	0.04		c0.12	c0.09		0.00	0.01		c0.02	c0.08	
v/s Ratio Perm						0.00			0.01			
v/c Ratio	0.58	0.25		1.01	0.42	0.00	0.05	0.01	0.01	0.38	0.13	
Uniform Delay, d1	46.1	38.3		44.0	34.6	31.6	48.8	10.9	10.9	46.7	10.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.9	0.5		47.4	0.4	0.0	0.9	0.0	0.0	3.2	0.1	
Delay (s)	54.0	38.8		91.5	34.9	31.6	49.8	10.9	10.9	49.9	10.4	
Level of Service	D	D		F	C	C	D	B	B	D	B	
Approach Delay (s)		45.7			67.3			11.6			14.0	
Approach LOS		D			E			B			B	

Intersection Summary			
HCM 2000 Control Delay	49.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	31.3%	ICU Level of Service	A
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		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	34	0	0	238	7	42	2	131	24	28	349	3
Future Volume (vph)	34	0	0	238	7	42	2	131	24	28	349	3
Peak Hour Factor	0.25	0.25	0.25	0.77	0.77	0.77	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	136	0	0	309	9	55	2	154	28	33	411	4

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total (vph)	136	318	55	79	105	448
Volume Left (vph)	136	309	0	2	0	33
Volume Right (vph)	0	0	55	0	28	4
Hadj (s)	0.23	0.23	-0.57	0.05	-0.15	0.04
Departure Headway (s)	6.8	6.4	3.2	6.9	6.7	6.0
Degree Utilization, x	0.26	0.56	0.05	0.15	0.20	0.74
Capacity (veh/h)	452	529	1121	461	469	584
Control Delay (s)	12.2	17.3	6.4	9.9	10.1	24.2
Approach Delay (s)	12.2	15.7		10.0		24.2
Approach LOS	B	C		B		C

Intersection Summary			
Delay	17.7		
Level of Service	C		
Intersection Capacity Utilization	50.5%	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)	96	143	22	103	408	242	26	191	78	549	814	636
Future Volume (vph)	96	143	22	103	408	242	26	191	78	549	814	636
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	1636	3547	5255	1636	3547	5255	1636	3547	5255	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	1636	3547	5255	1636	3547	5255	1636	3547	5255	1636
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.87	0.92	0.93
Adj. Flow (vph)	113	168	26	121	480	285	31	225	92	631	885	684
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	113	168	26	121	480	285	31	225	92	631	885	684
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			Free			Free			Free			Free
Actuated Green, G (s)	5.4	15.8	76.9	5.4	15.8	76.9	2.1	17.3	76.9	18.4	33.6	76.9
Effective Green, g (s)	6.4	18.8	76.9	6.4	18.8	76.9	3.1	20.3	76.9	19.4	36.6	76.9
Actuated g/C Ratio	0.08	0.24	1.00	0.08	0.24	1.00	0.04	0.26	1.00	0.25	0.48	1.00
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	295	1284	1636	295	1284	1636	142	1387	1636	894	2501	1636
v/s Ratio Prot	0.03	0.03		0.03	0.09		0.01	0.04		c0.18	0.17	
v/s Ratio Perm			0.02			0.17			0.06			c0.42
v/c Ratio	0.38	0.13	0.02	0.41	0.37	0.17	0.22	0.16	0.06	0.71	0.35	0.42
Uniform Delay, d1	33.4	22.7	0.0	33.5	24.2	0.0	35.7	21.8	0.0	26.2	12.7	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	0.0	0.0	0.9	0.2	0.2	0.8	0.1	0.1	2.6	0.1	0.8
Delay (s)	34.2	22.7	0.0	34.4	24.3	0.2	36.5	21.8	0.1	28.7	12.8	0.8
Level of Service	C	C	A	C	C	A	D	C	A	C	B	A
Approach Delay (s)		25.0			18.0			17.4			13.6	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	76.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
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 (vph)	8	1	32	56	0	26	69	2172	12	17	1417	26
Future Volume (vph)	8	1	32	56	0	26	69	2172	12	17	1417	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5		4.0	4.0		3.5	5.0	4.0	3.5	5.0	4.0
Lane Util. Factor		1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.89		1.00	0.85		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.99		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1706		1829	1636		1829	3657	1636	1829	3657	1636
Flt Permitted		0.95		0.61	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1636		1183	1636		1829	3657	1636	1829	3657	1636
Peak-hour factor, PHF	0.60	0.60	0.60	0.73	0.73	0.73	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	13	2	53	77	0	36	74	2335	13	18	1540	28
RTOR Reduction (vph)	0	47	0	0	32	0	0	0	13	0	0	28
Lane Group Flow (vph)	0	21	0	77	4	0	74	2335	0	18	1540	0
Turn Type	Perm	NA		Perm	NA		Prot	NA	NA	Prot	NA	NA
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		14.2		13.7	13.7		7.9	101.0	0.0	2.8	95.9	0.0
Effective Green, g (s)		14.2		13.7	13.7		7.9	101.0	0.0	2.8	95.9	0.0
Actuated g/C Ratio		0.11		0.11	0.11		0.06	0.78	0.00	0.02	0.74	0.00
Clearance Time (s)		3.5		4.0	4.0		3.5	5.0		3.5	5.0	
Vehicle Extension (s)		2.0		2.0	2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		178		124	172		111	2841	0	39	2697	0
v/s Ratio Prot					0.00		c0.04	c0.64		0.01	0.42	
v/s Ratio Perm		0.01		c0.07								
v/c Ratio		0.12		0.62	0.02		0.67	0.82	0.00	0.46	0.57	0.00
Uniform Delay, d1		52.2		55.7	52.1		59.8	8.9	65.0	62.9	7.7	65.0
Progression Factor		1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.1		6.8	0.0		11.1	2.8	0.0	3.1	0.4	0.0
Delay (s)		52.3		62.4	52.2		70.9	11.8	65.0	66.0	8.1	65.0
Level of Service		D		E	D		E	B	E	E	A	E
Approach Delay (s)		52.3			59.2			13.9			9.7	
Approach LOS		D			E			B			A	

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
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 (vph)	150	811	637	395	694	651	752	1434	353	514	1091	95
Future Volume (vph)	150	811	637	395	694	651	752	1434	353	514	1091	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	5.0	5.0	5.5	5.5	5.0	5.5	5.5	5.0	5.5	
Lane Util. Factor	0.97	0.91	0.88	0.94	0.91	1.00	0.94	0.91	0.88	0.97	0.86	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3547	5255	2880	5157	5255	1636	5157	5255	2880	3547	6542	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3547	5255	2880	5157	5255	1636	5157	5255	2880	3547	6542	
Peak-hour factor, PHF	0.91	0.91	0.91	0.93	0.93	0.93	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	165	891	700	425	746	700	775	1478	364	559	1186	103
RTOR Reduction (vph)	0	0	45	0	0	201	0	0	219	0	8	0
Lane Group Flow (vph)	165	891	655	425	746	499	775	1478	145	559	1281	0
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	8.9	41.8	71.2	16.7	50.1	50.1	29.4	51.2	51.2	23.1	44.9	
Effective Green, g (s)	8.9	41.8	71.2	16.7	50.1	50.1	29.4	51.2	51.2	23.1	44.9	
Actuated g/C Ratio	0.06	0.27	0.46	0.11	0.32	0.32	0.19	0.33	0.33	0.15	0.29	
Clearance Time (s)	5.0	6.0	5.0	5.0	5.5	5.5	5.0	5.5	5.5	5.0	5.5	
Vehicle Extension (s)	2.0	4.5	2.0	2.0	4.5	4.5	2.0	4.5	4.5	2.0	4.5	
Lane Grp Cap (vph)	204	1423	1328	558	1706	531	982	1743	955	531	1903	
v/s Ratio Prot	0.05	0.17	0.09	c0.08	0.14		0.15	c0.28		c0.16	0.20	
v/s Ratio Perm			0.13			c0.31			0.05			
v/c Ratio	0.81	0.63	0.49	0.76	0.44	0.94	0.79	0.85	0.15	1.05	0.67	
Uniform Delay, d1	71.9	49.4	29.0	66.9	41.0	50.7	59.5	47.9	36.3	65.6	48.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	19.5	1.1	0.1	5.5	0.3	25.5	4.0	4.4	0.1	53.7	1.1	
Delay (s)	91.3	50.5	29.1	72.4	41.3	76.1	63.5	52.3	36.4	119.3	49.4	
Level of Service	F	D	C	E	D	E	E	D	D	F	D	
Approach Delay (s)		45.8			61.4			53.4			70.5	
Approach LOS		D			E			D			E	

Intersection Summary			
HCM 2000 Control Delay	57.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	154.3	Sum of lost time (s)	21.5
Intersection Capacity Utilization	88.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	295	689	1922	0	0	1417
Future Volume (vph)	295	689	1922	0	0	1417
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0			3.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	5255			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	5255			5255
Peak-hour factor, PHF	0.86	0.86	0.96	0.96	0.95	0.95
Adj. Flow (vph)	343	801	2002	0	0	1492
RTOR Reduction (vph)	0	8	0	0	0	0
Lane Group Flow (vph)	343	793	2002	0	0	1492
Turn Type	Prot	Prot	NA			NA
Protected Phases	4	4	2			6
Permitted Phases	4					
Actuated Green, G (s)	17.9	17.9	30.1			30.1
Effective Green, g (s)	20.9	20.9	33.1			33.1
Actuated g/C Ratio	0.35	0.35	0.55			0.55
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	5.0	5.0	5.0			1.8
Lane Grp Cap (vph)	1235	1003	2899			2899
v/s Ratio Prot	0.10	c0.28	c0.38			0.28
v/s Ratio Perm						
v/c Ratio	0.28	0.79	0.69			0.51
Uniform Delay, d1	14.1	17.6	9.7			8.4
Progression Factor	1.00	1.00	0.78			1.00
Incremental Delay, d2	0.3	4.9	0.1			0.7
Delay (s)	14.4	22.5	7.7			9.1
Level of Service	B	C	A			A
Approach Delay (s)	20.1		7.7			9.1
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1258	1023	0	2470	1457	0
Future Volume (vph)	1258	1023	0	2470	1457	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	
Lane Util. Factor	0.97	0.88		0.91	0.91	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3547	2880		5255	5255	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3547	2880		5255	5255	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	1353	1100	0	2656	1567	0
RTOR Reduction (vph)	0	9	0	0	0	0
Lane Group Flow (vph)	1353	1091	0	2656	1567	0
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases	4			2		
Actuated Green, G (s)	23.9	23.9		24.1	24.1	
Effective Green, g (s)	26.9	26.9		27.1	27.1	
Actuated g/C Ratio	0.45	0.45		0.45	0.45	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	1.8	1.8		5.0	5.0	
Lane Grp Cap (vph)	1590	1291		2373	2373	
v/s Ratio Prot	c0.38	0.38		c0.51	0.30	
v/s Ratio Perm						
v/c Ratio	0.85	0.85		1.12	0.66	
Uniform Delay, d1	14.8	14.7		16.4	12.9	
Progression Factor	1.00	1.00		1.00	1.47	
Incremental Delay, d2	4.4	5.1		60.0	1.4	
Delay (s)	19.2	19.8		76.5	20.2	
Level of Service	B	B		E	C	
Approach Delay (s)	19.4			76.5	20.2	
Approach LOS	B			E	C	

Intersection Summary			
HCM 2000 Control Delay	42.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	133.9%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	14	1634	21	29	1637	86	52
Future Volume (vph)	14	1634	21	29	1637	86	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.9	5.0	3.4	4.9	3.9	3.9
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1829	5255	1636	1829	5255	1829	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	1829	5255	1636	1829	5255	1829	1636
Peak-hour factor, PHF	0.89	0.89	0.89	0.92	0.92	0.77	0.77
Adj. Flow (vph)	16	1836	24	32	1779	112	68
RTOR Reduction (vph)	0	0	4	0	0	0	58
Lane Group Flow (vph)	16	1836	20	32	1779	112	10
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm
Protected Phases	5	2		1	6		
Permitted Phases			2			8	8
Actuated Green, G (s)	2.8	90.3	90.3	6.5	94.0	17.7	17.7
Effective Green, g (s)	3.8	91.4	91.3	7.6	95.1	18.8	18.8
Actuated g/C Ratio	0.03	0.70	0.70	0.06	0.73	0.14	0.14
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0	5.0	5.0
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5	4.5	4.5
Lane Grp Cap (vph)	53	3694	1148	106	3844	264	236
v/s Ratio Prot	0.01	c0.35		0.02	c0.34		
v/s Ratio Perm			0.01			c0.06	0.01
v/c Ratio	0.30	0.50	0.02	0.30	0.46	0.42	0.04
Uniform Delay, d1	61.8	8.8	5.8	58.7	7.1	50.7	47.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	0.5	0.0	0.6	0.4	1.9	0.1
Delay (s)	63.0	9.3	5.9	59.2	7.5	52.6	48.0
Level of Service	E	A	A	E	A	D	D
Approach Delay (s)		9.7			8.4	50.8	
Approach LOS		A			A	D	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.4
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
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 (vph)	13	1523	159	48	1561	0	99	0	59	0	0	0
Future Volume (vph)	13	1523	159	48	1561	0	99	0	59	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0		4.5	4.5				
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		1.00	1.00				
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85				
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00				
Satd. Flow (prot)	3547	5255	1636	1829	5255		1829	1636				
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00				
Satd. Flow (perm)	3547	5255	1636	1829	5255		1829	1636				
Peak-hour factor, PHF	0.91	0.91	0.91	0.94	0.94	0.94	0.90	0.90	0.90	0.25	0.25	0.25
Adj. Flow (vph)	14	1674	175	51	1661	0	110	0	66	0	0	0
RTOR Reduction (vph)	0	0	41	0	0	0	0	58	0	0	0	0
Lane Group Flow (vph)	14	1674	134	51	1661	0	110	8	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	2.2	84.1	84.1	6.8	88.7		14.1	14.1				
Effective Green, g (s)	2.2	84.1	84.1	6.8	88.7		14.1	14.1				
Actuated g/C Ratio	0.02	0.70	0.70	0.06	0.74		0.12	0.12				
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0		4.5	4.5				
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5		2.0	2.0				
Lane Grp Cap (vph)	65	3682	1146	103	3884		214	192				
v/s Ratio Prot	0.00	c0.32		c0.03	0.32		c0.06	0.00				
v/s Ratio Perm			0.08									
v/c Ratio	0.22	0.45	0.12	0.50	0.43		0.51	0.04				
Uniform Delay, d1	58.0	7.9	5.8	54.9	6.0		49.7	47.0				
Progression Factor	1.00	1.00	1.00	1.25	0.28		1.00	1.00				
Incremental Delay, d2	0.6	0.4	0.2	1.3	0.3		0.9	0.0				
Delay (s)	58.7	8.3	6.1	69.7	2.0		50.6	47.0				
Level of Service	E	A	A	E	A		D	D				
Approach Delay (s)		8.5			4.0			49.2			0.0	
Approach LOS		A			A			D			A	

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	1529	105	72	1337	271	86
Future Volume (vph)	1529	105	72	1337	271	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.5	5.5	4.5	5.5	4.5	
Lane Util. Factor	0.91	1.00	1.00	0.91	0.97	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (prot)	5255	1636	1829	5255	3467	
Flt Permitted	1.00	1.00	0.95	1.00	0.96	
Satd. Flow (perm)	5255	1636	1829	5255	3467	
Peak-hour factor, PHF	0.94	0.94	0.93	0.93	0.89	0.89
Adj. Flow (vph)	1627	112	77	1438	304	97
RTOR Reduction (vph)	0	40	0	0	31	0
Lane Group Flow (vph)	1627	72	77	1438	370	0
Turn Type	NA	Perm	Prot	NA	Prot	
Protected Phases	2		1	6	8	
Permitted Phases		2				
Actuated Green, G (s)	74.8	74.8	8.2	87.5	22.5	
Effective Green, g (s)	74.8	74.8	8.2	87.5	22.5	
Actuated g/C Ratio	0.62	0.62	0.07	0.73	0.19	
Clearance Time (s)	5.5	5.5	4.5	5.5	4.5	
Vehicle Extension (s)	4.5	4.5	2.0	4.5	2.0	
Lane Grp Cap (vph)	3275	1019	124	3831	650	
v/s Ratio Prot	c0.31		c0.04	0.27	c0.11	
v/s Ratio Perm		0.04				
v/c Ratio	0.50	0.07	0.62	0.38	0.57	
Uniform Delay, d1	12.3	8.9	54.4	6.1	44.3	
Progression Factor	0.49	0.74	0.74	1.64	1.00	
Incremental Delay, d2	0.5	0.1	6.1	0.3	0.7	
Delay (s)	6.5	6.7	46.5	10.2	45.0	
Level of Service	A	A	D	B	D	
Approach Delay (s)	6.5			12.0	45.0	
Approach LOS	A			B	D	

Intersection Summary			
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.5
Intersection Capacity Utilization	56.0%	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												
Traffic Volume (vph)	263	1289	56	32	976	21	70	83	90	31	43	377
Future Volume (vph)	263	1289	56	32	976	21	70	83	90	31	43	377
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5	5.5	4.5	5.5	5.5	4.5	5.0	5.0	4.5	5.0	
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	0.95	0.95	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	0.85	1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1829	5255	1636	3547	5255	1636	3547	1799	1554	1829	1666	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1829	5255	1636	3547	5255	1636	3547	1799	1554	1829	1666	
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.92	0.85	0.85	0.85	0.91	0.91	0.91
Adj. Flow (vph)	277	1357	59	35	1061	23	82	98	106	34	47	414
RTOR Reduction (vph)	0	0	24	0	0	13	0	5	78	0	336	0
Lane Group Flow (vph)	277	1357	35	35	1061	10	82	105	16	34	125	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	24.3	71.6	71.6	4.5	51.8	51.8	5.7	20.1	20.1	4.3	18.7	
Effective Green, g (s)	24.3	71.6	71.6	4.5	51.8	51.8	5.7	20.1	20.1	4.3	18.7	
Actuated g/C Ratio	0.20	0.60	0.60	0.04	0.43	0.43	0.05	0.17	0.17	0.04	0.16	
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5	5.5	4.5	5.0	5.0	4.5	5.0	
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5	4.5	2.0	4.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	370	3135	976	133	2268	706	168	301	260	65	259	
v/s Ratio Prot	c0.15	0.26		0.01	c0.20		c0.02	0.06		0.02	c0.08	
v/s Ratio Perm			0.02			0.01			0.01			
v/c Ratio	0.75	0.43	0.04	0.26	0.47	0.01	0.49	0.35	0.06	0.52	0.48	
Uniform Delay, d1	45.0	13.2	10.0	56.1	24.3	19.5	55.7	44.2	42.0	56.8	46.2	
Progression Factor	0.66	0.86	13.10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.3	0.4	0.1	0.4	0.7	0.0	0.8	1.0	0.1	3.5	1.9	
Delay (s)	36.0	11.7	130.8	56.5	25.0	19.5	56.5	45.1	42.1	60.3	48.2	
Level of Service	D	B	F	E	C	B	E	D	D	E	D	
Approach Delay (s)		19.9			25.9			47.4			49.0	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	148	1	289	81	3	298
Future Volume (vph)	148	1	289	81	3	298
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.1	3.0	3.1		3.0
Lane Util. Factor	1.00	1.00	1.00	1.00		1.00
Frt	1.00	0.85	1.00	0.85		1.00
Flt Protected	0.95	1.00	1.00	1.00		1.00
Satd. Flow (prot)	1829	1636	1925	1636		1924
Flt Permitted	0.95	1.00	1.00	1.00		1.00
Satd. Flow (perm)	1829	1636	1925	1636		1920
Peak-hour factor, PHF	0.82	0.82	0.93	0.93	0.85	0.85
Adj. Flow (vph)	180	1	311	87	4	351
RTOR Reduction (vph)	0	1	0	22	0	0
Lane Group Flow (vph)	180	0	311	65	0	355
Turn Type	Prot	Perm	NA	Perm	Perm	NA
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	13.0	13.0	58.8	58.8		58.8
Effective Green, g (s)	14.1	14.0	59.9	59.8		59.9
Actuated g/C Ratio	0.18	0.18	0.75	0.75		0.75
Clearance Time (s)	4.1	4.1	4.1	4.1		4.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	322	286	1441	1222		1437
v/s Ratio Prot	c0.10		0.16			
v/s Ratio Perm		0.00		0.04		c0.18
v/c Ratio	0.56	0.00	0.22	0.05		0.25
Uniform Delay, d1	30.1	27.2	3.0	2.7		3.1
Progression Factor	1.00	1.00	1.00	1.00		1.00
Incremental Delay, d2	2.1	0.0	0.3	0.1		0.4
Delay (s)	32.2	27.2	3.4	2.7		3.5
Level of Service	C	C	A	A		A
Approach Delay (s)	32.2		3.2			3.5
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	33.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	274	16	90	192	13	326
Future Volume (vph)	274	16	90	192	13	326
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.1	3.0	3.4	3.0	3.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3657	1636	1829	3657	1829	1636
Flt Permitted	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (perm)	3657	1636	1829	3657	1829	1636
Peak-hour factor, PHF	0.97	0.97	0.91	0.91	0.85	0.85
Adj. Flow (vph)	282	16	99	211	15	384
RTOR Reduction (vph)	0	10	0	0	0	288
Lane Group Flow (vph)	282	6	99	211	15	96
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4				2
Actuated Green, G (s)	15.2	15.2	5.1	24.0	9.4	9.4
Effective Green, g (s)	16.3	16.2	6.2	25.1	10.5	10.5
Actuated g/C Ratio	0.39	0.39	0.15	0.60	0.25	0.25
Clearance Time (s)	4.1	4.1	4.1	4.5	4.1	4.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1419	631	269	2185	457	409
v/s Ratio Prot	c0.08		c0.05	0.06	0.01	
v/s Ratio Perm		0.00				c0.06
v/c Ratio	0.20	0.01	0.37	0.10	0.03	0.23
Uniform Delay, d1	8.5	8.0	16.1	3.6	11.9	12.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.0	0.9	0.0	0.0	0.3
Delay (s)	8.6	8.0	17.0	3.6	11.9	12.8
Level of Service	A	A	B	A	B	B
Approach Delay (s)	8.6			7.9	12.8	
Approach LOS	A			A	B	

Intersection Summary			
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	42.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	35.2%	ICU Level of Service	A
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 (vph)	102	948	166	188	520	20	186	518	428	83	567	92
Future Volume (vph)	102	948	166	188	520	20	186	518	428	83	567	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0	5.0	4.5	6.0		5.0	6.0	6.0	4.5	5.5	5.5
Lane Util. Factor	0.97	0.91	0.88	0.97	0.91		0.94	0.95	0.88	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	2837	3547	5221		5157	3657	2793	3547	5255	1609
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	2837	3547	5221		5157	3657	2793	3547	5255	1609
Peak-hour factor, PHF	0.91	0.91	0.91	0.86	0.86	0.86	0.93	0.93	0.93	0.91	0.91	0.91
Adj. Flow (vph)	112	1042	182	219	605	23	200	557	460	91	623	101
RTOR Reduction (vph)	0	0	40	0	2	0	0	0	367	0	0	83
Lane Group Flow (vph)	112	1042	142	219	626	0	200	557	93	91	623	18
Confl. Peds. (#/hr)			5			9			13			4
Confl. Bikes (#/hr)			1			1			1			
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	8.6	66.5	78.6	12.7	70.6		12.1	27.6	27.6	8.7	24.2	24.2
Effective Green, g (s)	8.6	66.5	78.6	12.7	70.6		12.1	27.6	27.6	8.7	24.2	24.2
Actuated g/C Ratio	0.06	0.49	0.58	0.09	0.52		0.09	0.20	0.20	0.06	0.18	0.18
Clearance Time (s)	4.5	6.0	5.0	4.5	6.0		5.0	6.0	6.0	4.5	5.5	5.5
Vehicle Extension (s)	2.0	3.5	2.0	2.0	3.5		2.0	3.5	3.5	2.0	3.5	3.5
Lane Grp Cap (vph)	223	2560	1633	330	2700		457	739	564	226	931	285
v/s Ratio Prot	0.03	c0.20	0.01	c0.06	c0.12		c0.04	c0.15		0.03	0.12	
v/s Ratio Perm			0.04						0.03			0.01
v/c Ratio	0.50	0.41	0.09	0.66	0.23		0.44	0.75	0.16	0.40	0.67	0.06
Uniform Delay, d1	61.9	22.4	12.9	59.8	18.1		59.0	51.3	44.9	61.4	52.4	46.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.5	0.0	3.9	0.2		0.2	4.5	0.2	0.4	1.9	0.1
Delay (s)	62.5	22.9	12.9	63.7	18.3		59.2	55.8	45.1	61.8	54.3	46.8
Level of Service	E	C	B	E	B		E	E	D	E	D	D
Approach Delay (s)		24.8			30.0			52.3			54.2	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	39.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	136.5	Sum of lost time (s)	21.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
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 (vph)	41	32	446	253	53	25	435	1217	445	64	875	30
Future Volume (vph)	41	32	446	253	53	25	435	1217	445	64	875	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.1	4.1	4.1		4.1	4.1	4.1	4.1	4.1	
Lane Util. Factor	1.00	0.91	0.91	0.97	1.00		0.97	0.91	1.00	0.97	0.86	
Frt	1.00	0.88	0.85	1.00	0.95		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1829	1541	2978	3547	1832		3547	5255	1636	3547	6588	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1829	1541	2978	3547	1832		3547	5255	1636	3547	6588	
Peak-hour factor, PHF	0.82	0.82	0.82	0.93	0.93	0.93	0.95	0.95	0.95	0.84	0.84	0.84
Adj. Flow (vph)	50	39	544	272	57	27	458	1281	468	76	1042	36
RTOR Reduction (vph)	0	114	232	0	16	0	0	0	214	0	3	0
Lane Group Flow (vph)	50	83	154	272	68	0	458	1281	254	76	1075	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	6.4	36.6	36.6	8.0	38.2		21.1	62.5	70.5	6.5	47.9	
Effective Green, g (s)	6.4	36.6	36.6	8.0	38.2		21.1	62.5	70.5	6.5	47.9	
Actuated g/C Ratio	0.05	0.28	0.28	0.06	0.29		0.16	0.48	0.54	0.05	0.37	
Clearance Time (s)	4.1	4.1	4.1	4.1	4.1		4.1	4.1	4.1	4.1	4.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	90	433	838	218	538		575	2526	938	177	2427	
v/s Ratio Prot	0.03	c0.05		c0.08	0.04		c0.13	c0.24	0.02	0.02	0.16	
v/s Ratio Perm			0.05						0.14			
v/c Ratio	0.56	0.19	0.18	1.25	0.13		0.80	0.51	0.27	0.43	0.44	
Uniform Delay, d1	60.4	35.5	35.4	61.0	33.7		52.4	23.2	16.0	59.9	31.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.2	0.2	0.1	143.7	0.1		7.5	0.7	0.2	1.7	0.6	
Delay (s)	67.6	35.7	35.5	204.7	33.8		59.9	23.9	16.1	61.6	31.6	
Level of Service	E	D	D	F	C		E	C	B	E	C	
Approach Delay (s)		38.1			164.4			29.7			33.5	
Approach LOS		D			F			C			C	

Intersection Summary			
HCM 2000 Control Delay	43.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	180	244	1452	0	0	751
Future Volume (vph)	180	244	1452	0	0	751
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.5	1.5	2.0			2.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frpb, ped/bikes	1.00	1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	5255			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	5255			5255
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.95	0.95
Adj. Flow (vph)	198	268	1596	0	0	791
RTOR Reduction (vph)	0	68	0	0	0	0
Lane Group Flow (vph)	198	200	1596	0	0	791
Confl. Peds. (#/hr)				9		
Confl. Bikes (#/hr)				1		
Turn Type	Prot	Prot	NA			NA
Protected Phases	8	8	2			6
Permitted Phases						
Actuated Green, G (s)	7.4	7.4	22.5			22.5
Effective Green, g (s)	10.4	10.4	25.5			25.5
Actuated g/C Ratio	0.26	0.26	0.65			0.65
Clearance Time (s)	4.5	4.5	5.0			5.0
Vehicle Extension (s)	2.0	2.0	3.5			3.5
Lane Grp Cap (vph)	936	760	3401			3401
v/s Ratio Prot	0.06	c0.07	c0.30			0.15
v/s Ratio Perm						
v/c Ratio	0.21	0.26	0.47			0.23
Uniform Delay, d1	11.3	11.5	3.5			2.9
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.0	0.1	0.1			0.0
Delay (s)	11.3	11.5	3.6			2.9
Level of Service	B	B	A			A
Approach Delay (s)	11.5		3.6			2.9
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	4.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	39.4	Sum of lost time (s)	3.5
Intersection Capacity Utilization	47.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	780	392	0	1392	600	0
Future Volume (vph)	780	392	0	1392	600	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.5	1.5		2.0	2.1	
Lane Util. Factor	0.97	0.88		0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3547	2880		5255	5255	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3547	2880		5255	5255	
Peak-hour factor, PHF	0.91	0.91	0.87	0.87	0.95	0.95
Adj. Flow (vph)	857	431	0	1600	632	0
RTOR Reduction (vph)	0	236	0	0	0	0
Lane Group Flow (vph)	857	195	0	1600	632	0
Confl. Peds. (#/hr)			8			
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases	4					
Actuated Green, G (s)	18.0	18.0		25.0	25.0	
Effective Green, g (s)	21.0	21.0		28.0	27.9	
Actuated g/C Ratio	0.40	0.40		0.53	0.53	
Clearance Time (s)	4.5	4.5		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		3.5	3.5	
Lane Grp Cap (vph)	1418	1152		2802	2792	
v/s Ratio Prot	c0.24	0.07		c0.30	0.12	
v/s Ratio Perm						
v/c Ratio	0.60	0.17		0.57	0.23	
Uniform Delay, d1	12.5	10.1		8.2	6.6	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.0		0.3	0.0	
Delay (s)	13.0	10.2		8.5	6.6	
Level of Service	B	B		A	A	
Approach Delay (s)	12.0			8.5	6.6	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	52.5	Sum of lost time (s)	3.6
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
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 (vph)	101	1335	125	85	534	36	125	31	109	25	24	63
Future Volume (vph)	101	1335	125	85	534	36	125	31	109	25	24	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1829	5255	1636	3547	5205		1829	1925	1636	1829	1925	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1829	5255	1636	3547	5205		1829	1925	1636	1829	1925	1636
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	112	1483	139	94	593	40	139	34	121	28	27	70
RTOR Reduction (vph)	0	0	54	0	4	0	0	0	96	0	0	60
Lane Group Flow (vph)	112	1483	85	94	629	0	139	34	25	28	27	10
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	13.2	72.1	72.1	8.8	67.7		13.9	26.9	26.9	4.7	17.7	17.7
Effective Green, g (s)	13.2	72.1	72.1	8.8	67.7		13.9	26.9	26.9	4.7	17.7	17.7
Actuated g/C Ratio	0.10	0.55	0.55	0.07	0.52		0.11	0.21	0.21	0.04	0.14	0.14
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	185	2914	907	240	2710		195	398	338	66	262	222
v/s Ratio Prot	c0.06	c0.28		0.03	0.12		c0.08	0.02		0.02	c0.01	
v/s Ratio Perm			0.05						0.02			0.01
v/c Ratio	0.61	0.51	0.09	0.39	0.23		0.71	0.09	0.07	0.42	0.10	0.04
Uniform Delay, d1	55.9	18.0	13.6	58.0	17.0		56.1	41.6	41.5	61.3	49.2	48.8
Progression Factor	1.00	1.00	1.00	1.18	0.73		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.5	0.6	0.2	1.0	0.2		11.6	0.1	0.1	4.3	0.2	0.1
Delay (s)	61.4	18.6	13.8	69.7	12.6		67.8	41.7	41.6	65.7	49.4	48.9
Level of Service	E	B	B	E	B		E	D	D	E	D	D
Approach Delay (s)		21.0			20.0			54.0			52.7	
Approach LOS		C			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
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 (vph)	26	1320	132	202	504	13	144	5	179	6	0	12
Future Volume (vph)	26	1320	132	202	504	13	144	5	179	6	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.91		0.97	0.91			1.00	1.00		1.00	
Frt	1.00	0.99		1.00	1.00			1.00	0.85		0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.98	
Satd. Flow (prot)	1829	5183		3547	5236			1836	1636		1726	
Flt Permitted	0.95	1.00		0.95	1.00			0.72	1.00		0.92	
Satd. Flow (perm)	1829	5183		3547	5236			1384	1636		1612	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	1467	147	224	560	14	160	6	199	7	0	13
RTOR Reduction (vph)	0	7	0	0	1	0	0	0	151	0	16	0
Lane Group Flow (vph)	29	1607	0	224	573	0	0	166	48	0	4	0
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	5.2	75.5		13.5	83.8			27.5	27.5		27.5	
Effective Green, g (s)	5.2	75.5		13.5	83.8			27.5	27.5		27.5	
Actuated g/C Ratio	0.04	0.58		0.10	0.64			0.21	0.21		0.21	
Clearance Time (s)	4.0	5.5		4.0	5.5			4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	73	3010		368	3375			292	346		341	
v/s Ratio Prot	0.02	c0.31		c0.06	0.11							
v/s Ratio Perm								c0.12	0.03		0.00	
v/c Ratio	0.40	0.53		0.61	0.17			0.57	0.14		0.01	
Uniform Delay, d1	60.9	16.6		55.7	9.2			45.9	41.6		40.5	
Progression Factor	1.35	0.18		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	3.2	0.6		2.8	0.1			2.5	0.2		0.0	
Delay (s)	85.2	3.6		58.6	9.3			48.5	41.8		40.5	
Level of Service	F	A		E	A			D	D		D	
Approach Delay (s)		5.0			23.1			44.8			40.5	
Approach LOS		A			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	60.4%	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												
Traffic Volume (vph)	233	823	543	241	281	34	408	604	482	78	534	118
Future Volume (vph)	233	823	543	241	281	34	408	604	482	78	534	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	5.0	5.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Lane Util. Factor	0.97	0.95	0.88	0.94	0.95		0.94	0.95	1.00	0.97	0.86	0.88
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	3657	2880	5157	3598		5157	3657	1636	3547	6621	2880
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	3657	2880	5157	3598		5157	3657	1636	3547	6621	2880
Peak-hour factor, PHF	0.90	0.90	0.90	0.97	0.97	0.97	0.91	0.91	0.91	0.97	0.97	0.97
Adj. Flow (vph)	259	914	603	248	290	35	448	664	530	80	551	122
RTOR Reduction (vph)	0	0	115	0	6	0	0	0	262	0	0	92
Lane Group Flow (vph)	259	914	488	248	319	0	448	664	268	80	551	30
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	16.7	36.5	54.0	16.3	36.1		17.5	32.1	32.1	15.2	29.8	29.8
Effective Green, g (s)	16.7	36.5	54.0	16.3	36.1		17.5	32.1	32.1	15.2	29.8	29.8
Actuated g/C Ratio	0.14	0.30	0.44	0.13	0.30		0.14	0.26	0.26	0.12	0.24	0.24
Clearance Time (s)	5.0	6.0	5.0	5.0	6.0		5.0	6.0	6.0	5.0	6.0	6.0
Vehicle Extension (s)	2.0	3.0	2.0	2.0	3.0		2.0	4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)	485	1093	1273	688	1063		739	961	430	441	1615	702
v/s Ratio Prot	c0.07	c0.25	0.05	0.05	0.09		c0.09	c0.18		0.02	0.08	
v/s Ratio Perm			0.11						0.16			0.01
v/c Ratio	0.53	0.84	0.38	0.36	0.30		0.61	0.69	0.62	0.18	0.34	0.04
Uniform Delay, d1	49.1	40.0	22.9	48.2	33.2		49.1	40.5	39.7	47.9	38.1	35.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	5.7	0.1	0.1	0.2		1.0	2.3	3.2	0.1	0.2	0.0
Delay (s)	49.6	45.7	22.9	48.3	33.4		50.0	42.9	42.9	47.9	38.2	35.3
Level of Service	D	D	C	D	C		D	D	D	D	D	D
Approach Delay (s)		38.5			39.8			44.8			38.8	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	40.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	122.1	Sum of lost time (s)	22.0
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	500	225	1402	0	0	1132
Future Volume (vph)	500	225	1402	0	0	1132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.5	2.5	2.0			2.0
Lane Util. Factor	0.97	0.88	0.95			0.91
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	3657			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	3657			5255
Peak-hour factor, PHF	0.84	0.84	0.91	0.91	0.94	0.94
Adj. Flow (vph)	595	268	1541	0	0	1204
RTOR Reduction (vph)	0	52	0	0	0	0
Lane Group Flow (vph)	595	216	1541	0	0	1204
Turn Type	Prot	Prot	NA			NA
Protected Phases	8	8	2			6
Permitted Phases	8					
Actuated Green, G (s)	12.6	12.6	28.4			28.4
Effective Green, g (s)	14.6	14.6	31.4			31.4
Actuated g/C Ratio	0.29	0.29	0.62			0.62
Clearance Time (s)	4.5	4.5	5.0			5.0
Vehicle Extension (s)	2.0	2.0	3.5			3.5
Lane Grp Cap (vph)	1025	832	2273			3267
v/s Ratio Prot	c0.17	0.08	c0.42			0.23
v/s Ratio Perm						
v/c Ratio	0.58	0.26	0.68			0.37
Uniform Delay, d1	15.3	13.8	6.2			4.7
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.5	0.1	0.8			0.1
Delay (s)	15.9	13.9	7.1			4.8
Level of Service	B	B	A			A
Approach Delay (s)	15.2		7.1			4.8
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	50.5	Sum of lost time (s)	4.5
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
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 (vph)	526	237	320	166	0	475	0	1674	104	285	959	0
Future Volume (vph)	526	237	320	166	0	475	0	1674	104	285	959	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5		4.5		5.0	5.0	4.5	5.0	
Lane Util. Factor	0.97	1.00	1.00	0.97		0.88		0.91	1.00	1.00	0.95	
Frt	1.00	1.00	0.85	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3547	1925	1636	3547		2880		5255	1636	1829	3657	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3547	1925	1636	3547		2880		5255	1636	1829	3657	
Peak-hour factor, PHF	0.79	0.79	0.79	0.81	0.81	0.81	0.90	0.90	0.90	0.91	0.91	0.91
Adj. Flow (vph)	666	300	405	205	0	586	0	1860	116	313	1054	0
RTOR Reduction (vph)	0	0	77	0	0	0	0	0	65	0	0	0
Lane Group Flow (vph)	666	300	328	205	0	586	0	1860	51	313	1054	0
Turn Type	Split	NA	Perm	Prot		pt+ov		NA	Perm	Prot	NA	
Protected Phases	4	4		8		1 8		2		1	6	
Permitted Phases			4	8					2			
Actuated Green, G (s)	27.2	27.2	27.2	8.5		32.6		37.1	37.1	19.6	61.2	
Effective Green, g (s)	27.2	27.2	27.2	8.5		32.6		37.1	37.1	19.6	61.2	
Actuated g/C Ratio	0.25	0.25	0.25	0.08		0.29		0.33	0.33	0.18	0.55	
Clearance Time (s)	4.5	4.5	4.5	4.5				5.0	5.0	4.5	5.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0				3.5	3.5	2.0	3.5	
Lane Grp Cap (vph)	869	472	401	271		846		1757	547	323	2018	
v/s Ratio Prot	0.19	0.16		0.06		c0.20		c0.35		c0.17	0.29	
v/s Ratio Perm			c0.20						0.03			
v/c Ratio	0.77	0.64	0.82	0.76		0.69		1.06	0.09	0.97	0.52	
Uniform Delay, d1	38.9	37.4	39.5	50.2		34.7		36.9	25.4	45.3	15.6	
Progression Factor	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.7	2.1	11.6	10.2		2.0		38.9	0.1	41.0	0.3	
Delay (s)	42.6	39.5	51.1	60.4		36.7		75.8	25.4	86.4	15.9	
Level of Service	D	D	D	E		D		E	C	F	B	
Approach Delay (s)		44.4			42.8			72.9			32.1	
Approach LOS		D			D			E			C	

Intersection Summary			
HCM 2000 Control Delay	51.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	110.9	Sum of lost time (s)	18.5
Intersection Capacity Utilization	82.7%	ICU Level of Service	E
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 (vph)	19	171	0	66	195	7	0	277	399	34	27	30
Future Volume (vph)	19	171	0	66	195	7	0	277	399	34	27	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1		4.1	4.1	4.1		4.1	4.1	4.1	4.1	
Lane Util. Factor	1.00	1.00		0.97	0.95	1.00		0.91	0.91	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98		0.99	0.99	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.94	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1829	1925		3547	3657	1608		3274	1470	1829	3346	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1829	1925		3547	3657	1608		3274	1470	1829	3346	
Peak-hour factor, PHF	0.58	0.58	0.58	0.87	0.87	0.87	0.62	0.62	0.62	0.73	0.73	0.73
Adj. Flow (vph)	33	295	0	76	224	8	0	447	644	47	37	41
RTOR Reduction (vph)	0	0	0	0	0	6	0	83	167	0	16	0
Lane Group Flow (vph)	33	295	0	76	224	2	0	667	174	47	62	0
Confl. Peds. (#/hr)			2			5			1			1
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	4.1	22.0		5.5	23.4	23.4		51.0	51.0	5.1	60.2	
Effective Green, g (s)	4.1	22.0		5.5	23.4	23.4		51.0	51.0	5.1	60.2	
Actuated g/C Ratio	0.04	0.22		0.06	0.23	0.23		0.51	0.51	0.05	0.60	
Clearance Time (s)	4.1	4.1		4.1	4.1	4.1		4.1	4.1	4.1	4.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	74	423		195	855	376		1669	749	93	2014	
v/s Ratio Prot	0.02	c0.15		c0.02	0.06			c0.20		c0.03	0.02	
v/s Ratio Perm						0.00			0.12			
v/c Ratio	0.45	0.70		0.39	0.26	0.00		0.40	0.23	0.51	0.03	
Uniform Delay, d1	46.8	35.9		45.6	31.3	29.4		15.1	13.6	46.2	8.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.2	5.0		1.3	0.2	0.0		0.7	0.7	4.3	0.0	
Delay (s)	51.1	40.9		46.9	31.4	29.4		15.8	14.3	50.5	8.1	
Level of Service	D	D		D	C	C		B	B	D	A	
Approach Delay (s)		41.9			35.2			15.3			24.0	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	55.1%	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		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	30	27	0	70	25	30	1	286	118	45	112	18
Future Volume (vph)	30	27	0	70	25	30	1	286	118	45	112	18
Peak Hour Factor	0.25	0.25	0.25	0.92	0.92	0.92	0.74	0.74	0.74	0.83	0.83	0.83
Hourly flow rate (vph)	120	108	0	76	27	33	1	386	159	54	135	22

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total (vph)	228	103	33	194	352	211
Volume Left (vph)	120	76	0	1	0	54
Volume Right (vph)	0	0	33	0	159	22
Hadj (s)	0.14	0.18	-0.57	0.04	-0.28	0.02
Departure Headway (s)	6.1	6.5	3.2	5.9	5.6	5.9
Degree Utilization, x	0.39	0.19	0.03	0.32	0.55	0.34
Capacity (veh/h)	545	491	1121	588	612	572
Control Delay (s)	12.9	10.9	6.3	10.5	14.0	11.9
Approach Delay (s)	12.9	9.8		12.7		11.9
Approach LOS	B	A		B		B

Intersection Summary			
Delay	12.3		
Level of Service	B		
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)	712	628	48	148	258	781	14	681	159	572	289	192
Future Volume (vph)	712	628	48	148	258	781	14	681	159	572	289	192
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	1636	3547	5255	1636	3547	5255	1636	3547	5255	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	1636	3547	5255	1636	3547	5255	1636	3547	5255	1636
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.87	0.92	0.93
Adj. Flow (vph)	838	739	56	174	304	919	16	801	187	657	314	206
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	838	739	56	174	304	919	16	801	187	657	314	206
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			Free			Free			Free			Free
Actuated Green, G (s)	27.5	33.1	104.7	10.3	15.9	104.7	2.3	24.0	104.7	17.3	39.0	104.7
Effective Green, g (s)	28.5	36.1	104.7	11.3	18.9	104.7	3.3	27.0	104.7	18.3	42.0	104.7
Actuated g/C Ratio	0.27	0.34	1.00	0.11	0.18	1.00	0.03	0.26	1.00	0.17	0.40	1.00
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	965	1811	1636	382	948	1636	111	1355	1636	619	2108	1636
v/s Ratio Prot	c0.24	0.14		0.05	0.06		0.00	0.15		c0.19	0.06	
v/s Ratio Perm			0.03			c0.56			0.11			0.13
v/c Ratio	0.87	0.41	0.03	0.46	0.32	0.56	0.14	0.59	0.11	1.06	0.15	0.13
Uniform Delay, d1	36.3	26.2	0.0	43.8	37.3	0.0	49.3	34.0	0.0	43.2	20.0	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.4	0.2	0.0	0.9	0.2	1.4	0.6	0.7	0.1	53.6	0.0	0.2
Delay (s)	44.7	26.3	0.0	44.7	37.5	1.4	49.9	34.7	0.1	96.8	20.0	0.2
Level of Service	D	C	A	D	D	A	D	C	A	F	C	A
Approach Delay (s)		34.8			14.6			28.5			59.4	
Approach LOS		C			B			C			E	

Intersection Summary			
HCM 2000 Control Delay	33.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	104.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Appendix D – Near-Term Conditions Level of Service Analysis Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	0	67	50	1	256	16	992	15	257	2033	6
Future Volume (vph)	17	0	67	50	1	256	16	992	15	257	2033	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5		4.0	4.0	4.0	3.5	5.0		3.5	5.0	5.0
Lane Util. Factor		1.00		1.00	1.00	0.88	1.00	0.91		1.00	0.91	1.00
Frt		0.89		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected		0.99		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1700		1829	1925	2880	1829	5243		1829	5255	1636
Flt Permitted		0.94		0.39	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1620		757	1925	2880	1829	5243		1829	5255	1636
Peak-hour factor, PHF	0.63	0.63	0.63	0.77	0.77	0.92	0.93	0.93	0.93	0.96	0.96	0.96
Adj. Flow (vph)	27	0	106	65	1	278	17	1067	16	268	2118	6
RTOR Reduction (vph)	0	67	0	0	0	246	0	1	0	0	0	1
Lane Group Flow (vph)	0	66	0	65	1	32	17	1082	0	268	2118	5
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						6
Actuated Green, G (s)		15.4		14.9	14.9	14.9	2.8	79.1		23.5	99.8	99.8
Effective Green, g (s)		15.4		14.9	14.9	14.9	2.8	79.1		23.5	99.8	99.8
Actuated g/C Ratio		0.12		0.11	0.11	0.11	0.02	0.61		0.18	0.77	0.77
Clearance Time (s)		3.5		4.0	4.0	4.0	3.5	5.0		3.5	5.0	5.0
Vehicle Extension (s)		2.0		2.0	2.0	2.0	2.0	4.0		2.0	4.0	4.0
Lane Grp Cap (vph)		191		86	220	330	39	3190		330	4034	1255
v/s Ratio Prot					0.00		0.01	0.21		c0.15	c0.40	
v/s Ratio Perm		0.04		c0.09		0.01						0.00
v/c Ratio		0.35		0.76	0.00	0.10	0.44	0.34		0.81	0.53	0.00
Uniform Delay, d1		52.7		55.8	51.0	51.5	62.8	12.6		51.1	5.9	3.5
Progression Factor		1.00		1.12	1.23	2.46	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.4		27.8	0.0	0.0	2.8	0.3		13.4	0.5	0.0
Delay (s)		53.1		90.4	62.6	126.7	65.6	12.8		64.5	6.4	3.5
Level of Service		D		F	E	F	E	B		E	A	A
Approach Delay (s)		53.1			119.7			13.7			12.9	
Approach LOS		D			F			B			B	

Intersection Summary			
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	65.2%	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 (vph)	50	280	429	337	809	240	617	986	350	251	1710	80
Future Volume (vph)	50	280	429	337	809	240	617	986	350	251	1710	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	5.0	5.0	5.5	5.5	5.0	5.5	5.5	5.0	5.5	
Lane Util. Factor	0.97	0.91	0.88	0.94	0.91	1.00	0.94	0.91	0.88	0.97	0.86	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3547	5255	2880	5157	5255	1636	5157	5255	2880	3547	6577	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3547	5255	2880	5157	5255	1636	5157	5255	2880	3547	6577	
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.92	0.95	0.95	0.95	0.96	0.96	0.96
Adj. Flow (vph)	53	295	452	366	879	261	649	1038	368	261	1781	83
RTOR Reduction (vph)	0	0	55	0	0	192	0	0	216	0	4	0
Lane Group Flow (vph)	53	295	397	366	879	69	649	1038	152	261	1860	0
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	3.9	20.1	42.3	16.1	32.8	32.8	22.2	51.5	51.5	15.7	45.0	
Effective Green, g (s)	3.9	20.1	42.3	16.1	32.8	32.8	22.2	51.5	51.5	15.7	45.0	
Actuated g/C Ratio	0.03	0.16	0.34	0.13	0.26	0.26	0.18	0.41	0.41	0.13	0.36	
Clearance Time (s)	5.0	6.0	5.0	5.0	5.5	5.5	5.0	5.5	5.5	5.0	5.5	
Vehicle Extension (s)	2.0	4.5	2.0	2.0	4.5	4.5	2.0	4.5	4.5	2.0	4.5	
Lane Grp Cap (vph)	110	845	975	664	1380	429	916	2166	1187	445	2369	
v/s Ratio Prot	0.01	0.06	0.07	c0.07	c0.17		c0.13	0.20		0.07	c0.28	
v/s Ratio Perm			0.07			0.04			0.05			
v/c Ratio	0.48	0.35	0.41	0.55	0.64	0.16	0.71	0.48	0.13	0.59	0.79	
Uniform Delay, d1	59.5	46.6	31.7	51.0	40.8	35.4	48.3	26.9	22.8	51.5	35.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	0.4	0.1	0.6	1.2	0.3	2.1	0.3	0.1	1.3	2.0	
Delay (s)	60.7	47.0	31.8	51.6	42.0	35.7	50.4	27.2	22.9	52.8	37.6	
Level of Service	E	D	C	D	D	D	D	C	C	D	D	
Approach Delay (s)		39.3			43.2			33.7			39.5	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	38.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	124.9	Sum of lost time (s)	21.5
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	494	885	1099	0	0	2156
Future Volume (vph)	494	885	1099	0	0	2156
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0			3.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	5255			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	5255			5255
Peak-hour factor, PHF	0.95	0.95	0.92	0.91	0.96	0.96
Adj. Flow (vph)	520	932	1195	0	0	2246
RTOR Reduction (vph)	0	60	0	0	0	0
Lane Group Flow (vph)	520	872	1195	0	0	2246
Turn Type	Prot	Prot	NA			NA
Protected Phases	4	4	2			6
Permitted Phases	4					
Actuated Green, G (s)	18.9	18.9	29.1			29.1
Effective Green, g (s)	21.9	21.9	32.1			32.1
Actuated g/C Ratio	0.36	0.36	0.54			0.54
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	5.0	5.0	5.0			1.8
Lane Grp Cap (vph)	1294	1051	2811			2811
v/s Ratio Prot	0.15	c0.30	0.23			c0.43
v/s Ratio Perm						
v/c Ratio	0.40	0.83	0.43			0.80
Uniform Delay, d1	14.2	17.3	8.4			11.3
Progression Factor	1.00	1.00	1.12			1.00
Incremental Delay, d2	0.4	6.2	0.4			2.5
Delay (s)	14.6	23.5	9.8			13.8
Level of Service	B	C	A			B
Approach Delay (s)	20.3		9.8			13.8
Approach LOS	C		A			B

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	635	1771	0	1254	1873	0
Future Volume (vph)	635	1771	0	1254	1873	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	
Lane Util. Factor	0.97	0.88		0.91	0.91	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3547	2880		5255	5255	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3547	2880		5255	5255	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	661	1845	0	1306	1951	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	661	1845	0	1306	1951	0
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases	4			2		
Actuated Green, G (s)	30.0	30.0		18.0	18.0	
Effective Green, g (s)	33.0	33.0		21.0	21.0	
Actuated g/C Ratio	0.55	0.55		0.35	0.35	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	1.8	1.8		5.0	5.0	
Lane Grp Cap (vph)	1950	1584		1839	1839	
v/s Ratio Prot	0.19	c0.64		0.25	c0.37	
v/s Ratio Perm						
v/c Ratio	0.34	1.16		0.71	1.06	
Uniform Delay, d1	7.5	13.5		16.9	19.5	
Progression Factor	1.00	1.00		1.00	0.74	
Incremental Delay, d2	0.0	81.3		2.4	37.4	
Delay (s)	7.5	94.8		19.2	51.8	
Level of Service	A	F		B	D	
Approach Delay (s)	71.8			19.2	51.8	
Approach LOS	E			B	D	

Intersection Summary			
HCM 2000 Control Delay	53.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	104.8%	ICU Level of Service	G
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 (vph)	6	799	164	48	1307	241	66	0	30	250	0	0
Future Volume (vph)	6	799	164	48	1307	241	66	0	30	250	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	6.0	6.0	4.5	6.0	6.0	4.1	5.0		4.1		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		0.97		
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95		
Satd. Flow (prot)	1829	5255	1636	1829	5255	1636	1829	1636		3547		
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95		
Satd. Flow (perm)	1829	5255	1636	1829	5255	1636	1829	1636		3547		
Peak-hour factor, PHF	0.90	0.93	0.93	0.92	0.92	0.92	0.92	0.90	0.92	0.92	0.90	0.90
Adj. Flow (vph)	7	859	176	52	1421	262	72	0	33	272	0	0
RTOR Reduction (vph)	0	0	66	0	0	86	0	29	0	0	0	0
Lane Group Flow (vph)	7	859	110	52	1421	176	72	4	0	272	0	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	1.4	81.5	81.5	6.9	87.4	87.4	8.7	14.7		7.3		
Effective Green, g (s)	1.4	81.5	81.5	6.9	87.4	87.4	8.7	14.7		7.3		
Actuated g/C Ratio	0.01	0.63	0.63	0.05	0.67	0.67	0.07	0.11		0.06		
Clearance Time (s)	4.1	6.0	6.0	4.5	6.0	6.0	4.1	5.0		4.1		
Vehicle Extension (s)	3.0	4.5	4.5	2.0	4.5	4.5	3.0	2.0		3.0		
Lane Grp Cap (vph)	19	3294	1025	97	3532	1099	122	184		199		
v/s Ratio Prot	0.00	0.16		c0.03	c0.27		0.04	c0.00		c0.08		
v/s Ratio Perm			0.07			0.11						
v/c Ratio	0.37	0.26	0.11	0.54	0.40	0.16	0.59	0.02		1.37		
Uniform Delay, d1	63.9	10.8	9.7	60.0	9.6	7.8	58.9	51.2		61.4		
Progression Factor	1.00	1.00	1.00	0.83	1.65	4.78	1.00	1.00		0.85		
Incremental Delay, d2	11.7	0.2	0.2	2.7	0.3	0.3	7.4	0.0		190.3		
Delay (s)	75.5	11.0	9.9	52.4	16.1	37.7	66.4	51.3		242.3		
Level of Service	E	B	A	D	B	D	E	D		F		
Approach Delay (s)		11.3			20.5			61.6			242.3	
Approach LOS		B			C			E			F	

Intersection Summary			
HCM 2000 Control Delay	37.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.6
Intersection Capacity Utilization	55.1%	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												
Traffic Volume (vph)	45	792	178	47	1236	0	146	0	68	0	0	0
Future Volume (vph)	45	792	178	47	1236	0	146	0	68	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0		4.5	4.5				
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		1.00	1.00				
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85				
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00				
Satd. Flow (prot)	3547	5255	1636	1829	5255		1829	1636				
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00				
Satd. Flow (perm)	3547	5255	1636	1829	5255		1829	1636				
Peak-hour factor, PHF	0.90	0.90	0.90	0.94	0.94	0.94	0.84	0.84	0.84	0.25	0.25	0.25
Adj. Flow (vph)	50	880	198	50	1315	0	174	0	81	0	0	0
RTOR Reduction (vph)	0	0	63	0	0	0	0	69	0	0	0	0
Lane Group Flow (vph)	50	880	135	50	1315	0	174	12	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	5.3	88.8	88.8	7.0	90.5		19.2	19.2				
Effective Green, g (s)	5.3	88.8	88.8	7.0	90.5		19.2	19.2				
Actuated g/C Ratio	0.04	0.68	0.68	0.05	0.70		0.15	0.15				
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0		4.5	4.5				
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5		2.0	2.0				
Lane Grp Cap (vph)	144	3589	1117	98	3658		270	241				
v/s Ratio Prot	0.01	0.17		c0.03	c0.25		c0.10	0.01				
v/s Ratio Perm			0.08									
v/c Ratio	0.35	0.25	0.12	0.51	0.36		0.64	0.05				
Uniform Delay, d1	60.7	7.8	7.1	59.8	8.0		52.2	47.6				
Progression Factor	0.82	1.07	3.46	1.24	0.62		1.00	1.00				
Incremental Delay, d2	0.5	0.1	0.2	1.8	0.3		3.9	0.0				
Delay (s)	50.4	8.5	24.8	76.3	5.2		56.1	47.6				
Level of Service	D	A	C	E	A		E	D				
Approach Delay (s)		13.3			7.8			53.4			0.0	
Approach LOS		B			A			D			A	

Intersection Summary			
HCM 2000 Control Delay	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	47.8%	ICU Level of Service	A
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 (vph)	0	803	174	72	1118	0	144	42	56	0	0	0
Future Volume (vph)	0	803	174	72	1118	0	144	42	56	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5	4.5	5.5		4.1	4.5				
Lane Util. Factor		0.91	1.00	1.00	0.91		0.97	1.00				
Frt		1.00	0.85	1.00	1.00		1.00	0.91				
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00				
Satd. Flow (prot)		5255	1636	1829	5255		3547	1760				
Flt Permitted		1.00	1.00	0.95	1.00		0.95	1.00				
Satd. Flow (perm)		5255	1636	1829	5255		3547	1760				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.90	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	0	873	189	78	1215	0	157	46	61	0	0	0
RTOR Reduction (vph)	0	0	71	0	0	0	0	42	0	0	0	0
Lane Group Flow (vph)	0	873	118	78	1215	0	157	65	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)		81.4	81.4	8.7	94.6		10.8	25.4				
Effective Green, g (s)		81.4	81.4	8.7	94.6		10.8	25.4				
Actuated g/C Ratio		0.63	0.63	0.07	0.73		0.08	0.20				
Clearance Time (s)		5.5	5.5	4.5	5.5		4.1	4.5				
Vehicle Extension (s)		4.5	4.5	2.0	4.5		3.0	2.0				
Lane Grp Cap (vph)		3290	1024	122	3824		294	343				
v/s Ratio Prot		0.17		c0.04	c0.23		c0.04	c0.04				
v/s Ratio Perm			0.07									
v/c Ratio		0.27	0.12	0.64	0.32		0.53	0.19				
Uniform Delay, d1		10.9	9.8	59.1	6.3		57.2	43.7				
Progression Factor		0.30	0.20	1.11	0.67		1.00	1.00				
Incremental Delay, d2		0.2	0.2	7.4	0.2		1.9	0.1				
Delay (s)		3.5	2.2	73.0	4.4		59.0	43.8				
Level of Service		A	A	E	A		E	D				
Approach Delay (s)		3.2			8.6			52.9			0.0	
Approach LOS		A			A			D			A	

Intersection Summary			
HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	43.2%	ICU Level of Service	A
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 (vph)	263	530	107	230	680	29	129	28	184	14	122	378
Future Volume (vph)	263	530	107	230	680	29	129	28	184	14	122	378
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5	5.5	4.5	5.5	5.5	4.5	5.0	5.0	4.5	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	1636	3547	5255	1636	3547	1925	1636	1829	1925	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	1636	3547	5255	1636	3547	1925	1636	1829	1925	1636
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	0.92	0.92	0.92	0.88	0.88	0.88
Adj. Flow (vph)	286	576	116	247	731	31	140	30	200	16	139	430
RTOR Reduction (vph)	0	0	59	0	0	16	0	0	154	0	0	320
Lane Group Flow (vph)	286	576	57	247	731	15	140	30	46	16	139	110
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	14.7	63.7	63.7	14.5	63.5	63.5	9.2	29.6	29.6	2.7	23.1	23.1
Effective Green, g (s)	14.7	63.7	63.7	14.5	63.5	63.5	9.2	29.6	29.6	2.7	23.1	23.1
Actuated g/C Ratio	0.11	0.49	0.49	0.11	0.49	0.49	0.07	0.23	0.23	0.02	0.18	0.18
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5	5.5	4.5	5.0	5.0	4.5	5.0	5.0
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5	4.5	2.0	4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)	401	2574	801	395	2566	799	251	438	372	37	342	290
v/s Ratio Prot	c0.08	0.11		c0.07	c0.14		c0.04	0.02		0.01	c0.07	
v/s Ratio Perm			0.03			0.01			0.03			0.07
v/c Ratio	0.71	0.22	0.07	0.63	0.28	0.02	0.56	0.07	0.12	0.43	0.41	0.38
Uniform Delay, d1	55.6	19.0	17.5	55.2	19.8	17.2	58.4	39.4	39.9	62.9	47.4	47.1
Progression Factor	0.84	1.37	3.53	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.9	0.2	0.2	2.2	0.3	0.0	1.5	0.1	0.2	2.9	1.1	1.1
Delay (s)	51.3	26.3	61.9	57.4	20.0	17.2	60.0	39.5	40.1	65.8	48.5	48.3
Level of Service	D	C	E	E	C	B	E	D	D	E	D	D
Approach Delay (s)		37.8			29.1			47.6			48.8	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	38.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	52.7%	ICU Level of Service	A
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 (vph)	0	0	0	130	0	0	0	205	55	8	384	0
Future Volume (vph)	0	0	0	130	0	0	0	205	55	8	384	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				3.0				3.0	3.1	3.0	3.0	
Lane Util. Factor				1.00				1.00	1.00	1.00	1.00	
Frt				1.00				1.00	0.85	1.00	1.00	
Flt Protected				0.95				1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1829				1925	1636	1829	1925	
Flt Permitted				0.95				1.00	1.00	0.95	1.00	
Satd. Flow (perm)				1829				1925	1636	1829	1925	
Peak-hour factor, PHF	0.90	0.90	0.90	0.82	0.90	0.82	0.90	0.88	0.88	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	159	0	0	0	233	62	9	427	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	22	0	0	0
Lane Group Flow (vph)	0	0	0	159	0	0	0	233	41	9	427	0
Turn Type	Prot			Prot			Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)				15.0				71.9	71.9	1.4	77.4	
Effective Green, g (s)				16.1				73.0	72.9	2.5	78.5	
Actuated g/C Ratio				0.14				0.66	0.66	0.02	0.71	
Clearance Time (s)				4.1				4.1	4.1	4.1	4.1	
Vehicle Extension (s)				3.0				3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				265				1264	1073	41	1360	
v/s Ratio Prot				c0.09				0.12		0.00	c0.22	
v/s Ratio Perm									0.03			
v/c Ratio				0.60				0.18	0.04	0.22	0.31	
Uniform Delay, d1				44.5				7.4	6.7	53.3	6.1	
Progression Factor				1.00				1.00	1.00	1.00	1.00	
Incremental Delay, d2				3.6				0.3	0.1	2.7	0.6	
Delay (s)				48.1				7.8	6.8	56.0	6.8	
Level of Service				D				A	A	E	A	
Approach Delay (s)		0.0			48.1			7.6			7.8	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	111.1	Sum of lost time (s)	15.3
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
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 (vph)	0	103	14	288	363	0	32	0	204	0	0	0
Future Volume (vph)	0	103	14	288	363	0	32	0	204	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.1	3.0	3.0		3.0		3.0			
Lane Util. Factor		0.95	1.00	1.00	0.95		1.00		1.00			
Frt		1.00	0.85	1.00	1.00		1.00		0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (prot)		3657	1636	1829	3657		1829		1636			
Flt Permitted		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (perm)		3657	1636	1829	3657		1829		1636			
Peak-hour factor, PHF	0.90	0.73	0.73	0.81	0.81	0.90	0.76	0.90	0.76	0.90	0.90	0.90
Adj. Flow (vph)	0	141	19	356	448	0	42	0	268	0	0	0
RTOR Reduction (vph)	0	0	14	0	0	0	0	0	183	0	0	0
Lane Group Flow (vph)	0	141	5	356	448	0	42	0	85	0	0	0
Turn Type		NA	Perm	Prot	NA		Prot		custom			
Protected Phases		4		3	8		2					
Permitted Phases			4						2			
Actuated Green, G (s)		15.9	15.9	19.3	39.3		20.5		20.5			
Effective Green, g (s)		17.0	16.9	20.4	40.4		21.6		21.6			
Actuated g/C Ratio		0.25	0.25	0.30	0.59		0.32		0.32			
Clearance Time (s)		4.1	4.1	4.1	4.1		4.1		4.1			
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0		3.0			
Lane Grp Cap (vph)		914	406	548	2172		580		519			
v/s Ratio Prot		0.04		c0.19	c0.12		0.02					
v/s Ratio Perm			0.00						c0.05			
v/c Ratio		0.15	0.01	0.65	0.21		0.07		0.16			
Uniform Delay, d1		19.9	19.3	20.7	6.4		16.2		16.7			
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00			
Incremental Delay, d2		0.1	0.0	2.7	0.0		0.2		0.7			
Delay (s)		20.0	19.3	23.4	6.4		16.4		17.4			
Level of Service		B	B	C	A		B		B			
Approach Delay (s)		19.9			13.9			17.3			0.0	
Approach LOS		B			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	68.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	32.6%	ICU Level of Service	A
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 (vph)	72	362	92	281	774	79	347	552	115	16	432	147
Future Volume (vph)	72	362	92	281	774	79	347	552	115	16	432	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0	5.0	4.5	6.0		5.0	6.0	6.0	4.5	5.5	5.5
Lane Util. Factor	0.97	0.91	0.88	0.97	0.91		0.94	0.91	0.88	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	2842	3547	5171		5157	5255	2819	3547	5255	1597
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	2842	3547	5171		5157	5255	2819	3547	5255	1597
Peak-hour factor, PHF	0.76	0.76	0.76	0.83	0.83	0.83	0.93	0.93	0.93	0.81	0.81	0.81
Adj. Flow (vph)	95	476	121	339	933	95	373	594	124	20	533	181
RTOR Reduction (vph)	0	0	43	0	6	0	0	0	98	0	0	151
Lane Group Flow (vph)	95	476	78	339	1022	0	373	594	26	20	533	30
Confl. Peds. (#/hr)			4			9			7			7
Confl. Bikes (#/hr)			1			1						3
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	8.0	61.5	77.3	16.5	70.0		15.8	28.4	28.4	10.1	22.7	22.7
Effective Green, g (s)	8.0	61.5	77.3	16.5	70.0		15.8	28.4	28.4	10.1	22.7	22.7
Actuated g/C Ratio	0.06	0.45	0.56	0.12	0.51		0.11	0.21	0.21	0.07	0.17	0.17
Clearance Time (s)	4.5	6.0	5.0	4.5	6.0		5.0	6.0	6.0	4.5	5.5	5.5
Vehicle Extension (s)	2.0	3.5	2.0	2.0	3.5		2.0	3.5	3.5	2.0	3.5	3.5
Lane Grp Cap (vph)	206	2350	1597	425	2632		592	1085	582	260	867	263
v/s Ratio Prot	0.03	0.09	0.01	c0.10	c0.20		c0.07	c0.11		0.01	0.10	
v/s Ratio Perm			0.02						0.01			0.02
v/c Ratio	0.46	0.20	0.05	0.80	0.39		0.63	0.55	0.04	0.08	0.61	0.11
Uniform Delay, d1	62.7	23.1	13.6	58.9	20.6		58.1	48.8	43.7	59.4	53.3	48.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.72	0.64	0.51	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.2	0.0	9.4	0.4		1.5	0.6	0.0	0.0	1.4	0.2
Delay (s)	63.3	23.3	13.6	68.3	21.1		43.1	32.0	22.5	59.4	54.7	49.1
Level of Service	E	C	B	E	C		D	C	C	E	D	D
Approach Delay (s)		27.1			32.8			34.7			53.4	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	36.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	137.5	Sum of lost time (s)	21.0
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
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 (vph)	6	8	390	81	16	12	570	1018	104	11	716	118
Future Volume (vph)	6	8	390	81	16	12	570	1018	104	11	716	118
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.1	4.1	4.1		4.1	4.1	4.1	4.1	4.1	
Lane Util. Factor	1.00	0.91	0.91	0.97	1.00		0.94	0.91	1.00	0.97	0.86	
Frt	1.00	0.86	0.85	1.00	0.94		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1829	1505	2978	3547	1804		5157	5255	1636	3547	6481	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1829	1505	2978	3547	1804		5157	5255	1636	3547	6481	
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.90	0.90	0.97	0.97	0.97	0.86	0.92	0.92
Adj. Flow (vph)	7	9	424	90	18	13	588	1049	107	13	778	128
RTOR Reduction (vph)	0	102	216	0	9	0	0	0	42	0	17	0
Lane Group Flow (vph)	7	43	72	90	22	0	588	1049	65	13	889	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	1.6	34.2	34.2	8.0	40.6		20.0	75.7	83.7	3.2	58.9	
Effective Green, g (s)	1.6	34.2	34.2	8.0	40.6		20.0	75.7	83.7	3.2	58.9	
Actuated g/C Ratio	0.01	0.25	0.25	0.06	0.30		0.15	0.55	0.61	0.02	0.43	
Clearance Time (s)	4.1	4.1	4.1	4.1	4.1		4.1	4.1	4.1	4.1	4.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	21	374	740	206	532		750	2893	1044	82	2776	
v/s Ratio Prot	0.00	c0.03		c0.03	0.01		c0.11	c0.20	0.00	0.00	0.14	
v/s Ratio Perm			0.02						0.04			
v/c Ratio	0.33	0.11	0.10	0.44	0.04		0.78	0.36	0.06	0.16	0.32	
Uniform Delay, d1	67.4	39.9	39.8	62.6	34.6		56.7	17.4	10.9	65.8	26.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.08	0.85	
Incremental Delay, d2	9.1	0.1	0.1	1.5	0.0		5.4	0.4	0.0	0.8	0.3	
Delay (s)	76.6	40.1	39.8	64.1	34.6		62.0	17.7	11.0	71.9	22.5	
Level of Service	E	D	D	E	C		E	B	B	E	C	
Approach Delay (s)		40.5			56.5			32.2			23.2	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	31.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	137.5	Sum of lost time (s)	16.4
Intersection Capacity Utilization	45.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	503	553	1139	0	0	816
Future Volume (vph)	503	553	1139	0	0	816
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.5	1.5	2.0			2.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frpb, ped/bikes	1.00	1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	5255			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	5255			5255
Peak-hour factor, PHF	0.95	0.95	0.93	0.93	0.88	0.88
Adj. Flow (vph)	529	582	1225	0	0	927
RTOR Reduction (vph)	0	100	0	0	0	0
Lane Group Flow (vph)	529	482	1225	0	0	927
Confl. Peds. (#/hr)				3		
Confl. Bikes (#/hr)				1		
Turn Type	Prot	Prot	NA			NA
Protected Phases	8	8	2			6
Permitted Phases						
Actuated Green, G (s)	11.1	11.1	18.8			18.8
Effective Green, g (s)	14.1	14.1	21.8			21.8
Actuated g/C Ratio	0.36	0.36	0.55			0.55
Clearance Time (s)	4.5	4.5	5.0			5.0
Vehicle Extension (s)	2.0	2.0	3.5			3.5
Lane Grp Cap (vph)	1269	1030	2907			2907
v/s Ratio Prot	0.15	c0.17	c0.23			0.18
v/s Ratio Perm						
v/c Ratio	0.42	0.47	0.42			0.32
Uniform Delay, d1	9.5	9.8	5.1			4.8
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.1	0.1	0.1			0.1
Delay (s)	9.6	9.9	5.2			4.8
Level of Service	A	A	A			A
Approach Delay (s)	9.8		5.2			4.8
Approach LOS	A		A			A

Intersection Summary			
HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	39.4	Sum of lost time (s)	3.5
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	837	959	0	462	1201	0
Future Volume (vph)	837	959	0	462	1201	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.5	1.5		2.0	2.1	
Lane Util. Factor	0.97	0.88		0.91	0.91	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3547	2880		5255	5255	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3547	2880		5255	5255	
Peak-hour factor, PHF	0.96	0.96	0.90	0.90	0.90	0.90
Adj. Flow (vph)	872	999	0	513	1334	0
RTOR Reduction (vph)	0	50	0	0	0	0
Lane Group Flow (vph)	872	949	0	513	1334	0
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases	4					
Actuated Green, G (s)	19.8	19.8		22.2	22.2	
Effective Green, g (s)	22.8	22.8		25.2	25.1	
Actuated g/C Ratio	0.44	0.44		0.49	0.49	
Clearance Time (s)	4.5	4.5		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		3.5	3.5	
Lane Grp Cap (vph)	1570	1275		2571	2561	
v/s Ratio Prot	0.25	c0.33		0.10	c0.25	
v/s Ratio Perm						
v/c Ratio	0.56	0.74		0.20	0.52	
Uniform Delay, d1	10.6	11.9		7.4	9.1	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	2.1		0.0	0.2	
Delay (s)	10.8	14.0		7.5	9.3	
Level of Service	B	B		A	A	
Approach Delay (s)	12.5			7.5	9.3	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	51.5	Sum of lost time (s)	3.6
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
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 (vph)	93	392	15	40	932	23	28	7	7	23	23	172
Future Volume (vph)	93	392	15	40	932	23	28	7	7	23	23	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1829	5255	1636	3547	5236		1829	1925	1636	1829	1925	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1829	5255	1636	3547	5236		1829	1925	1636	1829	1925	1636
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	103	436	17	44	1036	26	31	8	8	26	26	191
RTOR Reduction (vph)	0	0	7	0	1	0	0	0	7	0	0	166
Lane Group Flow (vph)	103	436	10	44	1061	0	31	8	1	26	26	25
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	10.8	65.3	65.3	4.4	58.9		4.7	15.6	15.6	3.2	14.1	14.1
Effective Green, g (s)	10.8	65.3	65.3	4.4	58.9		4.7	15.6	15.6	3.2	14.1	14.1
Actuated g/C Ratio	0.10	0.62	0.62	0.04	0.56		0.04	0.15	0.15	0.03	0.13	0.13
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	186	3237	1007	147	2909		81	283	240	55	256	217
v/s Ratio Prot	c0.06	0.08		0.01	c0.20		c0.02	0.00		0.01	0.01	
v/s Ratio Perm			0.01						0.00			c0.02
v/c Ratio	0.55	0.13	0.01	0.30	0.36		0.38	0.03	0.00	0.47	0.10	0.12
Uniform Delay, d1	45.3	8.5	7.9	49.3	13.1		49.2	38.7	38.6	50.6	40.4	40.5
Progression Factor	1.00	1.00	1.00	1.19	0.63		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.5	0.1	0.0	1.1	0.3		3.0	0.0	0.0	6.3	0.2	0.2
Delay (s)	48.8	8.6	7.9	59.6	8.6		52.2	38.7	38.6	56.9	40.6	40.7
Level of Service	D	A	A	E	A		D	D	D	E	D	D
Approach Delay (s)		16.0			10.6			47.6			42.4	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	106.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	43.8%	ICU Level of Service	A
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 (vph)	6	414	61	115	906	5	46	0	34	14	0	18
Future Volume (vph)	6	414	61	115	906	5	46	0	34	14	0	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.91		0.97	0.91			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.98	
Satd. Flow (prot)	1829	5153		3547	5250			1829	1636		1742	
Flt Permitted	0.95	1.00		0.95	1.00			0.83	1.00		0.88	
Satd. Flow (perm)	1829	5153		3547	5250			1588	1636		1572	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	460	68	128	1007	6	51	0	38	16	0	20
RTOR Reduction (vph)	0	10	0	0	0	0	0	0	33	0	31	0
Lane Group Flow (vph)	7	518	0	128	1013	0	0	51	5	0	5	0
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	1.4	69.2		9.2	77.0			14.1	14.1		14.1	
Effective Green, g (s)	1.4	69.2		9.2	77.0			14.1	14.1		14.1	
Actuated g/C Ratio	0.01	0.65		0.09	0.73			0.13	0.13		0.13	
Clearance Time (s)	4.0	5.5		4.0	5.5			4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	24	3364		307	3813			211	217		209	
v/s Ratio Prot	0.00	0.10		c0.04	c0.19							
v/s Ratio Perm								c0.03	0.00		0.00	
v/c Ratio	0.29	0.15		0.42	0.27			0.24	0.02		0.02	
Uniform Delay, d1	51.8	7.1		45.9	4.9			41.2	40.0		40.0	
Progression Factor	1.22	0.56		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	6.6	0.1		0.9	0.2			0.6	0.0		0.0	
Delay (s)	69.7	4.1		46.8	5.1			41.8	40.0		40.0	
Level of Service	E	A		D	A			D	D		D	
Approach Delay (s)		4.9			9.8			41.0			40.0	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	106.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	40.7%	ICU Level of Service	A
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 (vph)	106	131	210	460	479	31	408	770	189	34	1183	152
Future Volume (vph)	106	131	210	460	479	31	408	770	189	34	1183	152
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	5.0	5.0	6.0		5.0	6.0	5.0	5.0	6.0	6.0
Lane Util. Factor	0.97	0.91	0.88	0.94	0.91		0.94	0.91	0.88	0.97	0.86	0.88
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	2880	5157	5207		5157	5255	2880	3547	6621	2880
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	2880	5157	5207		5157	5255	2880	3547	6621	2880
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	115	142	228	500	521	34	434	819	201	37	1286	165
RTOR Reduction (vph)	0	0	56	0	5	0	0	0	92	0	0	105
Lane Group Flow (vph)	115	142	172	500	550	0	434	819	109	37	1286	60
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8	1	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	16.1	17.2	33.6	16.7	17.8		16.4	39.7	56.4	8.6	31.9	31.9
Effective Green, g (s)	16.1	17.2	33.6	16.7	17.8		16.4	39.7	56.4	8.6	31.9	31.9
Actuated g/C Ratio	0.15	0.17	0.32	0.16	0.17		0.16	0.38	0.54	0.08	0.31	0.31
Clearance Time (s)	5.0	6.0	5.0	5.0	6.0		5.0	6.0	5.0	5.0	6.0	6.0
Vehicle Extension (s)	2.0	3.0	2.0	2.0	3.0		2.0	4.0	2.0	2.0	4.0	4.0
Lane Grp Cap (vph)	548	867	928	826	889		811	2002	1558	292	2026	881
v/s Ratio Prot	0.03	0.03	0.03	c0.10	c0.11		c0.08	0.16	0.01	0.01	c0.19	
v/s Ratio Perm			0.03						0.03			0.02
v/c Ratio	0.21	0.16	0.19	0.61	0.62		0.54	0.41	0.07	0.13	0.63	0.07
Uniform Delay, d1	38.5	37.3	25.4	40.7	40.1		40.4	23.6	11.4	44.3	31.1	25.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.1	0.0	0.9	1.3		0.3	0.2	0.0	0.1	0.7	0.0
Delay (s)	38.6	37.4	25.5	41.6	41.3		40.7	23.8	11.4	44.4	31.9	25.7
Level of Service	D	D	C	D	D		D	C	B	D	C	C
Approach Delay (s)		32.1			41.4			27.2			31.5	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	104.2	Sum of lost time (s)	22.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	541	255	1361	0	0	1179
Future Volume (vph)	541	255	1361	0	0	1179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.1	2.1	2.0			2.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	5255			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	5255			5255
Peak-hour factor, PHF	0.96	0.96	0.94	0.94	0.90	0.90
Adj. Flow (vph)	564	266	1448	0	0	1310
RTOR Reduction (vph)	0	41	0	0	0	0
Lane Group Flow (vph)	564	225	1448	0	0	1310
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		6			2
Permitted Phases	4	4				
Actuated Green, G (s)	12.0	12.0	21.4			21.4
Effective Green, g (s)	14.0	14.0	24.4			24.4
Actuated g/C Ratio	0.33	0.33	0.57			0.57
Clearance Time (s)	4.1	4.1	5.0			5.0
Vehicle Extension (s)	3.0	3.0	3.5			3.5
Lane Grp Cap (vph)	1168	948	3016			3016
v/s Ratio Prot	c0.16		c0.28			0.25
v/s Ratio Perm		0.08				
v/c Ratio	0.48	0.24	0.48			0.43
Uniform Delay, d1	11.4	10.4	5.3			5.1
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.3	0.1	0.1			0.1
Delay (s)	11.7	10.5	5.5			5.3
Level of Service	B	B	A			A
Approach Delay (s)	11.3		5.5			5.3
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	42.5	Sum of lost time (s)	6.5
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
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 (vph)	676	153	745	185	0	346	0	920	94	165	1067	0
Future Volume (vph)	676	153	745	185	0	346	0	920	94	165	1067	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5		4.5		5.0	5.0	4.5	5.0	
Lane Util. Factor	0.97	1.00	1.00	0.97		0.88		0.91	1.00	0.97	0.95	
Frt	1.00	1.00	0.85	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3547	1925	1636	3547		2880		5255	1636	3547	3657	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3547	1925	1636	3547		2880		5255	1636	3547	3657	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.91	0.91	0.91	0.94	0.94	0.94
Adj. Flow (vph)	727	165	801	199	0	372	0	1011	103	176	1135	0
RTOR Reduction (vph)	0	0	63	0	0	0	0	0	76	0	0	0
Lane Group Flow (vph)	727	165	738	199	0	372	0	1011	27	176	1135	0
Turn Type	Split	NA	Perm	Prot		pt+ov		NA	Perm	Prot	NA	
Protected Phases	4	4		8		1 8		2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	40.6	40.6	40.6	8.1		21.6		26.6	26.6	9.0	40.1	
Effective Green, g (s)	40.6	40.6	40.6	8.1		21.6		26.6	26.6	9.0	40.1	
Actuated g/C Ratio	0.39	0.39	0.39	0.08		0.21		0.26	0.26	0.09	0.39	
Clearance Time (s)	4.5	4.5	4.5	4.5				5.0	5.0	4.5	5.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0				3.5	3.5	2.0	3.5	
Lane Grp Cap (vph)	1400	760	646	279		605		1359	423	310	1426	
v/s Ratio Prot	0.20	0.09		0.06		c0.13		0.19		0.05	c0.31	
v/s Ratio Perm			c0.45						0.02			
v/c Ratio	0.52	0.22	1.14	0.71		0.61		0.74	0.06	0.57	0.80	
Uniform Delay, d1	23.7	20.6	31.1	46.2		36.8		35.0	28.7	45.0	27.7	
Progression Factor	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.1	81.7	7.0		1.3		2.3	0.1	1.4	3.3	
Delay (s)	23.8	20.6	112.8	53.2		38.1		37.3	28.8	46.5	31.0	
Level of Service	C	C	F	D		D		D	C	D	C	
Approach Delay (s)		65.6			43.4			36.5			33.1	
Approach LOS		E			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	46.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	102.8	Sum of lost time (s)	18.5
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
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 (vph)	77	178	103	105	322	157	11	107	23	39	334	81
Future Volume (vph)	77	178	103	105	322	157	11	107	23	39	334	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1		4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	
Lane Util. Factor	1.00	1.00		0.97	0.95	1.00	1.00	0.91	0.91	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1829	1810		3547	3657	1611	1829	3494	1489	1829	3550	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1829	1810		3547	3657	1611	1829	3494	1489	1829	3550	
Peak-hour factor, PHF	0.78	0.78	0.78	0.68	0.68	0.68	0.97	0.97	0.97	0.81	0.81	0.81
Adj. Flow (vph)	99	228	132	154	474	231	11	110	24	48	412	100
RTOR Reduction (vph)	0	22	0	0	0	172	0	1	12	0	17	0
Lane Group Flow (vph)	99	338	0	154	474	59	11	111	10	48	495	0
Confl. Peds. (#/hr)			1			2						
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	6.9	22.8		9.6	25.5	25.5	1.4	46.6	46.6	4.6	49.8	
Effective Green, g (s)	6.9	22.8		9.6	25.5	25.5	1.4	46.6	46.6	4.6	49.8	
Actuated g/C Ratio	0.07	0.23		0.10	0.26	0.26	0.01	0.47	0.47	0.05	0.50	
Clearance Time (s)	4.1	4.1		4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	126	412		340	932	410	25	1628	693	84	1767	
v/s Ratio Prot	c0.05	c0.19		0.04	c0.13		0.01	0.03		c0.03	c0.14	
v/s Ratio Perm						0.04			0.01			
v/c Ratio	0.79	0.82		0.45	0.51	0.14	0.44	0.07	0.01	0.57	0.28	
Uniform Delay, d1	45.8	36.6		42.7	31.9	28.8	48.9	14.7	14.4	46.7	14.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	26.7	12.0		1.0	0.4	0.2	11.9	0.1	0.0	9.1	0.4	
Delay (s)	72.6	48.7		43.7	32.3	29.0	60.8	14.8	14.4	55.8	15.0	
Level of Service	E	D		D	C	C	E	B	B	E	B	
Approach Delay (s)		53.8			33.5			18.2			18.5	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	32.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	42.1%	ICU Level of Service	A
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		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	78	0	0	214	8	46	2	118	20	88	246	3
Future Volume (vph)	78	0	0	214	8	46	2	118	20	88	246	3
Peak Hour Factor	0.25	0.25	0.25	0.77	0.77	0.77	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	312	0	0	278	10	60	2	139	24	104	289	4

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total (vph)	312	288	60	72	94	397
Volume Left (vph)	312	278	0	2	0	104
Volume Right (vph)	0	0	60	0	24	4
Hadj (s)	0.23	0.23	-0.57	0.05	-0.15	0.08
Departure Headway (s)	6.8	6.8	3.2	7.6	7.4	6.6
Degree Utilization, x	0.59	0.55	0.05	0.15	0.19	0.72
Capacity (veh/h)	491	482	1121	404	412	524
Control Delay (s)	18.9	17.7	6.4	10.7	10.9	24.9
Approach Delay (s)	18.9	15.7		10.8		24.9
Approach LOS	C	C		B		C

Intersection Summary			
Delay	18.8		
Level of Service	C		
Intersection Capacity Utilization	47.0%	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)	126	188	29	134	529	314	29	179	86	646	953	748
Future Volume (vph)	126	188	29	134	529	314	29	179	86	646	953	748
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	1636	3547	5255	1636	3547	5255	1636	3547	5255	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	1636	3547	5255	1636	3547	5255	1636	3547	5255	1636
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.87	0.92	0.93
Adj. Flow (vph)	148	221	34	158	622	369	34	211	101	743	1036	804
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	148	221	34	158	622	369	34	211	101	743	1036	804
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			Free			Free			Free			Free
Actuated Green, G (s)	7.2	17.1	79.3	7.2	17.1	79.3	2.2	17.1	79.3	17.9	32.8	79.3
Effective Green, g (s)	8.2	20.1	79.3	8.2	20.1	79.3	3.2	20.1	79.3	18.9	35.8	79.3
Actuated g/C Ratio	0.10	0.25	1.00	0.10	0.25	1.00	0.04	0.25	1.00	0.24	0.45	1.00
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	366	1331	1636	366	1331	1636	143	1331	1636	845	2372	1636
v/s Ratio Prot	0.04	0.04		0.04	0.12		0.01	0.04		c0.21	0.20	
v/s Ratio Perm			0.02			0.23			0.06			c0.49
v/c Ratio	0.40	0.17	0.02	0.43	0.47	0.23	0.24	0.16	0.06	0.88	0.44	0.49
Uniform Delay, d1	33.3	23.1	0.0	33.4	25.1	0.0	36.9	23.0	0.0	29.1	14.9	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.1	0.0	0.8	0.3	0.3	0.9	0.1	0.1	10.3	0.1	1.1
Delay (s)	34.0	23.1	0.0	34.2	25.3	0.3	37.7	23.1	0.1	39.4	15.0	1.1
Level of Service	C	C	A	C	C	A	D	C	A	D	B	A
Approach Delay (s)		25.2			18.5			17.8			17.7	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	79.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
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 (vph)	10	21	40	57	0	776	86	1926	15	221	1541	32
Future Volume (vph)	10	21	40	57	0	776	86	1926	15	221	1541	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5		4.0		4.0	3.5	5.0		3.5	5.0	5.0
Lane Util. Factor		1.00		1.00		0.88	1.00	0.91		1.00	0.95	1.00
Frt		0.92		1.00		0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected		0.99		0.95		1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1766		1829		2880	1829	5249		1829	3657	1636
Flt Permitted		0.97		0.54		1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1723		1033		2880	1829	5249		1829	3657	1636
Peak-hour factor, PHF	0.60	0.60	0.60	0.92	0.92	0.92	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	17	35	67	62	0	843	92	2071	16	240	1675	35
RTOR Reduction (vph)	0	39	0	0	0	413	0	0	0	0	0	12
Lane Group Flow (vph)	0	80	0	62	0	430	92	2087	0	240	1675	23
Turn Type	Perm	NA		Perm		Perm	Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						6
Actuated Green, G (s)		23.7		23.2		23.2	10.0	73.9		20.4	84.3	84.3
Effective Green, g (s)		23.7		23.2		23.2	10.0	73.9		20.4	84.3	84.3
Actuated g/C Ratio		0.18		0.18		0.18	0.08	0.57		0.16	0.65	0.65
Clearance Time (s)		3.5		4.0		4.0	3.5	5.0		3.5	5.0	5.0
Vehicle Extension (s)		2.0		2.0		2.0	2.0	4.0		2.0	4.0	4.0
Lane Grp Cap (vph)		314		184		513	140	2983		287	2371	1060
v/s Ratio Prot							0.05	0.40		c0.13	c0.46	
v/s Ratio Perm		0.05		0.06		c0.15						0.01
v/c Ratio		0.25		0.34		0.84	0.66	0.70		0.84	0.71	0.02
Uniform Delay, d1		45.6		46.7		51.6	58.3	20.1		53.2	14.8	8.1
Progression Factor		1.00		0.97		1.01	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.2		0.3		9.4	8.2	1.4		17.9	1.1	0.0
Delay (s)		45.7		45.5		61.7	66.5	21.5		71.1	15.9	8.2
Level of Service		D		D		E	E	C		E	B	A
Approach Delay (s)		45.7			60.6			23.4			22.5	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
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 (vph)	188	1014	799	774	1384	524	926	1766	425	330	1292	113
Future Volume (vph)	188	1014	799	774	1384	524	926	1766	425	330	1292	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	5.0	5.0	5.5	5.5	5.0	5.5	5.5	5.0	5.5	
Lane Util. Factor	0.97	0.91	0.88	0.94	0.91	1.00	0.94	0.91	0.88	0.97	0.86	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3547	5255	2880	5157	5255	1636	5157	5255	2880	3547	6541	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3547	5255	2880	5157	5255	1636	5157	5255	2880	3547	6541	
Peak-hour factor, PHF	0.92	0.92	0.92	0.97	0.97	0.97	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	204	1102	868	798	1427	540	955	1821	438	359	1404	123
RTOR Reduction (vph)	0	0	47	0	0	159	0	0	274	0	8	0
Lane Group Flow (vph)	204	1102	821	798	1427	381	955	1821	164	359	1519	0
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	11.6	37.3	70.5	26.6	52.8	52.8	33.2	59.0	59.0	17.8	43.6	
Effective Green, g (s)	11.6	37.3	70.5	26.6	52.8	52.8	33.2	59.0	59.0	17.8	43.6	
Actuated g/C Ratio	0.07	0.23	0.43	0.16	0.33	0.33	0.20	0.36	0.36	0.11	0.27	
Clearance Time (s)	5.0	6.0	5.0	5.0	5.5	5.5	5.0	5.5	5.5	5.0	5.5	
Vehicle Extension (s)	2.0	4.5	2.0	2.0	4.5	4.5	2.0	4.5	4.5	2.0	4.5	
Lane Grp Cap (vph)	253	1208	1251	845	1710	532	1055	1911	1047	389	1758	
v/s Ratio Prot	0.06	c0.21	0.13	c0.15	0.27		c0.19	c0.35		0.10	0.23	
v/s Ratio Perm			0.15			0.23			0.06			
v/c Ratio	0.81	0.91	0.66	0.94	0.83	0.72	0.91	0.95	0.16	0.92	0.86	
Uniform Delay, d1	74.2	60.9	36.3	67.1	50.7	48.1	63.0	50.2	34.8	71.5	56.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	16.0	10.8	1.0	18.5	4.0	5.2	10.7	11.6	0.1	26.8	5.0	
Delay (s)	90.2	71.7	37.2	85.6	54.7	53.3	73.6	61.8	34.9	98.3	61.5	
Level of Service	F	E	D	F	D	D	E	E	C	F	E	
Approach Delay (s)		59.7			63.3			61.7			68.5	
Approach LOS		E			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	63.0	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	162.2	Sum of lost time (s)	21.5
Intersection Capacity Utilization	98.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	381	891	2278	0	0	1731
Future Volume (vph)	381	891	2278	0	0	1731
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0			3.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	5255			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	5255			5255
Peak-hour factor, PHF	0.92	0.92	0.96	0.96	0.95	0.97
Adj. Flow (vph)	414	968	2373	0	0	1785
RTOR Reduction (vph)	0	2	0	0	0	0
Lane Group Flow (vph)	414	966	2373	0	0	1785
Turn Type	Prot	Prot	NA			NA
Protected Phases	4	4	2			6
Permitted Phases	4					
Actuated Green, G (s)	20.0	20.0	28.0			28.0
Effective Green, g (s)	23.0	23.0	31.0			31.0
Actuated g/C Ratio	0.38	0.38	0.52			0.52
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	5.0	5.0	5.0			1.8
Lane Grp Cap (vph)	1359	1104	2715			2715
v/s Ratio Prot	0.12	c0.34	c0.45			0.34
v/s Ratio Perm						
v/c Ratio	0.30	0.88	0.87			0.66
Uniform Delay, d1	12.9	17.2	12.8			10.6
Progression Factor	1.00	1.00	0.80			1.00
Incremental Delay, d2	0.3	8.6	1.7			1.3
Delay (s)	13.2	25.7	11.9			11.9
Level of Service	B	C	B			B
Approach Delay (s)	22.0		11.9			11.9
Approach LOS	C		B			B

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	152.1%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1321	1082	0	2610	1758	0
Future Volume (vph)	1321	1082	0	2610	1758	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	
Lane Util. Factor	0.97	0.88		0.91	0.91	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3547	2880		5255	5255	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3547	2880		5255	5255	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1405	1151	0	2777	1870	0
RTOR Reduction (vph)	0	3	0	0	0	0
Lane Group Flow (vph)	1405	1148	0	2777	1870	0
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases	4			2		
Actuated Green, G (s)	24.0	24.0		24.0	24.0	
Effective Green, g (s)	27.0	27.0		27.0	27.0	
Actuated g/C Ratio	0.45	0.45		0.45	0.45	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	1.8	1.8		5.0	5.0	
Lane Grp Cap (vph)	1596	1296		2364	2364	
v/s Ratio Prot	0.40	c0.40		c0.53	0.36	
v/s Ratio Perm						
v/c Ratio	0.88	0.89		1.17	0.79	
Uniform Delay, d1	15.0	15.1		16.5	14.1	
Progression Factor	1.00	1.00		1.00	1.62	
Incremental Delay, d2	5.9	7.4		83.4	2.5	
Delay (s)	20.9	22.5		99.9	25.4	
Level of Service	C	C		F	C	
Approach Delay (s)	21.6			99.9	25.4	
Approach LOS	C			F	C	

Intersection Summary			
HCM 2000 Control Delay	52.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	138.4%	ICU Level of Service	H
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 (vph)	14	2094	27	59	2549	750	95	0	57	250	0	20
Future Volume (vph)	14	2094	27	59	2549	750	95	0	57	250	0	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.9	5.0	3.4	4.9	6.0	3.0	5.0		4.1	4.1	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1829	5255	1636	1829	5255	1636	1829	1636		3547	1636	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1829	5255	1636	1829	5255	1636	1829	1636		3547	1636	
Peak-hour factor, PHF	0.90	0.97	0.89	0.92	0.97	0.92	0.77	0.90	0.77	0.92	0.90	0.90
Adj. Flow (vph)	16	2159	30	64	2628	815	123	0	74	272	0	22
RTOR Reduction (vph)	0	0	13	0	0	305	0	64	0	0	20	0
Lane Group Flow (vph)	16	2159	17	64	2628	510	123	10	0	272	2	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	2.8	71.6	71.6	12.6	81.4	81.4	14.7	17.3		8.9	12.4	
Effective Green, g (s)	2.8	72.7	72.6	13.7	82.5	81.4	15.8	17.3		8.9	12.4	
Actuated g/C Ratio	0.02	0.56	0.56	0.11	0.63	0.63	0.12	0.13		0.07	0.10	
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0	6.0	4.1	5.0		4.1	4.1	
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5	4.5	3.0	4.5		3.0	3.0	
Lane Grp Cap (vph)	39	2938	913	192	3334	1024	222	217		242	156	
v/s Ratio Prot	0.01	c0.41		0.03	c0.50		c0.07	c0.01		c0.08	0.00	
v/s Ratio Perm			0.01			0.31						
v/c Ratio	0.41	0.73	0.02	0.33	0.79	0.50	0.55	0.05		1.12	0.01	
Uniform Delay, d1	62.8	21.4	12.8	53.9	17.4	13.2	53.8	49.1		60.5	53.3	
Progression Factor	1.00	1.00	1.00	0.98	0.98	2.33	1.00	1.00		1.10	1.00	
Incremental Delay, d2	2.5	1.7	0.0	0.2	1.1	1.0	3.0	0.1		88.5	0.0	
Delay (s)	65.3	23.1	12.8	52.8	18.2	31.7	56.8	49.3		154.8	53.3	
Level of Service	E	C	B	D	B	C	E	D		F	D	
Approach Delay (s)		23.3			22.0			54.0			147.2	
Approach LOS		C			C			D			F	

Intersection Summary			
HCM 2000 Control Delay	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	70.5%	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 (vph)	17	1977	209	103	3244	0	114	0	68	0	0	0
Future Volume (vph)	17	1977	209	103	3244	0	114	0	68	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0		4.5	4.5				
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		1.00	1.00				
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85				
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00				
Satd. Flow (prot)	3547	5255	1636	1829	5255		1829	1636				
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00				
Satd. Flow (perm)	3547	5255	1636	1829	5255		1829	1636				
Peak-hour factor, PHF	0.91	0.97	0.92	0.94	0.97	0.94	0.92	0.92	0.92	0.25	0.25	0.25
Adj. Flow (vph)	19	2038	227	110	3344	0	124	0	74	0	0	0
RTOR Reduction (vph)	0	0	49	0	0	0	0	66	0	0	0	0
Lane Group Flow (vph)	19	2038	178	110	3344	0	124	8	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	2.3	87.9	87.9	13.7	99.3		13.4	13.4				
Effective Green, g (s)	2.3	87.9	87.9	13.7	99.3		13.4	13.4				
Actuated g/C Ratio	0.02	0.68	0.68	0.11	0.76		0.10	0.10				
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0		4.5	4.5				
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5		2.0	2.0				
Lane Grp Cap (vph)	62	3553	1106	192	4014		188	168				
v/s Ratio Prot	0.01	0.39		c0.06	c0.64		c0.07	0.00				
v/s Ratio Perm			0.11									
v/c Ratio	0.31	0.57	0.16	0.57	0.83		0.66	0.05				
Uniform Delay, d1	63.1	11.1	7.6	55.4	10.0		56.1	52.5				
Progression Factor	1.01	0.52	0.58	0.95	0.85		1.00	1.00				
Incremental Delay, d2	0.7	0.5	0.2	1.1	1.0		6.2	0.0				
Delay (s)	64.1	6.3	4.6	53.8	9.5		62.3	52.6				
Level of Service	E	A	A	D	A		E	D				
Approach Delay (s)		6.6			10.9			58.7			0.0	
Approach LOS		A			B			E			A	

Intersection Summary			
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
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 (vph)	10	1838	212	149	2510	10	727	0	71	40	10	110
Future Volume (vph)	10	1838	212	149	2510	10	727	0	71	40	10	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	5.5	5.5	4.5	5.5	5.5	4.1	4.5		4.1	4.1	4.1
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1829	5255	1636	1829	5255	1636	3547	1636		1829	1925	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1829	5255	1636	1829	5255	1636	3547	1636		1829	1925	1636
Peak-hour factor, PHF	0.92	0.97	0.94	0.93	0.97	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	1895	226	160	2588	11	790	0	77	43	11	120
RTOR Reduction (vph)	0	0	87	0	0	5	0	56	0	0	0	108
Lane Group Flow (vph)	11	1895	139	160	2588	6	790	21	0	43	11	12
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	1.4	56.6	56.6	13.6	69.2	69.2	28.9	35.0		6.2	12.7	12.7
Effective Green, g (s)	1.4	56.6	56.6	13.6	69.2	69.2	28.9	35.0		6.2	12.7	12.7
Actuated g/C Ratio	0.01	0.44	0.44	0.10	0.53	0.53	0.22	0.27		0.05	0.10	0.10
Clearance Time (s)	4.1	5.5	5.5	4.5	5.5	5.5	4.1	4.5		4.1	4.1	4.1
Vehicle Extension (s)	3.0	4.5	4.5	2.0	4.5	4.5	3.0	2.0		3.0	3.0	3.0
Lane Grp Cap (vph)	19	2287	712	191	2797	870	788	440		87	188	159
v/s Ratio Prot	0.01	0.36		c0.09	c0.49		c0.22	0.01		0.02	0.01	
v/s Ratio Perm			0.08			0.00						c0.01
v/c Ratio	0.58	0.83	0.20	0.84	0.93	0.01	1.00	0.05		0.49	0.06	0.07
Uniform Delay, d1	64.0	32.4	22.6	57.1	28.0	14.3	50.5	35.2		60.4	53.2	53.3
Progression Factor	1.37	0.49	0.29	1.14	0.70	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	31.3	3.1	0.5	14.3	3.6	0.0	32.7	0.0		4.4	0.1	0.2
Delay (s)	119.0	19.0	7.1	79.4	23.1	14.3	83.2	35.2		64.7	53.4	53.5
Level of Service	F	B	A	E	C	B	F	D		E	D	D
Approach Delay (s)		18.2			26.4			79.0			56.3	
Approach LOS		B			C			E			E	

Intersection Summary			
HCM 2000 Control Delay	32.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	91.8%	ICU Level of Service	F
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 (vph)	335	1313	371	130	1771	33	432	161	380	46	152	466
Future Volume (vph)	335	1313	371	130	1771	33	432	161	380	46	152	466
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5	4.5	4.5	5.5	5.5	4.5	5.0	4.5	4.5	5.0	4.5
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	1636	3547	5255	1636	3547	1925	1636	1829	1925	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	1636	3547	5255	1636	3547	1925	1636	1829	1925	1636
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	345	1354	382	134	1826	34	445	166	392	47	157	480
RTOR Reduction (vph)	0	0	147	0	0	21	0	0	65	0	0	97
Lane Group Flow (vph)	345	1354	235	134	1826	13	445	166	327	47	157	383
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6		3	8	1	7	4	5
Permitted Phases			2			6			8			4
Actuated Green, G (s)	19.8	61.5	80.1	8.5	50.2	50.2	18.6	34.3	42.8	6.2	21.9	41.7
Effective Green, g (s)	19.8	61.5	80.1	8.5	50.2	50.2	18.6	34.3	42.8	6.2	21.9	41.7
Actuated g/C Ratio	0.15	0.47	0.62	0.07	0.39	0.39	0.14	0.26	0.33	0.05	0.17	0.32
Clearance Time (s)	4.5	5.5	4.5	4.5	5.5	5.5	4.5	5.0	4.5	4.5	5.0	4.5
Vehicle Extension (s)	2.0	4.5	2.0	2.0	4.5	4.5	2.0	4.0	2.0	2.0	4.0	2.0
Lane Grp Cap (vph)	540	2486	1008	231	2029	631	507	507	538	87	324	524
v/s Ratio Prot	0.10	0.26	0.03	0.04	c0.35		c0.13	0.09	0.04	0.03	0.08	c0.11
v/s Ratio Perm			0.11			0.01			0.16			0.12
v/c Ratio	0.64	0.54	0.23	0.58	0.90	0.02	0.88	0.33	0.61	0.54	0.48	0.73
Uniform Delay, d1	51.7	24.3	11.2	59.0	37.5	24.7	54.6	38.6	36.6	60.5	48.9	39.2
Progression Factor	1.27	1.47	3.36	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	0.5	0.0	2.4	6.9	0.1	15.3	0.5	1.3	3.6	1.6	4.5
Delay (s)	67.0	36.3	37.6	61.4	44.5	24.8	69.9	39.1	37.9	64.1	50.5	43.7
Level of Service	E	D	D	E	D	C	E	D	D	E	D	D
Approach Delay (s)		41.6			45.3			52.3			46.6	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	45.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	87.5%	ICU Level of Service	E
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 (vph)	0	0	0	175	0	1	0	385	105	5	452	0
Future Volume (vph)	0	0	0	175	0	1	0	385	105	5	452	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				3.0	4.1			3.0	3.1	3.0	3.0	
Lane Util. Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1829	1636			1925	1636	1829	1925	
Flt Permitted				0.95	1.00			1.00	1.00	0.47	1.00	
Satd. Flow (perm)				1829	1636			1925	1636	912	1925	
Peak-hour factor, PHF	0.90	0.90	0.90	0.92	0.90	0.82	0.90	0.93	0.93	0.85	0.92	0.90
Adj. Flow (vph)	0	0	0	190	0	1	0	414	113	6	491	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	33	0	0	0
Lane Group Flow (vph)	0	0	0	190	0	0	0	414	80	6	491	0
Turn Type	Prot			Prot	NA		Prot	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases									2	6		6
Actuated Green, G (s)				17.6	28.1			83.7	83.7	83.7	83.7	
Effective Green, g (s)				18.7	28.1			84.8	84.7	84.8	84.8	
Actuated g/C Ratio				0.16	0.23			0.71	0.71	0.71	0.71	
Clearance Time (s)				4.1	4.1			4.1	4.1	4.1	4.1	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				285	383			1360	1154	644	1360	
v/s Ratio Prot				c0.10	c0.00			0.22			c0.26	
v/s Ratio Perm									0.05	0.01		
v/c Ratio				0.67	0.00			0.30	0.07	0.01	0.36	
Uniform Delay, d1				47.7	35.2			6.6	5.5	5.2	6.9	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				5.8	0.0			0.6	0.1	0.0	0.7	
Delay (s)				53.5	35.2			7.2	5.6	5.2	7.7	
Level of Service				D	D			A	A	A	A	
Approach Delay (s)		0.0			53.4			6.8			7.6	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	40.2%	ICU Level of Service	A
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 (vph)	0	346	20	116	260	0	13	0	335	0	0	0
Future Volume (vph)	0	346	20	116	260	0	13	0	335	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.1	3.0	3.4		3.0		3.0			
Lane Util. Factor		0.95	1.00	1.00	0.95		1.00		1.00			
Frt		1.00	0.85	1.00	1.00		1.00		0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (prot)		3657	1636	1829	3657		1829		1636			
Flt Permitted		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (perm)		3657	1636	1829	3657		1829		1636			
Peak-hour factor, PHF	0.90	0.97	0.97	0.92	0.92	0.90	0.85	0.90	0.92	0.90	0.90	0.90
Adj. Flow (vph)	0	357	21	126	283	0	15	0	364	0	0	0
RTOR Reduction (vph)	0	0	13	0	0	0	0	0	287	0	0	0
Lane Group Flow (vph)	0	357	8	126	283	0	15	0	77	0	0	0
Turn Type		NA	Perm	Prot	NA		Prot		custom			
Protected Phases		4		3	8		2					
Permitted Phases			4						2			
Actuated Green, G (s)		14.7	14.7	7.4	25.8		7.8		7.8			
Effective Green, g (s)		15.8	15.7	8.5	26.9		8.9		8.9			
Actuated g/C Ratio		0.37	0.37	0.20	0.64		0.21		0.21			
Clearance Time (s)		4.1	4.1	4.1	4.5		4.1		4.1			
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0		3.0			
Lane Grp Cap (vph)		1369	608	368	2331		385		345			
v/s Ratio Prot		c0.10		c0.07	0.08		0.01					
v/s Ratio Perm			0.00						c0.05			
v/c Ratio		0.26	0.01	0.34	0.12		0.04		0.22			
Uniform Delay, d1		9.2	8.4	14.5	3.0		13.2		13.8			
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00			
Incremental Delay, d2		0.1	0.0	0.6	0.0		0.0		0.3			
Delay (s)		9.3	8.4	15.0	3.0		13.3		14.1			
Level of Service		A	A	B	A		B		B			
Approach Delay (s)		9.2			6.7			14.1			0.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	42.2	Sum of lost time (s)	9.0
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
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 (vph)	135	1473	211	286	992	37	818	607	490	83	565	88
Future Volume (vph)	135	1473	211	286	992	37	818	607	490	83	565	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0	5.0	4.5	6.0	6.0	5.0	6.0	6.0	4.5	5.5	5.5
Lane Util. Factor	0.97	0.91	0.88	0.97	0.91	1.00	0.94	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	2848	3547	5255	1601	5157	5255	1593	3547	5255	1611
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	2848	3547	5255	1601	5157	5255	1593	3547	5255	1611
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	141	1534	220	298	1033	39	852	632	510	86	589	92
RTOR Reduction (vph)	0	0	44	0	0	25	0	0	131	0	0	74
Lane Group Flow (vph)	141	1534	176	298	1033	14	852	632	379	86	589	18
Confl. Peds. (#/hr)			5			9			13			4
Confl. Bikes (#/hr)			1			1			1			
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	8.8	38.7	58.6	9.7	39.6	39.6	19.9	36.0	36.0	4.9	21.0	21.0
Effective Green, g (s)	8.8	38.7	58.6	9.7	39.6	39.6	19.9	36.0	36.0	4.9	21.0	21.0
Actuated g/C Ratio	0.08	0.35	0.53	0.09	0.36	0.36	0.18	0.33	0.33	0.04	0.19	0.19
Clearance Time (s)	4.5	6.0	5.0	4.5	6.0	6.0	5.0	6.0	6.0	4.5	5.5	5.5
Vehicle Extension (s)	2.0	3.5	2.0	2.0	3.5	3.5	2.0	3.5	3.5	2.0	3.5	3.5
Lane Grp Cap (vph)	282	1843	1513	311	1886	574	930	1715	519	157	1000	306
v/s Ratio Prot	0.04	c0.29	0.02	c0.08	0.20		c0.17	0.12		0.02	0.11	
v/s Ratio Perm			0.04			0.01			c0.24			0.01
v/c Ratio	0.50	0.83	0.12	0.96	0.55	0.02	0.92	0.37	0.73	0.55	0.59	0.06
Uniform Delay, d1	48.6	32.8	12.9	50.1	28.2	22.9	44.4	28.4	32.8	51.6	40.7	36.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	3.5	0.0	39.2	1.1	0.1	13.1	0.2	5.3	2.1	1.0	0.1
Delay (s)	49.2	36.3	12.9	89.3	29.4	22.9	57.5	28.6	38.1	53.7	41.7	36.6
Level of Service	D	D	B	F	C	C	E	C	D	D	D	D
Approach Delay (s)		34.5			42.2			43.4			42.4	
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	0.86		
Actuated Cycle Length (s)	110.3	Sum of lost time (s)	21.0
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
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 (vph)	72	32	839	213	53	25	1112	1962	368	64	729	244
Future Volume (vph)	72	32	839	213	53	25	1112	1962	368	64	729	244
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.1	4.1	4.1		4.1	4.1	4.1	4.1	4.1	
Lane Util. Factor	1.00	0.91	0.91	0.97	1.00		0.94	0.91	1.00	0.97	0.86	
Frt	1.00	0.87	0.85	1.00	0.95		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1829	1518	2978	3547	1832		5157	5255	1636	3547	6372	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1829	1518	2978	3547	1832		5157	5255	1636	3547	6372	
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	1.00	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	78	35	912	229	57	27	1112	2023	379	70	792	265
RTOR Reduction (vph)	0	138	252	0	16	0	0	0	170	0	47	0
Lane Group Flow (vph)	78	180	377	229	68	0	1112	2023	209	70	1010	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	8.0	37.3	37.3	8.0	37.3		28.6	61.9	69.9	6.4	39.7	
Effective Green, g (s)	8.0	37.3	37.3	8.0	37.3		28.6	61.9	69.9	6.4	39.7	
Actuated g/C Ratio	0.06	0.29	0.29	0.06	0.29		0.22	0.48	0.54	0.05	0.31	
Clearance Time (s)	4.1	4.1	4.1	4.1	4.1		4.1	4.1	4.1	4.1	4.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	112	435	854	218	525		1134	2502	931	174	1945	
v/s Ratio Prot	0.04	0.12		c0.06	0.04		c0.22	c0.38	0.01	0.02	0.16	
v/s Ratio Perm			c0.13						0.11			
v/c Ratio	0.70	0.41	0.44	1.05	0.13		0.98	0.81	0.22	0.40	0.52	
Uniform Delay, d1	59.8	37.5	37.8	61.0	34.3		50.4	29.0	15.8	59.9	37.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	17.2	0.6	0.4	74.9	0.1		22.0	2.9	0.1	1.5	1.0	
Delay (s)	77.0	38.1	38.2	135.9	34.4		72.5	31.9	15.9	61.5	38.3	
Level of Service	E	D	D	F	C		E	C	B	E	D	
Approach Delay (s)		41.1			108.6			43.0			39.7	
Approach LOS		D			F			D			D	

Intersection Summary			
HCM 2000 Control Delay	45.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	423	523	2688	0	0	979
Future Volume (vph)	423	523	2688	0	0	979
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.5	1.5	2.0			2.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frpb, ped/bikes	1.00	1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	5255			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	5255			5255
Peak-hour factor, PHF	0.92	0.92	0.91	0.91	0.95	0.95
Adj. Flow (vph)	460	568	2954	0	0	1031
RTOR Reduction (vph)	0	5	0	0	0	0
Lane Group Flow (vph)	460	563	2954	0	0	1031
Confl. Peds. (#/hr)				9		
Confl. Bikes (#/hr)				1		
Turn Type	Prot	Prot	NA			NA
Protected Phases	8	8	2			6
Permitted Phases						
Actuated Green, G (s)	10.5	10.5	39.4			39.4
Effective Green, g (s)	13.5	13.5	42.4			42.4
Actuated g/C Ratio	0.23	0.23	0.71			0.71
Clearance Time (s)	4.5	4.5	5.0			5.0
Vehicle Extension (s)	2.0	2.0	3.5			3.5
Lane Grp Cap (vph)	806	654	3751			3751
v/s Ratio Prot	0.13	c0.20	c0.56			0.20
v/s Ratio Perm						
v/c Ratio	0.57	0.86	0.79			0.27
Uniform Delay, d1	20.4	22.1	5.6			3.0
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.6	10.9	1.2			0.0
Delay (s)	21.0	32.9	6.7			3.1
Level of Service	C	C	A			A
Approach Delay (s)	27.6		6.7			3.1
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	59.4	Sum of lost time (s)	3.5
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	776	392	0	2814	1016	0
Future Volume (vph)	776	392	0	2814	1016	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.5	1.5		2.0	2.1	
Lane Util. Factor	0.97	0.88		0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3547	2880		5255	5255	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3547	2880		5255	5255	
Peak-hour factor, PHF	0.92	0.92	0.97	0.97	0.97	0.97
Adj. Flow (vph)	843	426	0	2901	1047	0
RTOR Reduction (vph)	0	158	0	0	0	0
Lane Group Flow (vph)	843	268	0	2901	1047	0
Confl. Peds. (#/hr)			8			
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases	4					
Actuated Green, G (s)	16.1	16.1		39.0	39.0	
Effective Green, g (s)	19.1	19.1		42.0	41.9	
Actuated g/C Ratio	0.30	0.30		0.65	0.65	
Clearance Time (s)	4.5	4.5		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		3.5	3.5	
Lane Grp Cap (vph)	1048	851		3416	3408	
v/s Ratio Prot	c0.24	0.09		c0.55	0.20	
v/s Ratio Perm						
v/c Ratio	0.80	0.31		0.85	0.31	
Uniform Delay, d1	21.0	17.7		8.8	5.0	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.3	0.1		2.2	0.1	
Delay (s)	25.3	17.7		11.0	5.0	
Level of Service	C	B		B	A	
Approach Delay (s)	22.8			11.0	5.0	
Approach LOS	C			B	A	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	64.6	Sum of lost time (s)	3.6
Intersection Capacity Utilization	114.8%	ICU Level of Service	H
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 (vph)	136	1748	168	163	988	69	141	35	123	25	24	63
Future Volume (vph)	136	1748	168	163	988	69	141	35	123	25	24	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1829	5255	1636	3547	5203		1829	1925	1636	1829	1925	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1829	5255	1636	3547	5203		1829	1925	1636	1829	1925	1636
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	151	1942	187	181	1098	77	157	39	137	28	27	70
RTOR Reduction (vph)	0	0	59	0	5	0	0	0	108	0	0	60
Lane Group Flow (vph)	151	1942	128	181	1170	0	157	39	29	28	27	10
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	15.5	68.6	68.6	11.6	64.7		14.6	27.6	27.6	4.7	17.7	17.7
Effective Green, g (s)	15.5	68.6	68.6	11.6	64.7		14.6	27.6	27.6	4.7	17.7	17.7
Actuated g/C Ratio	0.12	0.53	0.53	0.09	0.50		0.11	0.21	0.21	0.04	0.14	0.14
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	218	2773	863	316	2589		205	408	347	66	262	222
v/s Ratio Prot	c0.08	c0.37		0.05	0.22		c0.09	c0.02		0.02	0.01	
v/s Ratio Perm			0.08						0.02			0.01
v/c Ratio	0.69	0.70	0.15	0.57	0.45		0.77	0.10	0.08	0.42	0.10	0.04
Uniform Delay, d1	55.0	23.0	15.7	56.8	21.2		56.0	41.2	41.1	61.3	49.2	48.8
Progression Factor	1.00	1.00	1.00	1.19	0.66		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.1	1.5	0.4	2.4	0.6		15.6	0.1	0.1	4.3	0.2	0.1
Delay (s)	64.1	24.5	16.1	70.3	14.4		71.6	41.3	41.2	65.7	49.4	48.9
Level of Service	E	C	B	E	B		E	D	D	E	D	D
Approach Delay (s)		26.4			21.9			55.5			52.7	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	28.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	64.2%	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 (vph)	35	1750	180	398	953	26	148	5	183	6	0	12
Future Volume (vph)	35	1750	180	398	953	26	148	5	183	6	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.91		0.97	0.91			1.00	1.00		1.00	
Frt	1.00	0.99		1.00	1.00			1.00	0.85		0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.98	
Satd. Flow (prot)	1829	5181		3547	5234			1836	1636		1726	
Flt Permitted	0.95	1.00		0.95	1.00			0.72	1.00		0.92	
Satd. Flow (perm)	1829	5181		3547	5234			1384	1636		1611	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	39	1944	200	442	1059	29	164	6	203	7	0	13
RTOR Reduction (vph)	0	8	0	0	1	0	0	0	146	0	16	0
Lane Group Flow (vph)	39	2136	0	442	1087	0	0	170	57	0	4	0
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	7.1	66.2		22.6	81.7			27.7	27.7		27.7	
Effective Green, g (s)	7.1	66.2		22.6	81.7			27.7	27.7		27.7	
Actuated g/C Ratio	0.05	0.51		0.17	0.63			0.21	0.21		0.21	
Clearance Time (s)	4.0	5.5		4.0	5.5			4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	99	2638		616	3289			294	348		343	
v/s Ratio Prot	0.02	c0.41		c0.12	0.21							
v/s Ratio Perm								c0.12	0.04		0.00	
v/c Ratio	0.39	0.81		0.72	0.33			0.58	0.16		0.01	
Uniform Delay, d1	59.4	26.6		50.7	11.3			45.9	41.7		40.4	
Progression Factor	1.29	0.35		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	2.0	2.2		4.0	0.3			2.7	0.2		0.0	
Delay (s)	78.5	11.6		54.7	11.6			48.7	41.9		40.4	
Level of Service	E	B		D	B			D	D		D	
Approach Delay (s)		12.8			24.0			45.0			40.4	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
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 (vph)	304	1101	729	596	666	84	680	1016	811	93	634	135
Future Volume (vph)	304	1101	729	596	666	84	680	1016	811	93	634	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	5.0	5.0	6.0		5.0	6.0	5.0	5.0	6.0	6.0
Lane Util. Factor	0.97	0.91	0.88	0.94	0.91		0.94	0.91	0.88	0.97	0.86	0.88
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	2880	5157	5166		5157	5255	2880	3547	6621	2880
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	2880	5157	5166		5157	5255	2880	3547	6621	2880
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	313	1135	752	614	687	87	701	1047	836	96	654	139
RTOR Reduction (vph)	0	0	28	0	10	0	0	0	63	0	0	110
Lane Group Flow (vph)	313	1135	724	614	764	0	701	1047	773	96	654	29
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8	1	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	17.9	35.5	59.5	21.9	39.5		24.0	36.2	58.1	15.4	27.6	27.6
Effective Green, g (s)	17.9	35.5	59.5	21.9	39.5		24.0	36.2	58.1	15.4	27.6	27.6
Actuated g/C Ratio	0.14	0.27	0.45	0.17	0.30		0.18	0.28	0.44	0.12	0.21	0.21
Clearance Time (s)	5.0	6.0	5.0	5.0	6.0		5.0	6.0	5.0	5.0	6.0	6.0
Vehicle Extension (s)	2.0	3.0	2.0	2.0	3.0		2.0	4.0	2.0	2.0	4.0	4.0
Lane Grp Cap (vph)	484	1424	1308	862	1557		944	1452	1277	416	1394	606
v/s Ratio Prot	0.09	c0.22	0.10	c0.12	c0.15		c0.14	c0.20	0.10	0.03	0.10	
v/s Ratio Perm			0.15						0.17			0.01
v/c Ratio	0.65	0.80	0.55	0.71	0.49		0.74	0.72	0.61	0.23	0.47	0.05
Uniform Delay, d1	53.6	44.4	26.1	51.6	37.5		50.6	42.8	27.7	52.4	45.3	41.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	3.2	0.3	2.3	0.2		2.8	1.9	0.6	0.1	0.3	0.0
Delay (s)	55.8	47.6	26.4	53.9	37.8		53.4	44.8	28.3	52.5	45.6	41.3
Level of Service	E	D	C	D	D		D	D	C	D	D	D
Approach Delay (s)		41.5			44.9			41.8			45.7	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	42.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	131.0	Sum of lost time (s)	22.0
Intersection Capacity Utilization	85.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	801	361	2017	0	0	1619
Future Volume (vph)	801	361	2017	0	0	1619
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.5	2.5	2.0			2.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	5255			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	5255			5255
Peak-hour factor, PHF	0.84	0.84	0.91	0.91	0.94	0.94
Adj. Flow (vph)	954	430	2216	0	0	1722
RTOR Reduction (vph)	0	10	0	0	0	0
Lane Group Flow (vph)	954	420	2216	0	0	1722
Turn Type	Prot	Prot	NA			NA
Protected Phases	8	8	2			6
Permitted Phases	8					
Actuated Green, G (s)	15.6	15.6	31.8			31.8
Effective Green, g (s)	17.6	17.6	34.8			34.8
Actuated g/C Ratio	0.31	0.31	0.61			0.61
Clearance Time (s)	4.5	4.5	5.0			5.0
Vehicle Extension (s)	2.0	2.0	3.5			3.5
Lane Grp Cap (vph)	1097	890	3213			3213
v/s Ratio Prot	c0.27	0.15	c0.42			0.33
v/s Ratio Perm						
v/c Ratio	0.87	0.47	0.69			0.54
Uniform Delay, d1	18.6	15.9	7.4			6.4
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	7.3	0.1	0.7			0.2
Delay (s)	25.8	16.0	8.1			6.6
Level of Service	C	B	A			A
Approach Delay (s)	22.8		8.1			6.6
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	56.9	Sum of lost time (s)	4.5
Intersection Capacity Utilization	104.6%	ICU Level of Service	G
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 (vph)	526	237	320	181	0	517	0	2299	143	373	1246	0
Future Volume (vph)	526	237	320	181	0	517	0	2299	143	373	1246	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5		4.5		5.0	5.0	4.5	5.0	
Lane Util. Factor	0.97	1.00	1.00	0.97		0.88		0.91	1.00	0.97	0.95	
Frt	1.00	1.00	0.85	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3547	1925	1636	3547		2880		5255	1636	3547	3657	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3547	1925	1636	3547		2880		5255	1636	3547	3657	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	572	258	348	197	0	562	0	2370	147	385	1285	0
RTOR Reduction (vph)	0	0	81	0	0	0	0	0	57	0	0	0
Lane Group Flow (vph)	572	258	267	197	0	562	0	2370	90	385	1285	0
Turn Type	Split	NA	Perm	Prot		pt+ov		NA	Perm	Prot	NA	
Protected Phases	4	4		8		1 8		2		1	6	
Permitted Phases			4	8					2			
Actuated Green, G (s)	23.0	23.0	23.0	8.0		22.0		45.2	45.2	9.5	59.2	
Effective Green, g (s)	23.0	23.0	23.0	8.0		22.0		45.2	45.2	9.5	59.2	
Actuated g/C Ratio	0.22	0.22	0.22	0.08		0.21		0.43	0.43	0.09	0.57	
Clearance Time (s)	4.5	4.5	4.5	4.5				5.0	5.0	4.5	5.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0				3.5	3.5	2.0	3.5	
Lane Grp Cap (vph)	782	424	361	272		608		2279	709	323	2077	
v/s Ratio Prot	0.16	0.13		0.06		c0.20		c0.45		c0.11	0.35	
v/s Ratio Perm			c0.16						0.06			
v/c Ratio	0.73	0.61	0.74	0.72		0.92		1.04	0.13	1.19	0.62	
Uniform Delay, d1	37.7	36.5	37.8	47.0		40.3		29.5	17.7	47.4	15.0	
Progression Factor	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.1	1.7	6.7	7.8		19.6		30.2	0.1	112.9	0.6	
Delay (s)	40.8	38.2	44.5	54.9		59.9		59.7	17.8	160.2	15.6	
Level of Service	D	D	D	D		E		E	B	F	B	
Approach Delay (s)		41.3			58.6			57.3			48.9	
Approach LOS		D			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	52.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	104.2	Sum of lost time (s)	18.5
Intersection Capacity Utilization	89.6%	ICU Level of Service	E
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 (vph)	166	421	10	148	266	195	60	412	516	306	246	151
Future Volume (vph)	166	421	10	148	266	195	60	412	516	306	246	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1		4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	
Lane Util. Factor	1.00	1.00		0.97	0.95	1.00	1.00	0.91	0.91	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.95	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1829	1917		3547	3657	1606	1829	3301	1470	1829	3431	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1829	1917		3547	3657	1606	1829	3301	1470	1829	3431	
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)	180	458	11	161	289	212	65	448	561	333	267	164
RTOR Reduction (vph)	0	1	0	0	0	167	0	54	156	0	74	0
Lane Group Flow (vph)	180	468	0	161	289	45	65	641	158	333	357	0
Confl. Peds. (#/hr)			2			5			1			1
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	12.9	31.7		6.9	25.7	25.7	7.0	41.5	41.5	23.5	58.0	
Effective Green, g (s)	12.9	31.7		6.9	25.7	25.7	7.0	41.5	41.5	23.5	58.0	
Actuated g/C Ratio	0.11	0.26		0.06	0.21	0.21	0.06	0.35	0.35	0.20	0.48	
Clearance Time (s)	4.1	4.1		4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	196	506		203	783	343	106	1141	508	358	1658	
v/s Ratio Prot	c0.10	c0.24		0.05	0.08		0.04	c0.19		c0.18	0.10	
v/s Ratio Perm						0.03			0.11			
v/c Ratio	0.92	0.93		0.79	0.37	0.13	0.61	0.56	0.31	0.93	0.22	
Uniform Delay, d1	53.0	43.0		55.8	40.2	38.1	55.2	31.9	28.8	47.4	17.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	41.5	22.9		18.8	0.3	0.2	10.1	2.0	1.6	30.3	0.3	
Delay (s)	94.5	65.9		74.7	40.5	38.3	65.3	33.9	30.3	77.7	18.2	
Level of Service	F	E		E	D	D	E	C	C	E	B	
Approach Delay (s)		73.8			48.1			34.7			44.1	
Approach LOS		E			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	47.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
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		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	52	46	0	123	50	504	1	242	105	246	90	18
Future Volume (vph)	52	46	0	123	50	504	1	242	105	246	90	18
Peak Hour Factor	0.92	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	57	184	0	134	54	548	1	263	114	267	98	20

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total (vph)	241	188	548	133	246	385
Volume Left (vph)	57	134	0	1	0	267
Volume Right (vph)	0	0	548	0	114	20
Hadj (s)	0.08	0.18	-0.57	0.04	-0.29	0.14
Departure Headway (s)	6.8	7.0	3.2	6.8	6.5	6.4
Degree Utilization, x	0.45	0.37	0.49	0.25	0.44	0.68
Capacity (veh/h)	477	446	1116	494	511	531
Control Delay (s)	15.2	14.0	9.2	10.9	13.3	22.1
Approach Delay (s)	15.2	10.4		12.4		22.1
Approach LOS	C	B		B		C

Intersection Summary			
Delay	14.1		
Level of Service	B		
Intersection Capacity Utilization	59.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	916	808	62	203	353	1069	25	1233	289	604	286	203
Future Volume (vph)	916	808	62	203	353	1069	25	1233	289	604	286	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	1636	3547	5255	1636	3547	5255	1636	3547	5255	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	1636	3547	5255	1636	3547	5255	1636	3547	5255	1636
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	0.93
Adj. Flow (vph)	996	878	67	221	384	1162	27	1340	314	657	311	218
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	996	878	67	221	384	1162	27	1340	314	657	311	218
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			Free			Free			Free			Free
Actuated Green, G (s)	27.1	33.1	111.3	11.3	17.3	111.3	3.8	29.8	111.3	17.1	43.1	111.3
Effective Green, g (s)	28.1	36.1	111.3	12.3	20.3	111.3	4.8	32.8	111.3	18.1	46.1	111.3
Actuated g/C Ratio	0.25	0.32	1.00	0.11	0.18	1.00	0.04	0.29	1.00	0.16	0.41	1.00
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	895	1704	1636	391	958	1636	152	1548	1636	576	2176	1636
v/s Ratio Prot	c0.28	0.17		0.06	0.07		0.01	c0.26		c0.19	0.06	
v/s Ratio Perm			0.04			c0.71			0.19			0.13
v/c Ratio	1.11	0.52	0.04	0.57	0.40	0.71	0.18	0.87	0.19	1.14	0.14	0.13
Uniform Delay, d1	41.6	30.5	0.0	47.0	40.1	0.0	51.3	37.2	0.0	46.6	20.3	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	66.0	0.3	0.0	1.9	0.3	2.6	0.6	5.3	0.3	82.7	0.0	0.2
Delay (s)	107.6	30.8	0.0	48.8	40.4	2.6	51.9	42.5	0.3	129.3	20.3	0.2
Level of Service	F	C	A	D	D	A	D	D	A	F	C	A
Approach Delay (s)		69.1			16.6			34.8			77.0	
Approach LOS		E			B			C			E	

Intersection Summary			
HCM 2000 Control Delay	47.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	111.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Appendix E – Near-Term with Project Conditions Level of Service Analysis Worksheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	0	67	50	1	260	16	992	15	277	2038	6
Future Volume (vph)	17	0	67	50	1	260	16	992	15	277	2038	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5		4.0	4.0	4.0	3.5	5.0		3.5	5.0	5.0
Lane Util. Factor		1.00		1.00	1.00	0.88	1.00	0.91		1.00	0.91	1.00
Frt		0.89		1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected		0.99		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1700		1829	1925	2880	1829	5243		1829	5255	1636
Flt Permitted		0.94		0.39	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1620		757	1925	2880	1829	5243		1829	5255	1636
Peak-hour factor, PHF	0.63	0.63	0.63	0.77	0.77	0.92	0.93	0.93	0.93	0.96	0.96	0.96
Adj. Flow (vph)	27	0	106	65	1	283	17	1067	16	289	2123	6
RTOR Reduction (vph)	0	67	0	0	0	251	0	1	0	0	0	1
Lane Group Flow (vph)	0	66	0	65	1	32	17	1082	0	289	2123	5
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						6
Actuated Green, G (s)		15.4		14.9	14.9	14.9	2.8	77.7		24.9	99.8	99.8
Effective Green, g (s)		15.4		14.9	14.9	14.9	2.8	77.7		24.9	99.8	99.8
Actuated g/C Ratio		0.12		0.11	0.11	0.11	0.02	0.60		0.19	0.77	0.77
Clearance Time (s)		3.5		4.0	4.0	4.0	3.5	5.0		3.5	5.0	5.0
Vehicle Extension (s)		2.0		2.0	2.0	2.0	2.0	4.0		2.0	4.0	4.0
Lane Grp Cap (vph)		191		86	220	330	39	3133		350	4034	1255
v/s Ratio Prot					0.00		0.01	0.21		c0.16	c0.40	
v/s Ratio Perm		0.04		c0.09		0.01						0.00
v/c Ratio		0.35		0.76	0.00	0.10	0.44	0.35		0.83	0.53	0.00
Uniform Delay, d1		52.7		55.8	51.0	51.5	62.8	13.3		50.5	5.9	3.5
Progression Factor		1.00		1.13	1.24	2.50	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.4		27.8	0.0	0.0	2.8	0.3		14.0	0.5	0.0
Delay (s)		53.1		90.7	63.0	129.1	65.6	13.6		64.4	6.4	3.5
Level of Service		D		F	E	F	E	B		E	A	A
Approach Delay (s)		53.1			121.7			14.4			13.3	
Approach LOS		D			F			B			B	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	65.3%	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 (vph)	50	284	429	338	810	240	617	986	360	256	1710	80
Future Volume (vph)	50	284	429	338	810	240	617	986	360	256	1710	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	5.0	5.0	5.5	5.5	5.0	5.5	5.5	5.0	5.5	
Lane Util. Factor	0.97	0.91	0.88	0.94	0.91	1.00	0.94	0.91	0.88	0.97	0.86	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3547	5255	2880	5157	5255	1636	5157	5255	2880	3547	6577	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3547	5255	2880	5157	5255	1636	5157	5255	2880	3547	6577	
Peak-hour factor, PHF	0.95	0.95	0.95	0.92	0.92	0.92	0.95	0.95	0.95	0.96	0.96	0.96
Adj. Flow (vph)	53	299	452	367	880	261	649	1038	379	267	1781	83
RTOR Reduction (vph)	0	0	55	0	0	192	0	0	223	0	4	0
Lane Group Flow (vph)	53	299	397	367	880	69	649	1038	156	267	1860	0
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	3.9	20.1	42.3	16.1	32.8	32.8	22.2	51.4	51.4	15.8	45.0	
Effective Green, g (s)	3.9	20.1	42.3	16.1	32.8	32.8	22.2	51.4	51.4	15.8	45.0	
Actuated g/C Ratio	0.03	0.16	0.34	0.13	0.26	0.26	0.18	0.41	0.41	0.13	0.36	
Clearance Time (s)	5.0	6.0	5.0	5.0	5.5	5.5	5.0	5.5	5.5	5.0	5.5	
Vehicle Extension (s)	2.0	4.5	2.0	2.0	4.5	4.5	2.0	4.5	4.5	2.0	4.5	
Lane Grp Cap (vph)	110	845	975	664	1380	429	916	2162	1185	448	2369	
v/s Ratio Prot	0.01	0.06	0.07	c0.07	c0.17		c0.13	0.20		0.08	c0.28	
v/s Ratio Perm			0.07			0.04			0.05			
v/c Ratio	0.48	0.35	0.41	0.55	0.64	0.16	0.71	0.48	0.13	0.60	0.79	
Uniform Delay, d1	59.5	46.6	31.7	51.0	40.8	35.4	48.3	27.0	22.9	51.5	35.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	0.4	0.1	0.6	1.2	0.3	2.1	0.3	0.1	1.4	2.0	
Delay (s)	60.7	47.1	31.8	51.6	42.0	35.7	50.4	27.2	23.0	53.0	37.6	
Level of Service	E	D	C	D	D	D	D	C	C	D	D	
Approach Delay (s)		39.4			43.3			33.7			39.6	
Approach LOS		D			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	38.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	124.9	Sum of lost time (s)	21.5
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	494	885	1109	0	0	2157
Future Volume (vph)	494	885	1109	0	0	2157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0			3.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	5255			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	5255			5255
Peak-hour factor, PHF	0.95	0.95	0.92	0.91	0.96	0.96
Adj. Flow (vph)	520	932	1205	0	0	2247
RTOR Reduction (vph)	0	59	0	0	0	0
Lane Group Flow (vph)	520	873	1205	0	0	2247
Turn Type	Prot	Prot	NA			NA
Protected Phases	4	4	2			6
Permitted Phases	4					
Actuated Green, G (s)	18.9	18.9	29.1			29.1
Effective Green, g (s)	21.9	21.9	32.1			32.1
Actuated g/C Ratio	0.36	0.36	0.54			0.54
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	5.0	5.0	5.0			1.8
Lane Grp Cap (vph)	1294	1051	2811			2811
v/s Ratio Prot	0.15	c0.30	0.23			c0.43
v/s Ratio Perm						
v/c Ratio	0.40	0.83	0.43			0.80
Uniform Delay, d1	14.2	17.4	8.4			11.3
Progression Factor	1.00	1.00	1.12			1.00
Incremental Delay, d2	0.4	6.3	0.4			2.5
Delay (s)	14.6	23.7	9.8			13.8
Level of Service	B	C	A			B
Approach Delay (s)	20.4		9.8			13.8
Approach LOS	C		A			B

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	639	1771	0	1260	1874	0
Future Volume (vph)	639	1771	0	1260	1874	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	
Lane Util. Factor	0.97	0.88		0.91	0.91	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3547	2880		5255	5255	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3547	2880		5255	5255	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	666	1845	0	1312	1952	0
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	666	1845	0	1313	1952	0
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases	4			2		
Actuated Green, G (s)	30.0	30.0		18.0	18.0	
Effective Green, g (s)	33.0	33.0		21.0	21.0	
Actuated g/C Ratio	0.55	0.55		0.35	0.35	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	1.8	1.8		5.0	5.0	
Lane Grp Cap (vph)	1950	1584		1839	1839	
v/s Ratio Prot	0.19	c0.64		0.25	c0.37	
v/s Ratio Perm						
v/c Ratio	0.34	1.16		0.71	1.06	
Uniform Delay, d1	7.5	13.5		16.9	19.5	
Progression Factor	1.00	1.00		1.00	0.74	
Incremental Delay, d2	0.0	81.3		2.4	37.6	
Delay (s)	7.5	94.8		19.3	52.0	
Level of Service	A	F		B	D	
Approach Delay (s)	71.7			19.3	52.0	
Approach LOS	E			B	D	

Intersection Summary			
HCM 2000 Control Delay	53.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	104.8%	ICU Level of Service	G
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 (vph)	6	838	164	48	1313	245	66	0	30	270	0	0
Future Volume (vph)	6	838	164	48	1313	245	66	0	30	270	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	6.0	6.0	4.5	6.0	6.0	4.1	5.0		4.1		
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		0.97		
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00		
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95		
Satd. Flow (prot)	1829	5255	1636	1829	5255	1636	1829	1636		3547		
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95		
Satd. Flow (perm)	1829	5255	1636	1829	5255	1636	1829	1636		3547		
Peak-hour factor, PHF	0.90	0.93	0.93	0.92	0.92	0.92	0.92	0.90	0.92	0.92	0.90	0.90
Adj. Flow (vph)	7	901	176	52	1427	266	72	0	33	293	0	0
RTOR Reduction (vph)	0	0	66	0	0	87	0	29	0	0	0	0
Lane Group Flow (vph)	7	901	110	52	1427	179	72	4	0	293	0	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	1.4	81.5	81.5	6.9	87.4	87.4	8.7	14.7		7.3		
Effective Green, g (s)	1.4	81.5	81.5	6.9	87.4	87.4	8.7	14.7		7.3		
Actuated g/C Ratio	0.01	0.63	0.63	0.05	0.67	0.67	0.07	0.11		0.06		
Clearance Time (s)	4.1	6.0	6.0	4.5	6.0	6.0	4.1	5.0		4.1		
Vehicle Extension (s)	3.0	4.5	4.5	2.0	4.5	4.5	3.0	2.0		3.0		
Lane Grp Cap (vph)	19	3294	1025	97	3532	1099	122	184		199		
v/s Ratio Prot	0.00	0.17		c0.03	c0.27		0.04	c0.00		c0.08		
v/s Ratio Perm			0.07			0.11						
v/c Ratio	0.37	0.27	0.11	0.54	0.40	0.16	0.59	0.02		1.47		
Uniform Delay, d1	63.9	10.9	9.7	60.0	9.6	7.8	58.9	51.2		61.4		
Progression Factor	1.00	1.00	1.00	0.83	1.66	4.82	1.00	1.00		0.84		
Incremental Delay, d2	11.7	0.2	0.2	2.7	0.3	0.3	7.4	0.0		233.8		
Delay (s)	75.5	11.1	9.9	52.2	16.2	38.1	66.4	51.3		285.1		
Level of Service	E	B	A	D	B	D	E	D		F		
Approach Delay (s)		11.3			20.6			61.6			285.1	
Approach LOS		B			C			E			F	

Intersection Summary			
HCM 2000 Control Delay	42.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.6
Intersection Capacity Utilization	55.7%	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												
Traffic Volume (vph)	45	831	178	47	1242	0	146	0	68	0	0	0
Future Volume (vph)	45	831	178	47	1242	0	146	0	68	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0		4.5	4.5				
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		1.00	1.00				
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85				
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00				
Satd. Flow (prot)	3547	5255	1636	1829	5255		1829	1636				
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00				
Satd. Flow (perm)	3547	5255	1636	1829	5255		1829	1636				
Peak-hour factor, PHF	0.90	0.90	0.90	0.94	0.94	0.94	0.84	0.84	0.84	0.25	0.25	0.25
Adj. Flow (vph)	50	923	198	50	1321	0	174	0	81	0	0	0
RTOR Reduction (vph)	0	0	63	0	0	0	0	69	0	0	0	0
Lane Group Flow (vph)	50	923	135	50	1321	0	174	12	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	5.3	88.8	88.8	7.0	90.5		19.2	19.2				
Effective Green, g (s)	5.3	88.8	88.8	7.0	90.5		19.2	19.2				
Actuated g/C Ratio	0.04	0.68	0.68	0.05	0.70		0.15	0.15				
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0		4.5	4.5				
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5		2.0	2.0				
Lane Grp Cap (vph)	144	3589	1117	98	3658		270	241				
v/s Ratio Prot	0.01	0.18		c0.03	c0.25		c0.10	0.01				
v/s Ratio Perm			0.08									
v/c Ratio	0.35	0.26	0.12	0.51	0.36		0.64	0.05				
Uniform Delay, d1	60.7	7.9	7.1	59.8	8.0		52.2	47.6				
Progression Factor	0.83	1.06	3.37	1.23	0.63		1.00	1.00				
Incremental Delay, d2	0.4	0.1	0.2	1.8	0.3		3.9	0.0				
Delay (s)	50.5	8.5	24.2	75.6	5.3		56.1	47.6				
Level of Service	D	A	C	E	A		E	D				
Approach Delay (s)		13.0			7.9			53.4			0.0	
Approach LOS		B			A			D			A	

Intersection Summary			
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
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 (vph)	0	803	213	76	1118	0	150	42	63	0	0	0
Future Volume (vph)	0	803	213	76	1118	0	150	42	63	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.5	5.5	4.5	5.5		4.1	4.5				
Lane Util. Factor		0.91	1.00	1.00	0.91		0.97	1.00				
Frt		1.00	0.85	1.00	1.00		1.00	0.91				
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00				
Satd. Flow (prot)		5255	1636	1829	5255		3547	1753				
Flt Permitted		1.00	1.00	0.95	1.00		0.95	1.00				
Satd. Flow (perm)		5255	1636	1829	5255		3547	1753				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.90	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	0	873	232	83	1215	0	163	46	68	0	0	0
RTOR Reduction (vph)	0	0	90	0	0	0	0	47	0	0	0	0
Lane Group Flow (vph)	0	873	142	83	1215	0	163	67	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)		79.8	79.8	10.2	94.5		11.0	25.5				
Effective Green, g (s)		79.8	79.8	10.2	94.5		11.0	25.5				
Actuated g/C Ratio		0.61	0.61	0.08	0.73		0.08	0.20				
Clearance Time (s)		5.5	5.5	4.5	5.5		4.1	4.5				
Vehicle Extension (s)		4.5	4.5	2.0	4.5		3.0	2.0				
Lane Grp Cap (vph)		3225	1004	143	3819		300	343				
v/s Ratio Prot		0.17		c0.05	c0.23		c0.05	c0.04				
v/s Ratio Perm			0.09									
v/c Ratio		0.27	0.14	0.58	0.32		0.54	0.20				
Uniform Delay, d1		11.6	10.6	57.8	6.3		57.1	43.7				
Progression Factor		0.30	0.28	1.10	0.67		1.00	1.00				
Incremental Delay, d2		0.2	0.3	3.6	0.2		2.0	0.1				
Delay (s)		3.7	3.2	67.3	4.4		59.1	43.8				
Level of Service		A	A	E	A		E	D				
Approach Delay (s)		3.6			8.4			52.8			0.0	
Approach LOS		A			A			D			A	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	43.6%	ICU Level of Service	A
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 (vph)	263	537	107	270	684	29	129	29	186	14	125	378
Future Volume (vph)	263	537	107	270	684	29	129	29	186	14	125	378
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5	5.5	4.5	5.5	5.5	4.5	5.0	5.0	4.5	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	1636	3547	5255	1636	3547	1925	1636	1829	1925	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	1636	3547	5255	1636	3547	1925	1636	1829	1925	1636
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	0.92	0.92	0.92	0.88	0.88	0.88
Adj. Flow (vph)	286	584	116	290	735	31	140	32	202	16	142	430
RTOR Reduction (vph)	0	0	59	0	0	16	0	0	156	0	0	319
Lane Group Flow (vph)	286	584	57	290	735	15	140	32	46	16	142	111
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	14.7	63.5	63.5	14.5	63.3	63.3	9.2	29.8	29.8	2.7	23.3	23.3
Effective Green, g (s)	14.7	63.5	63.5	14.5	63.3	63.3	9.2	29.8	29.8	2.7	23.3	23.3
Actuated g/C Ratio	0.11	0.49	0.49	0.11	0.49	0.49	0.07	0.23	0.23	0.02	0.18	0.18
Clearance Time (s)	4.5	5.5	5.5	4.5	5.5	5.5	4.5	5.0	5.0	4.5	5.0	5.0
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5	4.5	2.0	4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)	401	2566	799	395	2558	796	251	441	375	37	345	293
v/s Ratio Prot	c0.08	0.11		c0.08	c0.14		c0.04	0.02		0.01	c0.07	
v/s Ratio Perm			0.03			0.01			0.03			0.07
v/c Ratio	0.71	0.23	0.07	0.73	0.29	0.02	0.56	0.07	0.12	0.43	0.41	0.38
Uniform Delay, d1	55.6	19.1	17.6	55.9	19.9	17.3	58.4	39.3	39.7	62.9	47.3	47.0
Progression Factor	0.83	1.35	3.47	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.9	0.2	0.2	6.0	0.3	0.0	1.5	0.1	0.2	2.9	1.1	1.1
Delay (s)	51.1	26.1	61.3	61.9	20.2	17.3	60.0	39.4	39.9	65.8	48.4	48.1
Level of Service	D	C	E	E	C	B	E	D	D	E	D	D
Approach Delay (s)		37.5			31.5			47.4			48.6	
Approach LOS		D			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	38.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
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 (vph)	0	0	0	133	0	0	0	205	56	8	384	0
Future Volume (vph)	0	0	0	133	0	0	0	205	56	8	384	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				3.0				3.0	3.1	3.0	3.0	
Lane Util. Factor				1.00				1.00	1.00	1.00	1.00	
Frt				1.00				1.00	0.85	1.00	1.00	
Flt Protected				0.95				1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1829				1925	1636	1829	1925	
Flt Permitted				0.95				1.00	1.00	0.95	1.00	
Satd. Flow (perm)				1829				1925	1636	1829	1925	
Peak-hour factor, PHF	0.90	0.90	0.90	0.82	0.90	0.82	0.90	0.88	0.88	0.90	0.90	0.90
Adj. Flow (vph)	0	0	0	162	0	0	0	233	64	9	427	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	22	0	0	0
Lane Group Flow (vph)	0	0	0	162	0	0	0	233	42	9	427	0
Turn Type	Prot			Prot			Prot	NA	Perm	Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)				15.1				71.8	71.8	1.4	77.3	
Effective Green, g (s)				16.2				72.9	72.8	2.5	78.4	
Actuated g/C Ratio				0.15				0.66	0.66	0.02	0.71	
Clearance Time (s)				4.1				4.1	4.1	4.1	4.1	
Vehicle Extension (s)				3.0				3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				266				1263	1072	41	1358	
v/s Ratio Prot				c0.09				0.12		0.00	c0.22	
v/s Ratio Perm									0.03			
v/c Ratio				0.61				0.18	0.04	0.22	0.31	
Uniform Delay, d1				44.5				7.5	6.8	53.3	6.2	
Progression Factor				1.00				1.00	1.00	1.00	1.00	
Incremental Delay, d2				3.9				0.3	0.1	2.7	0.6	
Delay (s)				48.4				7.8	6.8	56.0	6.8	
Level of Service				D				A	A	E	A	
Approach Delay (s)		0.0			48.4			7.6			7.8	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	111.1	Sum of lost time (s)	15.3
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
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 (vph)	0	103	14	296	363	0	32	0	205	0	0	0
Future Volume (vph)	0	103	14	296	363	0	32	0	205	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.1	3.0	3.0		3.0		3.0			
Lane Util. Factor		0.95	1.00	1.00	0.95		1.00		1.00			
Frt		1.00	0.85	1.00	1.00		1.00		0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (prot)		3657	1636	1829	3657		1829		1636			
Flt Permitted		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (perm)		3657	1636	1829	3657		1829		1636			
Peak-hour factor, PHF	0.90	0.73	0.73	0.81	0.81	0.90	0.76	0.90	0.76	0.90	0.90	0.90
Adj. Flow (vph)	0	141	19	365	448	0	42	0	270	0	0	0
RTOR Reduction (vph)	0	0	14	0	0	0	0	0	185	0	0	0
Lane Group Flow (vph)	0	141	5	365	448	0	42	0	85	0	0	0
Turn Type		NA	Perm	Prot	NA		Prot		custom			
Protected Phases		4		3	8		2					
Permitted Phases			4						2			
Actuated Green, G (s)		15.9	15.9	19.7	39.7		20.5		20.5			
Effective Green, g (s)		17.0	16.9	20.8	40.8		21.6		21.6			
Actuated g/C Ratio		0.25	0.25	0.30	0.60		0.32		0.32			
Clearance Time (s)		4.1	4.1	4.1	4.1		4.1		4.1			
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0		3.0			
Lane Grp Cap (vph)		908	404	556	2181		577		516			
v/s Ratio Prot		0.04		c0.20	c0.12		0.02					
v/s Ratio Perm			0.00						c0.05			
v/c Ratio		0.16	0.01	0.66	0.21		0.07		0.17			
Uniform Delay, d1		20.1	19.4	20.7	6.3		16.4		16.9			
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00			
Incremental Delay, d2		0.1	0.0	2.8	0.0		0.2		0.7			
Delay (s)		20.2	19.5	23.5	6.4		16.6		17.6			
Level of Service		C	B	C	A		B		B			
Approach Delay (s)		20.1			14.1			17.5			0.0	
Approach LOS		C			B			B			A	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	68.4	Sum of lost time (s)	9.0
Intersection Capacity Utilization	33.1%	ICU Level of Service	A
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 (vph)	74	369	92	292	814	79	347	552	115	16	444	151
Future Volume (vph)	74	369	92	292	814	79	347	552	115	16	444	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0	5.0	4.5	6.0		5.0	6.0	6.0	4.5	5.5	5.5
Lane Util. Factor	0.97	0.91	0.88	0.97	0.91		0.94	0.91	0.88	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	2843	3547	5174		5157	5255	2819	3547	5255	1598
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	2843	3547	5174		5157	5255	2819	3547	5255	1598
Peak-hour factor, PHF	0.76	0.76	0.76	0.83	0.83	0.83	0.93	0.93	0.93	0.81	0.81	0.81
Adj. Flow (vph)	97	486	121	352	981	95	373	594	124	20	548	186
RTOR Reduction (vph)	0	0	49	0	7	0	0	0	95	0	0	151
Lane Group Flow (vph)	97	486	72	352	1069	0	373	594	29	20	548	35
Confl. Peds. (#/hr)			4			9			7			7
Confl. Bikes (#/hr)			1			1						3
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	7.6	59.5	75.9	17.4	69.3		16.4	32.5	32.5	7.1	23.2	23.2
Effective Green, g (s)	7.6	59.5	75.9	17.4	69.3		16.4	32.5	32.5	7.1	23.2	23.2
Actuated g/C Ratio	0.06	0.43	0.55	0.13	0.50		0.12	0.24	0.24	0.05	0.17	0.17
Clearance Time (s)	4.5	6.0	5.0	4.5	6.0		5.0	6.0	6.0	4.5	5.5	5.5
Vehicle Extension (s)	2.0	3.5	2.0	2.0	3.5		2.0	3.5	3.5	2.0	3.5	3.5
Lane Grp Cap (vph)	196	2273	1569	448	2607		615	1242	666	183	886	269
v/s Ratio Prot	0.03	0.09	0.01	c0.10	c0.21		c0.07	0.11		0.01	c0.10	
v/s Ratio Perm			0.02						0.01			0.02
v/c Ratio	0.49	0.21	0.05	0.79	0.41		0.61	0.48	0.04	0.11	0.62	0.13
Uniform Delay, d1	63.1	24.4	14.2	58.2	21.3		57.5	45.2	40.5	62.2	53.0	48.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.71	0.62	0.58	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.2	0.0	8.2	0.5		1.1	0.3	0.0	0.1	1.4	0.3
Delay (s)	63.8	24.6	14.2	66.4	21.8		42.0	28.2	23.7	62.3	54.4	48.8
Level of Service	E	C	B	E	C		D	C	C	E	D	D
Approach Delay (s)		28.2			32.8			32.4			53.2	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	35.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	137.5	Sum of lost time (s)	21.0
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
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 (vph)	6	8	412	81	16	12	712	1018	104	11	716	145
Future Volume (vph)	6	8	412	81	16	12	712	1018	104	11	716	145
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.1	4.1	4.1		4.1	4.1	4.1	4.1	4.1	
Lane Util. Factor	1.00	0.91	0.91	0.97	1.00		0.94	0.91	1.00	0.97	0.86	
Frt	1.00	0.86	0.85	1.00	0.94		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1829	1504	2978	3547	1804		5157	5255	1636	3547	6454	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1829	1504	2978	3547	1804		5157	5255	1636	3547	6454	
Peak-hour factor, PHF	0.92	0.92	0.92	0.90	0.90	0.90	0.97	0.97	0.97	0.86	0.92	0.92
Adj. Flow (vph)	7	9	448	90	18	13	734	1049	107	13	778	158
RTOR Reduction (vph)	0	107	229	0	9	0	0	0	42	0	22	0
Lane Group Flow (vph)	7	45	76	90	22	0	734	1049	65	13	914	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	1.6	34.2	34.2	8.0	40.6		23.8	75.7	83.7	3.2	55.1	
Effective Green, g (s)	1.6	34.2	34.2	8.0	40.6		23.8	75.7	83.7	3.2	55.1	
Actuated g/C Ratio	0.01	0.25	0.25	0.06	0.30		0.17	0.55	0.61	0.02	0.40	
Clearance Time (s)	4.1	4.1	4.1	4.1	4.1		4.1	4.1	4.1	4.1	4.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	21	374	740	206	532		892	2893	1044	82	2586	
v/s Ratio Prot	0.00	c0.03		c0.03	0.01		c0.14	c0.20	0.00	0.00	0.14	
v/s Ratio Perm			0.03						0.04			
v/c Ratio	0.33	0.12	0.10	0.44	0.04		0.82	0.36	0.06	0.16	0.35	
Uniform Delay, d1	67.4	40.0	39.8	62.6	34.6		54.8	17.4	10.9	65.8	28.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.08	0.83	
Incremental Delay, d2	9.1	0.1	0.1	1.5	0.0		6.2	0.4	0.0	0.8	0.3	
Delay (s)	76.6	40.1	39.9	64.1	34.6		61.0	17.7	11.0	71.7	24.3	
Level of Service	E	D	D	E	C		E	B	B	E	C	
Approach Delay (s)		40.5			56.5			34.1			24.9	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	137.5	Sum of lost time (s)	16.4
Intersection Capacity Utilization	45.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	503	627	1207	0	0	831
Future Volume (vph)	503	627	1207	0	0	831
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.5	1.5	2.0			2.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frpb, ped/bikes	1.00	1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	5255			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	5255			5255
Peak-hour factor, PHF	0.95	0.95	0.93	0.93	0.88	0.88
Adj. Flow (vph)	529	660	1298	0	0	944
RTOR Reduction (vph)	0	84	0	0	0	0
Lane Group Flow (vph)	529	576	1298	0	0	944
Confl. Peds. (#/hr)				3		
Confl. Bikes (#/hr)				1		
Turn Type	Prot	Prot	NA			NA
Protected Phases	8	8	2			6
Permitted Phases						
Actuated Green, G (s)	12.1	12.1	19.9			19.9
Effective Green, g (s)	15.1	15.1	22.9			22.9
Actuated g/C Ratio	0.36	0.36	0.55			0.55
Clearance Time (s)	4.5	4.5	5.0			5.0
Vehicle Extension (s)	2.0	2.0	3.5			3.5
Lane Grp Cap (vph)	1290	1047	2899			2899
v/s Ratio Prot	0.15	c0.20	c0.25			0.18
v/s Ratio Perm						
v/c Ratio	0.41	0.55	0.45			0.33
Uniform Delay, d1	9.9	10.5	5.5			5.1
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.1	0.4	0.1			0.1
Delay (s)	9.9	10.9	5.7			5.2
Level of Service	A	B	A			A
Approach Delay (s)	10.5		5.7			5.2
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	7.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	41.5	Sum of lost time (s)	3.5
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	877	959	0	490	1205	0
Future Volume (vph)	877	959	0	490	1205	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.5	1.5		2.0	2.1	
Lane Util. Factor	0.97	0.88		0.91	0.91	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3547	2880		5255	5255	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3547	2880		5255	5255	
Peak-hour factor, PHF	0.96	0.96	0.90	0.90	0.90	0.90
Adj. Flow (vph)	914	999	0	544	1339	0
RTOR Reduction (vph)	0	49	0	0	0	0
Lane Group Flow (vph)	914	950	0	544	1339	0
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases	4					
Actuated Green, G (s)	19.8	19.8		22.2	22.2	
Effective Green, g (s)	22.8	22.8		25.2	25.1	
Actuated g/C Ratio	0.44	0.44		0.49	0.49	
Clearance Time (s)	4.5	4.5		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		3.5	3.5	
Lane Grp Cap (vph)	1570	1275		2571	2561	
v/s Ratio Prot	0.26	c0.33		0.10	c0.25	
v/s Ratio Perm						
v/c Ratio	0.58	0.75		0.21	0.52	
Uniform Delay, d1	10.8	11.9		7.5	9.1	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	2.1		0.0	0.2	
Delay (s)	11.1	14.0		7.5	9.3	
Level of Service	B	B		A	A	
Approach Delay (s)	12.7			7.5	9.3	
Approach LOS	B			A	A	

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	51.5	Sum of lost time (s)	3.6
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
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 (vph)	93	399	15	40	983	23	28	7	7	23	23	172
Future Volume (vph)	93	399	15	40	983	23	28	7	7	23	23	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1829	5255	1636	3547	5236		1829	1925	1636	1829	1925	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1829	5255	1636	3547	5236		1829	1925	1636	1829	1925	1636
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	103	443	17	44	1092	26	31	8	8	26	26	191
RTOR Reduction (vph)	0	0	7	0	1	0	0	0	7	0	0	166
Lane Group Flow (vph)	103	443	10	44	1117	0	31	8	1	26	26	25
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	10.8	65.3	65.3	4.4	58.9		4.7	15.6	15.6	3.2	14.1	14.1
Effective Green, g (s)	10.8	65.3	65.3	4.4	58.9		4.7	15.6	15.6	3.2	14.1	14.1
Actuated g/C Ratio	0.10	0.62	0.62	0.04	0.56		0.04	0.15	0.15	0.03	0.13	0.13
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	186	3237	1007	147	2909		81	283	240	55	256	217
v/s Ratio Prot	c0.06	0.08		0.01	c0.21		c0.02	0.00		0.01	0.01	
v/s Ratio Perm			0.01						0.00			c0.02
v/c Ratio	0.55	0.14	0.01	0.30	0.38		0.38	0.03	0.00	0.47	0.10	0.12
Uniform Delay, d1	45.3	8.5	7.9	49.3	13.3		49.2	38.7	38.6	50.6	40.4	40.5
Progression Factor	1.00	1.00	1.00	1.18	0.63		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.5	0.1	0.0	1.1	0.4		3.0	0.0	0.0	6.3	0.2	0.2
Delay (s)	48.8	8.6	7.9	59.4	8.7		52.2	38.7	38.6	56.9	40.6	40.7
Level of Service	D	A	A	E	A		D	D	D	E	D	D
Approach Delay (s)		16.0			10.6			47.6			42.4	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	106.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
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 (vph)	6	421	61	115	957	5	46	0	34	14	0	18
Future Volume (vph)	6	421	61	115	957	5	46	0	34	14	0	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.91		0.97	0.91			1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00			1.00	0.85		0.93	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.98	
Satd. Flow (prot)	1829	5155		3547	5250			1829	1636		1742	
Flt Permitted	0.95	1.00		0.95	1.00			0.83	1.00		0.88	
Satd. Flow (perm)	1829	5155		3547	5250			1588	1636		1572	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	7	468	68	128	1063	6	51	0	38	16	0	20
RTOR Reduction (vph)	0	10	0	0	0	0	0	0	33	0	31	0
Lane Group Flow (vph)	7	526	0	128	1069	0	0	51	5	0	5	0
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	1.4	69.2		9.2	77.0			14.1	14.1		14.1	
Effective Green, g (s)	1.4	69.2		9.2	77.0			14.1	14.1		14.1	
Actuated g/C Ratio	0.01	0.65		0.09	0.73			0.13	0.13		0.13	
Clearance Time (s)	4.0	5.5		4.0	5.5			4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	24	3365		307	3813			211	217		209	
v/s Ratio Prot	0.00	0.10		c0.04	c0.20							
v/s Ratio Perm								c0.03	0.00		0.00	
v/c Ratio	0.29	0.16		0.42	0.28			0.24	0.02		0.02	
Uniform Delay, d1	51.8	7.1		45.9	5.0			41.2	40.0		40.0	
Progression Factor	1.22	0.56		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	6.6	0.1		0.9	0.2			0.6	0.0		0.0	
Delay (s)	69.8	4.1		46.8	5.2			41.8	40.0		40.0	
Level of Service	E	A		D	A			D	D		D	
Approach Delay (s)		4.9			9.6			41.0			40.0	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	10.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	106.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	41.7%	ICU Level of Service	A
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 (vph)	108	134	212	460	502	31	421	770	189	34	1183	167
Future Volume (vph)	108	134	212	460	502	31	421	770	189	34	1183	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	5.0	5.0	6.0		5.0	6.0	5.0	5.0	6.0	6.0
Lane Util. Factor	0.97	0.91	0.88	0.94	0.91		0.94	0.91	0.88	0.97	0.86	0.88
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	2880	5157	5209		5157	5255	2880	3547	6621	2880
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	2880	5157	5209		5157	5255	2880	3547	6621	2880
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.94	0.94	0.94	0.92	0.92	0.92
Adj. Flow (vph)	117	146	230	500	546	34	448	819	201	37	1286	182
RTOR Reduction (vph)	0	0	56	0	5	0	0	0	92	0	0	115
Lane Group Flow (vph)	117	146	174	500	575	0	448	819	109	37	1286	67
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8	1	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	16.1	17.5	33.9	16.8	18.2		16.4	39.8	56.6	8.6	32.0	32.0
Effective Green, g (s)	16.1	17.5	33.9	16.8	18.2		16.4	39.8	56.6	8.6	32.0	32.0
Actuated g/C Ratio	0.15	0.17	0.32	0.16	0.17		0.16	0.38	0.54	0.08	0.31	0.31
Clearance Time (s)	5.0	6.0	5.0	5.0	6.0		5.0	6.0	5.0	5.0	6.0	6.0
Vehicle Extension (s)	2.0	3.0	2.0	2.0	3.0		2.0	4.0	2.0	2.0	4.0	4.0
Lane Grp Cap (vph)	545	878	932	827	905		807	1997	1556	291	2023	880
v/s Ratio Prot	0.03	0.03	0.03	c0.10	c0.11		c0.09	0.16	0.01	0.01	c0.19	
v/s Ratio Perm			0.03						0.03			0.02
v/c Ratio	0.21	0.17	0.19	0.60	0.64		0.56	0.41	0.07	0.13	0.64	0.08
Uniform Delay, d1	38.8	37.4	25.5	40.9	40.2		40.8	23.8	11.5	44.6	31.3	25.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.1	0.0	0.9	1.5		0.5	0.2	0.0	0.1	0.7	0.1
Delay (s)	38.8	37.4	25.5	41.7	41.6		41.3	24.0	11.5	44.6	32.1	25.9
Level of Service	D	D	C	D	D		D	C	B	D	C	C
Approach Delay (s)		32.2			41.7			27.6			31.6	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	32.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	104.7	Sum of lost time (s)	22.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	541	255	1374	0	0	1181
Future Volume (vph)	541	255	1374	0	0	1181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.1	2.1	2.0			2.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	5255			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	5255			5255
Peak-hour factor, PHF	0.96	0.96	0.94	0.94	0.90	0.90
Adj. Flow (vph)	564	266	1462	0	0	1312
RTOR Reduction (vph)	0	40	0	0	0	0
Lane Group Flow (vph)	564	226	1462	0	0	1312
Turn Type	Prot	Perm	NA			NA
Protected Phases	4		6			2
Permitted Phases	4	4				
Actuated Green, G (s)	12.0	12.0	21.5			21.5
Effective Green, g (s)	14.0	14.0	24.5			24.5
Actuated g/C Ratio	0.33	0.33	0.58			0.58
Clearance Time (s)	4.1	4.1	5.0			5.0
Vehicle Extension (s)	3.0	3.0	3.5			3.5
Lane Grp Cap (vph)	1165	946	3022			3022
v/s Ratio Prot	c0.16		c0.28			0.25
v/s Ratio Perm		0.08				
v/c Ratio	0.48	0.24	0.48			0.43
Uniform Delay, d1	11.4	10.4	5.3			5.1
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.3	0.1	0.1			0.1
Delay (s)	11.7	10.6	5.5			5.2
Level of Service	B	B	A			A
Approach Delay (s)	11.4		5.5			5.2
Approach LOS	B		A			A

Intersection Summary			
HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	42.6	Sum of lost time (s)	6.5
Intersection Capacity Utilization	78.5%	ICU Level of Service	D
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 (vph)	676	153	745	185	0	346	0	933	94	165	1069	0
Future Volume (vph)	676	153	745	185	0	346	0	933	94	165	1069	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5		4.5		5.0	5.0	4.5	5.0	
Lane Util. Factor	0.97	1.00	1.00	0.97		0.88		0.91	1.00	0.97	0.95	
Frt	1.00	1.00	0.85	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3547	1925	1636	3547		2880		5255	1636	3547	3657	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3547	1925	1636	3547		2880		5255	1636	3547	3657	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.91	0.91	0.91	0.94	0.94	0.94
Adj. Flow (vph)	727	165	801	199	0	372	0	1025	103	176	1137	0
RTOR Reduction (vph)	0	0	63	0	0	0	0	0	76	0	0	0
Lane Group Flow (vph)	727	165	738	199	0	372	0	1025	27	176	1137	0
Turn Type	Split	NA	Perm	Prot		pt+ov		NA	Perm	Prot	NA	
Protected Phases	4	4		8		1 8		2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	40.6	40.6	40.6	8.1		21.6		26.9	26.9	9.0	40.4	
Effective Green, g (s)	40.6	40.6	40.6	8.1		21.6		26.9	26.9	9.0	40.4	
Actuated g/C Ratio	0.39	0.39	0.39	0.08		0.21		0.26	0.26	0.09	0.39	
Clearance Time (s)	4.5	4.5	4.5	4.5				5.0	5.0	4.5	5.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0				3.5	3.5	2.0	3.5	
Lane Grp Cap (vph)	1396	758	644	278		603		1371	426	309	1433	
v/s Ratio Prot	0.20	0.09		0.06		c0.13		0.20		0.05	c0.31	
v/s Ratio Perm			c0.45						0.02			
v/c Ratio	0.52	0.22	1.15	0.72		0.62		0.75	0.06	0.57	0.79	
Uniform Delay, d1	23.8	20.7	31.2	46.4		37.0		35.0	28.6	45.2	27.7	
Progression Factor	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.1	83.0	7.1		1.3		2.3	0.1	1.4	3.2	
Delay (s)	24.0	20.8	114.3	53.5		38.3		37.3	28.7	46.6	30.9	
Level of Service	C	C	F	D		D		D	C	D	C	
Approach Delay (s)		66.4			43.6			36.5			33.0	
Approach LOS		E			D			D			C	

Intersection Summary			
HCM 2000 Control Delay	47.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	103.1	Sum of lost time (s)	18.5
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
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 (vph)	77	182	103	233	363	157	11	110	41	39	377	81
Future Volume (vph)	77	182	103	233	363	157	11	110	41	39	377	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1		4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	
Lane Util. Factor	1.00	1.00		0.97	0.95	1.00	1.00	0.91	0.91	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	0.99	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1829	1812		3547	3657	1612	1829	3485	1489	1829	3560	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1829	1812		3547	3657	1612	1829	3485	1489	1829	3560	
Peak-hour factor, PHF	0.78	0.78	0.78	0.68	0.68	0.68	0.97	0.97	0.97	0.81	0.81	0.81
Adj. Flow (vph)	99	233	132	343	534	231	11	113	42	48	465	100
RTOR Reduction (vph)	0	22	0	0	0	167	0	2	21	0	15	0
Lane Group Flow (vph)	99	343	0	343	534	64	11	115	17	48	550	0
Confl. Peds. (#/hr)			1			2						
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	6.9	23.0		11.8	27.9	27.9	1.4	44.4	44.4	4.4	47.4	
Effective Green, g (s)	6.9	23.0		11.8	27.9	27.9	1.4	44.4	44.4	4.4	47.4	
Actuated g/C Ratio	0.07	0.23		0.12	0.28	0.28	0.01	0.44	0.44	0.04	0.47	
Clearance Time (s)	4.1	4.1		4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	126	416		418	1020	449	25	1547	661	80	1687	
v/s Ratio Prot	0.05	c0.19		c0.10	0.15		0.01	0.03		c0.03	c0.15	
v/s Ratio Perm						0.04			0.01			
v/c Ratio	0.79	0.83		0.82	0.52	0.14	0.44	0.07	0.03	0.60	0.33	
Uniform Delay, d1	45.8	36.6		43.1	30.4	27.1	48.9	16.0	15.6	46.9	16.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	26.7	12.6		12.2	0.5	0.1	11.9	0.1	0.1	11.5	0.5	
Delay (s)	72.6	49.2		55.2	30.9	27.2	60.8	16.1	15.7	58.5	16.9	
Level of Service	E	D		E	C	C	E	B	B	E	B	
Approach Delay (s)		54.2			37.7			19.0			20.1	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	53.6%	ICU Level of Service	A
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		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	78	0	0	255	8	46	2	131	24	88	273	3
Future Volume (vph)	78	0	0	255	8	46	2	131	24	88	273	3
Peak Hour Factor	0.25	0.25	0.25	0.77	0.77	0.77	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	312	0	0	331	10	60	2	154	28	104	321	4

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total (vph)	312	341	60	79	105	429
Volume Left (vph)	312	331	0	2	0	104
Volume Right (vph)	0	0	60	0	28	4
Hadj (s)	0.23	0.23	-0.57	0.05	-0.15	0.08
Departure Headway (s)	7.4	7.3	3.2	8.2	8.0	7.0
Degree Utilization, x	0.64	0.69	0.05	0.18	0.23	0.84
Capacity (veh/h)	450	464	1121	387	403	429
Control Delay (s)	22.5	24.9	6.4	11.7	12.1	36.8
Approach Delay (s)	22.5	22.1		12.0		36.8
Approach LOS	C	C		B		E

Intersection Summary			
Delay	25.6		
Level of Service	D		
Intersection Capacity Utilization	50.7%	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)	126	188	29	134	529	314	29	207	86	646	957	748
Future Volume (vph)	126	188	29	134	529	314	29	207	86	646	957	748
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	1636	3547	5255	1636	3547	5255	1636	3547	5255	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	1636	3547	5255	1636	3547	5255	1636	3547	5255	1636
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.87	0.92	0.93
Adj. Flow (vph)	148	221	34	158	622	369	34	244	101	743	1040	804
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	148	221	34	158	622	369	34	244	101	743	1040	804
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			Free			Free			Free			Free
Actuated Green, G (s)	7.2	17.1	79.6	7.2	17.1	79.6	2.2	17.5	79.6	17.8	33.1	79.6
Effective Green, g (s)	8.2	20.1	79.6	8.2	20.1	79.6	3.2	20.5	79.6	18.8	36.1	79.6
Actuated g/C Ratio	0.10	0.25	1.00	0.10	0.25	1.00	0.04	0.26	1.00	0.24	0.45	1.00
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	365	1326	1636	365	1326	1636	142	1353	1636	837	2383	1636
v/s Ratio Prot	0.04	0.04		0.04	0.12		0.01	0.05		c0.21	0.20	
v/s Ratio Perm			0.02			0.23			0.06			c0.49
v/c Ratio	0.41	0.17	0.02	0.43	0.47	0.23	0.24	0.18	0.06	0.89	0.44	0.49
Uniform Delay, d1	33.4	23.2	0.0	33.5	25.2	0.0	37.0	23.0	0.0	29.4	14.8	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.1	0.0	0.8	0.3	0.3	0.9	0.1	0.1	11.2	0.1	1.1
Delay (s)	34.2	23.3	0.0	34.3	25.5	0.3	37.9	23.1	0.1	40.6	14.9	1.1
Level of Service	C	C	A	C	C	A	D	C	A	D	B	A
Approach Delay (s)		25.3			18.6			18.3			18.0	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	79.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
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 (vph)	10	21	40	57	0	792	86	1926	15	228	1541	32
Future Volume (vph)	10	21	40	57	0	792	86	1926	15	228	1541	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5		4.0		4.0	3.5	5.0		3.5	5.0	5.0
Lane Util. Factor		1.00		1.00		0.88	1.00	0.91		1.00	0.95	1.00
Frt		0.92		1.00		0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected		0.99		0.95		1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1766		1829		2880	1829	5249		1829	3657	1636
Flt Permitted		0.97		0.54		1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1723		1047		2880	1829	5249		1829	3657	1636
Peak-hour factor, PHF	0.60	0.60	0.60	0.92	0.92	0.92	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	17	35	67	62	0	861	92	2071	16	248	1675	35
RTOR Reduction (vph)	0	39	0	0	0	410	0	0	0	0	0	13
Lane Group Flow (vph)	0	80	0	62	0	451	92	2087	0	248	1675	22
Turn Type	Perm	NA		Perm		Perm	Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						6
Actuated Green, G (s)		24.5		24.0		24.0	10.0	72.5		21.0	83.5	83.5
Effective Green, g (s)		24.5		24.0		24.0	10.0	72.5		21.0	83.5	83.5
Actuated g/C Ratio		0.19		0.18		0.18	0.08	0.56		0.16	0.64	0.64
Clearance Time (s)		3.5		4.0		4.0	3.5	5.0		3.5	5.0	5.0
Vehicle Extension (s)		2.0		2.0		2.0	2.0	4.0		2.0	4.0	4.0
Lane Grp Cap (vph)		324		193		531	140	2927		295	2348	1050
v/s Ratio Prot							0.05	0.40		c0.14	c0.46	
v/s Ratio Perm		0.05		0.06		c0.16						0.01
v/c Ratio		0.25		0.32		0.85	0.66	0.71		0.84	0.71	0.02
Uniform Delay, d1		44.9		45.9		51.2	58.3	21.1		52.9	15.3	8.4
Progression Factor		1.00		0.95		0.98	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.1		0.3		9.9	8.2	1.5		18.3	1.1	0.0
Delay (s)		45.0		43.9		60.2	66.5	22.6		71.1	16.5	8.4
Level of Service		D		D		E	E	C		E	B	A
Approach Delay (s)		45.0			59.1			24.5			23.3	
Approach LOS		D			E			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
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 (vph)	188	1016	799	783	1388	524	926	1766	433	330	1292	113
Future Volume (vph)	188	1016	799	783	1388	524	926	1766	433	330	1292	113
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	5.0	5.0	5.5	5.5	5.0	5.5	5.5	5.0	5.5	
Lane Util. Factor	0.97	0.91	0.88	0.94	0.91	1.00	0.94	0.91	0.88	0.97	0.86	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3547	5255	2880	5157	5255	1636	5157	5255	2880	3547	6541	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3547	5255	2880	5157	5255	1636	5157	5255	2880	3547	6541	
Peak-hour factor, PHF	0.92	0.92	0.92	0.97	0.97	0.97	0.97	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	204	1104	868	807	1431	540	955	1821	446	359	1404	123
RTOR Reduction (vph)	0	0	47	0	0	159	0	0	279	0	8	0
Lane Group Flow (vph)	204	1104	821	807	1431	381	955	1821	167	359	1519	0
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2			6			8			
Actuated Green, G (s)	11.6	37.4	70.6	26.7	53.0	53.0	33.2	59.0	59.0	17.8	43.6	
Effective Green, g (s)	11.6	37.4	70.6	26.7	53.0	53.0	33.2	59.0	59.0	17.8	43.6	
Actuated g/C Ratio	0.07	0.23	0.43	0.16	0.33	0.33	0.20	0.36	0.36	0.11	0.27	
Clearance Time (s)	5.0	6.0	5.0	5.0	5.5	5.5	5.0	5.5	5.5	5.0	5.5	
Vehicle Extension (s)	2.0	4.5	2.0	2.0	4.5	4.5	2.0	4.5	4.5	2.0	4.5	
Lane Grp Cap (vph)	253	1210	1252	847	1714	533	1054	1909	1046	388	1756	
v/s Ratio Prot	0.06	c0.21	0.13	c0.16	0.27		c0.19	c0.35		0.10	0.23	
v/s Ratio Perm			0.15			0.23			0.06			
v/c Ratio	0.81	0.91	0.66	0.95	0.83	0.71	0.91	0.95	0.16	0.93	0.87	
Uniform Delay, d1	74.3	60.9	36.3	67.2	50.6	48.1	63.1	50.4	34.9	71.6	56.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	16.0	10.8	1.0	20.1	4.0	5.2	10.8	11.7	0.1	27.2	5.0	
Delay (s)	90.3	71.7	37.2	87.3	54.7	53.2	73.8	62.1	35.1	98.8	61.6	
Level of Service	F	E	D	F	D	D	E	E	D	F	E	
Approach Delay (s)		59.7			63.9			61.8			68.7	
Approach LOS		E			E			E			E	

Intersection Summary			
HCM 2000 Control Delay	63.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	162.4	Sum of lost time (s)	21.5
Intersection Capacity Utilization	98.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	381	891	2286	0	0	1736
Future Volume (vph)	381	891	2286	0	0	1736
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0			3.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	5255			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	5255			5255
Peak-hour factor, PHF	0.92	0.92	0.96	0.96	0.95	0.97
Adj. Flow (vph)	414	968	2381	0	0	1790
RTOR Reduction (vph)	0	2	0	0	0	0
Lane Group Flow (vph)	414	966	2381	0	0	1790
Turn Type	Prot	Prot	NA			NA
Protected Phases	4	4	2			6
Permitted Phases	4					
Actuated Green, G (s)	20.0	20.0	28.0			28.0
Effective Green, g (s)	23.0	23.0	31.0			31.0
Actuated g/C Ratio	0.38	0.38	0.52			0.52
Clearance Time (s)	6.0	6.0	6.0			6.0
Vehicle Extension (s)	5.0	5.0	5.0			1.8
Lane Grp Cap (vph)	1359	1104	2715			2715
v/s Ratio Prot	0.12	c0.34	c0.45			0.34
v/s Ratio Perm						
v/c Ratio	0.30	0.88	0.88			0.66
Uniform Delay, d1	12.9	17.2	12.8			10.6
Progression Factor	1.00	1.00	0.80			1.00
Incremental Delay, d2	0.3	8.6	1.7			1.3
Delay (s)	13.2	25.7	12.0			11.9
Level of Service	B	C	B			B
Approach Delay (s)	22.0		12.0			11.9
Approach LOS	C		B			B

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	152.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1329	1082	0	2610	1763	0
Future Volume (vph)	1329	1082	0	2610	1763	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0	
Lane Util. Factor	0.97	0.88		0.91	0.91	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3547	2880		5255	5255	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3547	2880		5255	5255	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	1414	1151	0	2777	1876	0
RTOR Reduction (vph)	0	3	0	0	0	0
Lane Group Flow (vph)	1414	1148	0	2777	1876	0
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases	4			2		
Actuated Green, G (s)	24.0	24.0		24.0	24.0	
Effective Green, g (s)	27.0	27.0		27.0	27.0	
Actuated g/C Ratio	0.45	0.45		0.45	0.45	
Clearance Time (s)	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	1.8	1.8		5.0	5.0	
Lane Grp Cap (vph)	1596	1296		2364	2364	
v/s Ratio Prot	c0.40	0.40		c0.53	0.36	
v/s Ratio Perm						
v/c Ratio	0.89	0.89		1.17	0.79	
Uniform Delay, d1	15.1	15.1		16.5	14.1	
Progression Factor	1.00	1.00		1.00	1.62	
Incremental Delay, d2	6.1	7.4		83.4	2.5	
Delay (s)	21.2	22.5		99.9	25.4	
Level of Service	C	C		F	C	
Approach Delay (s)	21.8			99.9	25.4	
Approach LOS	C			F	C	

Intersection Summary			
HCM 2000 Control Delay	52.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	138.5%	ICU Level of Service	H
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 (vph)	14	2114	27	59	2578	766	95	0	57	257	0	20
Future Volume (vph)	14	2114	27	59	2578	766	95	0	57	257	0	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.9	5.0	3.4	4.9	6.0	3.0	5.0		4.1	4.1	
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	1.00	1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1829	5255	1636	1829	5255	1636	1829	1636		3547	1636	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1829	5255	1636	1829	5255	1636	1829	1636		3547	1636	
Peak-hour factor, PHF	0.90	0.97	0.89	0.92	0.97	0.92	0.77	0.90	0.77	0.92	0.90	0.90
Adj. Flow (vph)	16	2179	30	64	2658	833	123	0	74	279	0	22
RTOR Reduction (vph)	0	0	13	0	0	311	0	64	0	0	20	0
Lane Group Flow (vph)	16	2179	17	64	2658	522	123	10	0	279	2	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)	2.8	72.3	72.3	11.9	81.4	81.4	14.7	17.3		8.9	12.4	
Effective Green, g (s)	2.8	73.4	73.3	13.0	82.5	81.4	15.8	17.3		8.9	12.4	
Actuated g/C Ratio	0.02	0.56	0.56	0.10	0.63	0.63	0.12	0.13		0.07	0.10	
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0	6.0	4.1	5.0		4.1	4.1	
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5	4.5	3.0	4.5		3.0	3.0	
Lane Grp Cap (vph)	39	2967	922	182	3334	1024	222	217		242	156	
v/s Ratio Prot	0.01	c0.41		0.03	c0.51		c0.07	c0.01		c0.08	0.00	
v/s Ratio Perm			0.01			0.32						
v/c Ratio	0.41	0.73	0.02	0.35	0.80	0.51	0.55	0.05		1.15	0.01	
Uniform Delay, d1	62.8	21.0	12.5	54.6	17.6	13.3	53.8	49.1		60.5	53.3	
Progression Factor	1.00	1.00	1.00	0.98	0.98	2.44	1.00	1.00		1.07	1.00	
Incremental Delay, d2	2.5	1.7	0.0	0.2	1.2	1.0	3.0	0.1		98.2	0.0	
Delay (s)	65.3	22.7	12.5	53.5	18.3	33.5	56.8	49.3		163.1	53.3	
Level of Service	E	C	B	D	B	C	E	D		F	D	
Approach Delay (s)		22.9			22.5			54.0			155.1	
Approach LOS		C			C			D			F	

Intersection Summary			
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.5
Intersection Capacity Utilization	71.3%	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 (vph)	17	1994	209	103	3273	0	114	0	68	0	0	0
Future Volume (vph)	17	1994	209	103	3273	0	114	0	68	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0		4.5	4.5				
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91		1.00	1.00				
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.85				
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00				
Satd. Flow (prot)	3547	5255	1636	1829	5255		1829	1636				
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00				
Satd. Flow (perm)	3547	5255	1636	1829	5255		1829	1636				
Peak-hour factor, PHF	0.91	0.97	0.92	0.94	0.97	0.94	0.92	0.92	0.92	0.25	0.25	0.25
Adj. Flow (vph)	19	2056	227	110	3374	0	124	0	74	0	0	0
RTOR Reduction (vph)	0	0	48	0	0	0	0	66	0	0	0	0
Lane Group Flow (vph)	19	2056	179	110	3374	0	124	8	0	0	0	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	2.3	87.9	87.9	13.7	99.3		13.4	13.4				
Effective Green, g (s)	2.3	87.9	87.9	13.7	99.3		13.4	13.4				
Actuated g/C Ratio	0.02	0.68	0.68	0.11	0.76		0.10	0.10				
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0		4.5	4.5				
Vehicle Extension (s)	2.0	4.5	4.5	2.0	4.5		2.0	2.0				
Lane Grp Cap (vph)	62	3553	1106	192	4014		188	168				
v/s Ratio Prot	0.01	0.39		c0.06	c0.64		c0.07	0.00				
v/s Ratio Perm			0.11									
v/c Ratio	0.31	0.58	0.16	0.57	0.84		0.66	0.05				
Uniform Delay, d1	63.1	11.2	7.7	55.4	10.1		56.1	52.5				
Progression Factor	1.00	0.54	0.60	0.95	0.86		1.00	1.00				
Incremental Delay, d2	0.7	0.5	0.2	1.1	1.0		6.2	0.0				
Delay (s)	63.7	6.5	4.8	53.7	9.7		62.3	52.6				
Level of Service	E	A	A	D	A		E	D				
Approach Delay (s)		6.8			11.1			58.7			0.0	
Approach LOS		A			B			E			A	

Intersection Summary			
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
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 (vph)	10	1838	229	156	2510	10	756	0	86	40	10	110
Future Volume (vph)	10	1838	229	156	2510	10	756	0	86	40	10	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	5.5	5.5	4.5	5.5	5.5	4.1	4.5		4.1	4.1	4.1
Lane Util. Factor	1.00	0.91	1.00	1.00	0.91	1.00	0.97	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1829	5255	1636	1829	5255	1636	3547	1636		1829	1925	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1829	5255	1636	1829	5255	1636	3547	1636		1829	1925	1636
Peak-hour factor, PHF	0.92	0.97	0.94	0.93	0.97	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	1895	244	168	2588	11	822	0	93	43	11	120
RTOR Reduction (vph)	0	0	89	0	0	5	0	68	0	0	0	108
Lane Group Flow (vph)	11	1895	155	168	2588	6	822	25	0	43	11	12
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	1.4	56.3	56.3	13.9	69.2	69.2	28.9	35.0		6.2	12.7	12.7
Effective Green, g (s)	1.4	56.3	56.3	13.9	69.2	69.2	28.9	35.0		6.2	12.7	12.7
Actuated g/C Ratio	0.01	0.43	0.43	0.11	0.53	0.53	0.22	0.27		0.05	0.10	0.10
Clearance Time (s)	4.1	5.5	5.5	4.5	5.5	5.5	4.1	4.5		4.1	4.1	4.1
Vehicle Extension (s)	3.0	4.5	4.5	2.0	4.5	4.5	3.0	2.0		3.0	3.0	3.0
Lane Grp Cap (vph)	19	2275	708	195	2797	870	788	440		87	188	159
v/s Ratio Prot	0.01	0.36		c0.09	c0.49		c0.23	0.02		0.02	0.01	
v/s Ratio Perm			0.09			0.00						c0.01
v/c Ratio	0.58	0.83	0.22	0.86	0.93	0.01	1.04	0.06		0.49	0.06	0.07
Uniform Delay, d1	64.0	32.7	23.1	57.1	28.0	14.3	50.5	35.3		60.4	53.2	53.3
Progression Factor	1.35	0.50	0.29	1.14	0.70	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	31.1	3.2	0.6	17.0	3.6	0.0	43.9	0.0		4.4	0.1	0.2
Delay (s)	117.3	19.4	7.4	82.3	23.2	14.3	94.4	35.3		64.7	53.4	53.5
Level of Service	F	B	A	F	C	B	F	D		E	D	D
Approach Delay (s)		18.5			26.7			88.4			56.3	
Approach LOS		B			C			F			E	

Intersection Summary			
HCM 2000 Control Delay	34.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.6
Intersection Capacity Utilization	92.6%	ICU Level of Service	F
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 (vph)	335	1328	371	140	1778	33	432	163	396	46	153	466
Future Volume (vph)	335	1328	371	140	1778	33	432	163	396	46	153	466
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	5.5	4.5	4.5	5.5	5.5	4.5	5.0	4.5	4.5	5.0	4.5
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	1636	3547	5255	1636	3547	1925	1636	1829	1925	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	1636	3547	5255	1636	3547	1925	1636	1829	1925	1636
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	345	1369	382	144	1833	34	445	168	408	47	158	480
RTOR Reduction (vph)	0	0	147	0	0	21	0	0	65	0	0	97
Lane Group Flow (vph)	345	1369	235	144	1833	13	445	168	343	47	158	383
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6		3	8	1	7	4	5
Permitted Phases			2			6			8			4
Actuated Green, G (s)	19.8	61.5	80.1	8.5	50.2	50.2	18.6	34.3	42.8	6.2	21.9	41.7
Effective Green, g (s)	19.8	61.5	80.1	8.5	50.2	50.2	18.6	34.3	42.8	6.2	21.9	41.7
Actuated g/C Ratio	0.15	0.47	0.62	0.07	0.39	0.39	0.14	0.26	0.33	0.05	0.17	0.32
Clearance Time (s)	4.5	5.5	4.5	4.5	5.5	5.5	4.5	5.0	4.5	4.5	5.0	4.5
Vehicle Extension (s)	2.0	4.5	2.0	2.0	4.5	4.5	2.0	4.0	2.0	2.0	4.0	2.0
Lane Grp Cap (vph)	540	2486	1008	231	2029	631	507	507	538	87	324	524
v/s Ratio Prot	0.10	0.26	0.03	0.04	c0.35		c0.13	0.09	0.04	0.03	0.08	c0.11
v/s Ratio Perm			0.11			0.01			0.17			0.12
v/c Ratio	0.64	0.55	0.23	0.62	0.90	0.02	0.88	0.33	0.64	0.54	0.49	0.73
Uniform Delay, d1	51.7	24.4	11.2	59.2	37.6	24.7	54.6	38.6	37.0	60.5	49.0	39.2
Progression Factor	1.27	1.48	3.34	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	0.6	0.0	3.7	7.1	0.1	15.3	0.5	1.8	3.6	1.6	4.5
Delay (s)	66.7	36.7	37.4	62.9	44.7	24.8	69.9	39.1	38.8	64.1	50.5	43.7
Level of Service	E	D	D	E	D	C	E	D	D	E	D	D
Approach Delay (s)		41.8			45.7			52.4			46.7	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	45.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.5
Intersection Capacity Utilization	87.6%	ICU Level of Service	E
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 (vph)	0	0	0	176	0	1	0	385	107	5	452	0
Future Volume (vph)	0	0	0	176	0	1	0	385	107	5	452	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				3.0	4.1			3.0	3.1	3.0	3.0	
Lane Util. Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Frt				1.00	0.85			1.00	0.85	1.00	1.00	
Flt Protected				0.95	1.00			1.00	1.00	0.95	1.00	
Satd. Flow (prot)				1829	1636			1925	1636	1829	1925	
Flt Permitted				0.95	1.00			1.00	1.00	0.47	1.00	
Satd. Flow (perm)				1829	1636			1925	1636	911	1925	
Peak-hour factor, PHF	0.90	0.90	0.90	0.92	0.90	0.82	0.90	0.93	0.93	0.85	0.92	0.90
Adj. Flow (vph)	0	0	0	191	0	1	0	414	115	6	491	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	34	0	0	0
Lane Group Flow (vph)	0	0	0	191	0	0	0	414	81	6	491	0
Turn Type	Prot			Prot	NA		Prot	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases									2	6		6
Actuated Green, G (s)				17.7	28.2			83.6	83.6	83.6	83.6	
Effective Green, g (s)				18.8	28.2			84.7	84.6	84.7	84.7	
Actuated g/C Ratio				0.16	0.23			0.71	0.70	0.71	0.71	
Clearance Time (s)				4.1	4.1			4.1	4.1	4.1	4.1	
Vehicle Extension (s)				3.0	3.0			3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)				286	384			1358	1153	643	1358	
v/s Ratio Prot				c0.10	c0.00			0.22			c0.26	
v/s Ratio Perm									0.05	0.01		
v/c Ratio				0.67	0.00			0.30	0.07	0.01	0.36	
Uniform Delay, d1				47.7	35.1			6.6	5.5	5.2	7.0	
Progression Factor				1.00	1.00			1.00	1.00	1.00	1.00	
Incremental Delay, d2				5.8	0.0			0.6	0.1	0.0	0.7	
Delay (s)				53.5	35.1			7.2	5.6	5.3	7.7	
Level of Service				D	D			A	A	A	A	
Approach Delay (s)		0.0			53.4			6.9			7.7	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	15.3
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
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 (vph)	0	346	20	118	260	0	13	0	339	0	0	0
Future Volume (vph)	0	346	20	118	260	0	13	0	339	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.1	3.0	3.4		3.0		3.0			
Lane Util. Factor		0.95	1.00	1.00	0.95		1.00		1.00			
Frt		1.00	0.85	1.00	1.00		1.00		0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (prot)		3657	1636	1829	3657		1829		1636			
Flt Permitted		1.00	1.00	0.95	1.00		0.95		1.00			
Satd. Flow (perm)		3657	1636	1829	3657		1829		1636			
Peak-hour factor, PHF	0.90	0.97	0.97	0.92	0.92	0.90	0.85	0.90	0.92	0.90	0.90	0.90
Adj. Flow (vph)	0	357	21	128	283	0	15	0	368	0	0	0
RTOR Reduction (vph)	0	0	13	0	0	0	0	0	290	0	0	0
Lane Group Flow (vph)	0	357	8	128	283	0	15	0	78	0	0	0
Turn Type		NA	Perm	Prot	NA		Prot		custom			
Protected Phases		4		3	8		2					
Permitted Phases			4						2			
Actuated Green, G (s)		14.7	14.7	7.4	25.8		7.8		7.8			
Effective Green, g (s)		15.8	15.7	8.5	26.9		8.9		8.9			
Actuated g/C Ratio		0.37	0.37	0.20	0.64		0.21		0.21			
Clearance Time (s)		4.1	4.1	4.1	4.5		4.1		4.1			
Vehicle Extension (s)		3.0	3.0	3.0	3.0		3.0		3.0			
Lane Grp Cap (vph)		1369	608	368	2331		385		345			
v/s Ratio Prot		c0.10		c0.07	0.08		0.01					
v/s Ratio Perm			0.00						c0.05			
v/c Ratio		0.26	0.01	0.35	0.12		0.04		0.22			
Uniform Delay, d1		9.2	8.4	14.5	3.0		13.2		13.8			
Progression Factor		1.00	1.00	1.00	1.00		1.00		1.00			
Incremental Delay, d2		0.1	0.0	0.6	0.0		0.0		0.3			
Delay (s)		9.3	8.4	15.0	3.0		13.3		14.1			
Level of Service		A	A	B	A		B		B			
Approach Delay (s)		9.2			6.8			14.1			0.0	
Approach LOS		A			A			B			A	

Intersection Summary			
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	42.2	Sum of lost time (s)	9.0
Intersection Capacity Utilization	37.2%	ICU Level of Service	A
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 (vph)	143	1496	211	293	1005	37	818	607	500	83	567	92
Future Volume (vph)	143	1496	211	293	1005	37	818	607	500	83	567	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	6.0	5.0	4.5	6.0	6.0	5.0	6.0	6.0	4.5	5.5	5.5
Lane Util. Factor	0.97	0.91	0.88	0.97	0.91	1.00	0.94	0.91	1.00	0.97	0.91	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.98	1.00	1.00	0.97	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	2848	3547	5255	1600	5157	5255	1593	3547	5255	1611
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	2848	3547	5255	1600	5157	5255	1593	3547	5255	1611
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	149	1558	220	305	1047	39	852	632	521	86	591	96
RTOR Reduction (vph)	0	0	43	0	0	25	0	0	130	0	0	78
Lane Group Flow (vph)	149	1558	177	305	1047	14	852	632	391	86	591	18
Confl. Peds. (#/hr)			5			9			13			4
Confl. Bikes (#/hr)			1			1			1			
Turn Type	Prot	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8		7	4	
Permitted Phases			2			6			8			4
Actuated Green, G (s)	9.1	39.3	59.5	9.7	39.9	39.9	20.2	36.9	36.9	4.5	21.2	21.2
Effective Green, g (s)	9.1	39.3	59.5	9.7	39.9	39.9	20.2	36.9	36.9	4.5	21.2	21.2
Actuated g/C Ratio	0.08	0.35	0.53	0.09	0.36	0.36	0.18	0.33	0.33	0.04	0.19	0.19
Clearance Time (s)	4.5	6.0	5.0	4.5	6.0	6.0	5.0	6.0	6.0	4.5	5.5	5.5
Vehicle Extension (s)	2.0	3.5	2.0	2.0	3.5	3.5	2.0	3.5	3.5	2.0	3.5	3.5
Lane Grp Cap (vph)	289	1853	1521	308	1882	573	935	1740	527	143	1000	306
v/s Ratio Prot	0.04	c0.30	0.02	c0.09	0.20		c0.17	0.12		0.02	0.11	
v/s Ratio Perm			0.04			0.01			c0.25			0.01
v/c Ratio	0.52	0.84	0.12	0.99	0.56	0.02	0.91	0.36	0.74	0.60	0.59	0.06
Uniform Delay, d1	49.0	33.2	12.9	50.8	28.7	23.1	44.7	28.3	33.0	52.6	41.1	36.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	3.7	0.0	48.4	1.2	0.1	12.6	0.2	5.7	4.8	1.0	0.1
Delay (s)	49.7	36.9	12.9	99.2	29.8	23.2	57.3	28.5	38.8	57.4	42.1	37.0
Level of Service	D	D	B	F	C	C	E	C	D	E	D	D
Approach Delay (s)		35.1			44.9			43.4			43.2	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	41.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	111.4	Sum of lost time (s)	21.0
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
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 (vph)	82	32	928	213	53	25	1139	1962	368	64	729	253
Future Volume (vph)	82	32	928	213	53	25	1139	1962	368	64	729	253
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1	4.1	4.1	4.1		4.1	4.1	4.1	4.1	4.1	
Lane Util. Factor	1.00	0.91	0.91	0.97	1.00		0.94	0.91	1.00	0.97	0.86	
Frt	1.00	0.87	0.85	1.00	0.95		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1829	1515	2978	3547	1832		5157	5255	1636	3547	6365	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1829	1515	2978	3547	1832		5157	5255	1636	3547	6365	
Peak-hour factor, PHF	0.92	0.92	0.92	0.93	0.93	0.93	1.00	0.97	0.97	0.92	0.92	0.92
Adj. Flow (vph)	89	35	1009	229	57	27	1139	2023	379	70	792	275
RTOR Reduction (vph)	0	137	248	0	15	0	0	0	173	0	48	0
Lane Group Flow (vph)	89	211	448	229	69	0	1139	2023	206	70	1019	0
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	pm+ov	Prot	NA	
Protected Phases	7	4		3	8		5	2	3	1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	8.0	38.5	38.5	8.0	38.5		27.4	60.7	68.7	6.4	39.7	
Effective Green, g (s)	8.0	38.5	38.5	8.0	38.5		27.4	60.7	68.7	6.4	39.7	
Actuated g/C Ratio	0.06	0.30	0.30	0.06	0.30		0.21	0.47	0.53	0.05	0.31	
Clearance Time (s)	4.1	4.1	4.1	4.1	4.1		4.1	4.1	4.1	4.1	4.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	112	448	881	218	542		1086	2453	916	174	1943	
v/s Ratio Prot	0.05	0.14		c0.06	0.04		c0.22	c0.38	0.01	0.02	0.16	
v/s Ratio Perm			c0.15						0.11			
v/c Ratio	0.79	0.47	0.51	1.05	0.13		1.05	0.82	0.22	0.40	0.52	
Uniform Delay, d1	60.2	37.4	37.9	61.0	33.5		51.3	30.0	16.4	59.9	37.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	31.0	0.8	0.5	74.9	0.1		41.0	3.3	0.1	1.5	1.0	
Delay (s)	91.2	38.2	38.4	135.9	33.6		92.3	33.4	16.5	61.5	38.4	
Level of Service	F	D	D	F	C		F	C	B	E	D	
Approach Delay (s)		42.5			108.4			50.5			39.8	
Approach LOS		D			F			D			D	

Intersection Summary			
HCM 2000 Control Delay	50.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	423	544	2694	0	0	1044
Future Volume (vph)	423	544	2694	0	0	1044
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.5	1.5	2.0			2.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frpb, ped/bikes	1.00	1.00	1.00			1.00
Flpb, ped/bikes	1.00	1.00	1.00			1.00
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	5255			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	5255			5255
Peak-hour factor, PHF	0.92	0.92	0.91	0.91	0.95	0.95
Adj. Flow (vph)	460	591	2960	0	0	1099
RTOR Reduction (vph)	0	5	0	0	0	0
Lane Group Flow (vph)	460	586	2960	0	0	1099
Confl. Peds. (#/hr)				9		
Confl. Bikes (#/hr)				1		
Turn Type	Prot	Prot	NA			NA
Protected Phases	8	8	2			6
Permitted Phases						
Actuated Green, G (s)	10.5	10.5	39.4			39.4
Effective Green, g (s)	13.5	13.5	42.4			42.4
Actuated g/C Ratio	0.23	0.23	0.71			0.71
Clearance Time (s)	4.5	4.5	5.0			5.0
Vehicle Extension (s)	2.0	2.0	3.5			3.5
Lane Grp Cap (vph)	806	654	3751			3751
v/s Ratio Prot	0.13	c0.20	c0.56			0.21
v/s Ratio Perm						
v/c Ratio	0.57	0.90	0.79			0.29
Uniform Delay, d1	20.4	22.3	5.6			3.1
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	0.6	14.6	1.2			0.1
Delay (s)	21.0	36.8	6.8			3.1
Level of Service	C	D	A			A
Approach Delay (s)	29.9		6.8			3.1
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	10.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	59.4	Sum of lost time (s)	3.5
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	780	392	0	2816	1034	0
Future Volume (vph)	780	392	0	2816	1034	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	1.5	1.5		2.0	2.1	
Lane Util. Factor	0.97	0.88		0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	1.00	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3547	2880		5255	5255	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3547	2880		5255	5255	
Peak-hour factor, PHF	0.92	0.92	0.97	0.97	0.97	0.97
Adj. Flow (vph)	848	426	0	2903	1066	0
RTOR Reduction (vph)	0	152	0	0	0	0
Lane Group Flow (vph)	848	274	0	2903	1066	0
Confl. Peds. (#/hr)			8			
Turn Type	Prot	Prot		NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases	4					
Actuated Green, G (s)	16.1	16.1		39.0	39.0	
Effective Green, g (s)	19.1	19.1		42.0	41.9	
Actuated g/C Ratio	0.30	0.30		0.65	0.65	
Clearance Time (s)	4.5	4.5		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		3.5	3.5	
Lane Grp Cap (vph)	1048	851		3416	3408	
v/s Ratio Prot	c0.24	0.10		c0.55	0.20	
v/s Ratio Perm						
v/c Ratio	0.81	0.32		0.85	0.31	
Uniform Delay, d1	21.1	17.7		8.8	5.0	
Progression Factor	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.4	0.1		2.2	0.1	
Delay (s)	25.5	17.8		11.0	5.1	
Level of Service	C	B		B	A	
Approach Delay (s)	22.9			11.0	5.1	
Approach LOS	C			B	A	

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	64.6	Sum of lost time (s)	3.6
Intersection Capacity Utilization	114.9%	ICU Level of Service	H
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 (vph)	136	1781	168	163	1008	69	141	35	123	25	24	63
Future Volume (vph)	136	1781	168	163	1008	69	141	35	123	25	24	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5	5.5	4.0	5.5		4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1829	5255	1636	3547	5204		1829	1925	1636	1829	1925	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1829	5255	1636	3547	5204		1829	1925	1636	1829	1925	1636
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	151	1979	187	181	1120	77	157	39	137	28	27	70
RTOR Reduction (vph)	0	0	58	0	4	0	0	0	108	0	0	60
Lane Group Flow (vph)	151	1979	129	181	1193	0	157	39	29	28	27	10
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	15.5	68.6	68.6	11.6	64.7		14.6	27.6	27.6	4.7	17.7	17.7
Effective Green, g (s)	15.5	68.6	68.6	11.6	64.7		14.6	27.6	27.6	4.7	17.7	17.7
Actuated g/C Ratio	0.12	0.53	0.53	0.09	0.50		0.11	0.21	0.21	0.04	0.14	0.14
Clearance Time (s)	4.0	5.5	5.5	4.0	5.5		4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	218	2773	863	316	2589		205	408	347	66	262	222
v/s Ratio Prot	c0.08	c0.38		0.05	0.23		c0.09	c0.02		0.02	0.01	
v/s Ratio Perm			0.08						0.02			0.01
v/c Ratio	0.69	0.71	0.15	0.57	0.46		0.77	0.10	0.08	0.42	0.10	0.04
Uniform Delay, d1	55.0	23.3	15.7	56.8	21.3		56.0	41.2	41.1	61.3	49.2	48.8
Progression Factor	1.00	1.00	1.00	1.20	0.65		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.1	1.6	0.4	2.4	0.6		15.6	0.1	0.1	4.3	0.2	0.1
Delay (s)	64.1	24.9	16.1	70.4	14.5		71.6	41.3	41.2	65.7	49.4	48.9
Level of Service	E	C	B	E	B		E	D	D	E	D	D
Approach Delay (s)		26.7			21.8			55.5			52.7	
Approach LOS		C			C			E			D	

Intersection Summary			
HCM 2000 Control Delay	28.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	64.8%	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 (vph)	35	1783	180	398	973	26	148	5	183	6	0	12
Future Volume (vph)	35	1783	180	398	973	26	148	5	183	6	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.5		4.0	5.5			4.0	4.0		4.0	
Lane Util. Factor	1.00	0.91		0.97	0.91			1.00	1.00		1.00	
Frt	1.00	0.99		1.00	1.00			1.00	0.85		0.91	
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.98	
Satd. Flow (prot)	1829	5183		3547	5234			1836	1636		1726	
Flt Permitted	0.95	1.00		0.95	1.00			0.72	1.00		0.92	
Satd. Flow (perm)	1829	5183		3547	5234			1384	1636		1611	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	39	1981	200	442	1081	29	164	6	203	7	0	13
RTOR Reduction (vph)	0	8	0	0	1	0	0	0	145	0	16	0
Lane Group Flow (vph)	39	2173	0	442	1109	0	0	170	58	0	4	0
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	7.1	66.2		22.6	81.7			27.7	27.7		27.7	
Effective Green, g (s)	7.1	66.2		22.6	81.7			27.7	27.7		27.7	
Actuated g/C Ratio	0.05	0.51		0.17	0.63			0.21	0.21		0.21	
Clearance Time (s)	4.0	5.5		4.0	5.5			4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	
Lane Grp Cap (vph)	99	2639		616	3289			294	348		343	
v/s Ratio Prot	0.02	c0.42		c0.12	0.21							
v/s Ratio Perm								c0.12	0.04		0.00	
v/c Ratio	0.39	0.82		0.72	0.34			0.58	0.17		0.01	
Uniform Delay, d1	59.4	27.0		50.7	11.4			45.9	41.7		40.4	
Progression Factor	1.29	0.35		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2	2.0	2.4		4.0	0.3			2.7	0.2		0.0	
Delay (s)	78.3	11.9		54.7	11.7			48.7	42.0		40.4	
Level of Service	E	B		D	B			D	D		D	
Approach Delay (s)		13.1			23.9			45.0			40.4	
Approach LOS		B			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
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 (vph)	314	1116	737	596	678	84	684	1016	811	93	634	139
Future Volume (vph)	314	1116	737	596	678	84	684	1016	811	93	634	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	6.0	5.0	5.0	6.0		5.0	6.0	5.0	5.0	6.0	6.0
Lane Util. Factor	0.97	0.91	0.88	0.94	0.91		0.94	0.91	0.88	0.97	0.86	0.88
Frt	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	2880	5157	5168		5157	5255	2880	3547	6621	2880
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	2880	5157	5168		5157	5255	2880	3547	6621	2880
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	324	1151	760	614	699	87	705	1047	836	96	654	143
RTOR Reduction (vph)	0	0	28	0	10	0	0	0	63	0	0	113
Lane Group Flow (vph)	324	1151	732	614	776	0	705	1047	773	96	654	30
Turn Type	Prot	NA	pm+ov	Prot	NA		Prot	NA	pm+ov	Prot	NA	Perm
Protected Phases	5	2	3	1	6		3	8	1	7	4	
Permitted Phases			2						8			4
Actuated Green, G (s)	18.1	36.0	60.1	21.9	39.8		24.1	36.3	58.2	15.4	27.6	27.6
Effective Green, g (s)	18.1	36.0	60.1	21.9	39.8		24.1	36.3	58.2	15.4	27.6	27.6
Actuated g/C Ratio	0.14	0.27	0.46	0.17	0.30		0.18	0.28	0.44	0.12	0.21	0.21
Clearance Time (s)	5.0	6.0	5.0	5.0	6.0		5.0	6.0	5.0	5.0	6.0	6.0
Vehicle Extension (s)	2.0	3.0	2.0	2.0	3.0		2.0	4.0	2.0	2.0	4.0	4.0
Lane Grp Cap (vph)	487	1437	1315	858	1562		944	1449	1273	415	1388	604
v/s Ratio Prot	0.09	c0.22	0.10	c0.12	c0.15		c0.14	c0.20	0.10	0.03	0.10	
v/s Ratio Perm			0.15						0.17			0.01
v/c Ratio	0.67	0.80	0.56	0.72	0.50		0.75	0.72	0.61	0.23	0.47	0.05
Uniform Delay, d1	53.9	44.5	26.0	51.9	37.7		50.9	43.1	28.0	52.7	45.6	41.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.7	3.3	0.3	2.4	0.3		2.9	1.9	0.6	0.1	0.3	0.0
Delay (s)	56.5	47.8	26.3	54.3	37.9		53.7	45.0	28.6	52.8	45.9	41.6
Level of Service	E	D	C	D	D		D	D	C	D	D	D
Approach Delay (s)		41.8			45.1			42.1			46.0	
Approach LOS		D			D			D			D	

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)	131.6	Sum of lost time (s)	22.0
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	801	361	2021	0	0	1627
Future Volume (vph)	801	361	2021	0	0	1627
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	2.5	2.5	2.0			2.0
Lane Util. Factor	0.97	0.88	0.91			0.91
Frt	1.00	0.85	1.00			1.00
Flt Protected	0.95	1.00	1.00			1.00
Satd. Flow (prot)	3547	2880	5255			5255
Flt Permitted	0.95	1.00	1.00			1.00
Satd. Flow (perm)	3547	2880	5255			5255
Peak-hour factor, PHF	0.84	0.84	0.91	0.91	0.94	0.94
Adj. Flow (vph)	954	430	2221	0	0	1731
RTOR Reduction (vph)	0	10	0	0	0	0
Lane Group Flow (vph)	954	420	2221	0	0	1731
Turn Type	Prot	Prot	NA			NA
Protected Phases	8	8	2			6
Permitted Phases	8					
Actuated Green, G (s)	15.6	15.6	31.8			31.8
Effective Green, g (s)	17.6	17.6	34.8			34.8
Actuated g/C Ratio	0.31	0.31	0.61			0.61
Clearance Time (s)	4.5	4.5	5.0			5.0
Vehicle Extension (s)	2.0	2.0	3.5			3.5
Lane Grp Cap (vph)	1097	890	3213			3213
v/s Ratio Prot	c0.27	0.15	c0.42			0.33
v/s Ratio Perm						
v/c Ratio	0.87	0.47	0.69			0.54
Uniform Delay, d1	18.6	15.9	7.4			6.4
Progression Factor	1.00	1.00	1.00			1.00
Incremental Delay, d2	7.3	0.1	0.7			0.2
Delay (s)	25.8	16.0	8.1			6.6
Level of Service	C	B	A			A
Approach Delay (s)	22.8		8.1			6.6
Approach LOS	C		A			A

Intersection Summary			
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	56.9	Sum of lost time (s)	4.5
Intersection Capacity Utilization	104.8%	ICU Level of Service	G
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 (vph)	526	237	320	181	0	517	0	2303	143	373	1254	0
Future Volume (vph)	526	237	320	181	0	517	0	2303	143	373	1254	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5		4.5		5.0	5.0	4.5	5.0	
Lane Util. Factor	0.97	1.00	1.00	0.97		0.88		0.91	1.00	0.97	0.95	
Frt	1.00	1.00	0.85	1.00		0.85		1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3547	1925	1636	3547		2880		5255	1636	3547	3657	
Flt Permitted	0.95	1.00	1.00	0.95		1.00		1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3547	1925	1636	3547		2880		5255	1636	3547	3657	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	572	258	348	197	0	562	0	2374	147	385	1293	0
RTOR Reduction (vph)	0	0	81	0	0	0	0	0	57	0	0	0
Lane Group Flow (vph)	572	258	267	197	0	562	0	2374	90	385	1293	0
Turn Type	Split	NA	Perm	Prot		pt+ov		NA	Perm	Prot	NA	
Protected Phases	4	4		8		1 8		2		1	6	
Permitted Phases			4	8					2			
Actuated Green, G (s)	23.0	23.0	23.0	8.0		22.0		45.2	45.2	9.5	59.2	
Effective Green, g (s)	23.0	23.0	23.0	8.0		22.0		45.2	45.2	9.5	59.2	
Actuated g/C Ratio	0.22	0.22	0.22	0.08		0.21		0.43	0.43	0.09	0.57	
Clearance Time (s)	4.5	4.5	4.5	4.5				5.0	5.0	4.5	5.0	
Vehicle Extension (s)	2.0	2.0	2.0	2.0				3.5	3.5	2.0	3.5	
Lane Grp Cap (vph)	782	424	361	272		608		2279	709	323	2077	
v/s Ratio Prot	0.16	0.13		0.06		c0.20		c0.45		c0.11	0.35	
v/s Ratio Perm			c0.16						0.06			
v/c Ratio	0.73	0.61	0.74	0.72		0.92		1.04	0.13	1.19	0.62	
Uniform Delay, d1	37.7	36.5	37.8	47.0		40.3		29.5	17.7	47.4	15.0	
Progression Factor	1.00	1.00	1.00	1.00		1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.1	1.7	6.7	7.8		19.6		30.8	0.1	112.9	0.6	
Delay (s)	40.8	38.2	44.5	54.9		59.9		60.3	17.8	160.2	15.6	
Level of Service	D	D	D	D		E		E	B	F	B	
Approach Delay (s)		41.3			58.6			57.8			48.8	
Approach LOS		D			E			E			D	

Intersection Summary			
HCM 2000 Control Delay	52.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	104.2	Sum of lost time (s)	18.5
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
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 (vph)	169	431	10	175	275	195	60	427	605	306	257	151
Future Volume (vph)	169	431	10	175	275	195	60	427	605	306	257	151
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.1	4.1		4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	
Lane Util. Factor	1.00	1.00		0.97	0.95	1.00	1.00	0.91	0.91	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	0.99	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.94	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1829	1918		3547	3657	1606	1829	3276	1470	1829	3438	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1829	1918		3547	3657	1606	1829	3276	1470	1829	3438	
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)	184	468	11	190	299	212	65	464	658	333	279	164
RTOR Reduction (vph)	0	1	0	0	0	167	0	78	158	0	67	0
Lane Group Flow (vph)	184	478	0	190	299	45	65	695	191	333	376	0
Confl. Peds. (#/hr)			2			5			1			1
Confl. Bikes (#/hr)			1									
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	13.7	32.4		6.9	25.6	25.6	7.0	40.6	40.6	23.7	57.3	
Effective Green, g (s)	13.7	32.4		6.9	25.6	25.6	7.0	40.6	40.6	23.7	57.3	
Actuated g/C Ratio	0.11	0.27		0.06	0.21	0.21	0.06	0.34	0.34	0.20	0.48	
Clearance Time (s)	4.1	4.1		4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	208	517		203	780	342	106	1108	497	361	1641	
v/s Ratio Prot	c0.10	c0.25		0.05	0.08		0.04	c0.21		c0.18	0.11	
v/s Ratio Perm						0.03			0.13			
v/c Ratio	0.88	0.93		0.94	0.38	0.13	0.61	0.63	0.38	0.92	0.23	
Uniform Delay, d1	52.4	42.6		56.3	40.4	38.2	55.2	33.3	30.2	47.2	18.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	32.8	22.5		45.0	0.3	0.2	10.1	2.7	2.2	28.5	0.3	
Delay (s)	85.2	65.1		101.3	40.8	38.4	65.3	36.0	32.4	75.7	18.7	
Level of Service	F	E		F	D	D	E	D	C	E	B	
Approach Delay (s)		70.7			56.4			36.6			43.2	
Approach LOS		E			E			D			D	

Intersection Summary			
HCM 2000 Control Delay	49.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	89.7%	ICU Level of Service	E
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		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	52	46	0	132	50	504	1	286	118	246	130	18
Future Volume (vph)	52	46	0	132	50	504	1	286	118	246	130	18
Peak Hour Factor	0.92	0.25	0.25	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	57	184	0	143	54	548	1	311	128	267	141	20

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total (vph)	241	197	548	157	284	428
Volume Left (vph)	57	143	0	1	0	267
Volume Right (vph)	0	0	548	0	128	20
Hadj (s)	0.08	0.18	-0.57	0.04	-0.28	0.13
Departure Headway (s)	7.2	7.5	3.2	7.1	6.8	6.7
Degree Utilization, x	0.48	0.41	0.49	0.31	0.53	0.79
Capacity (veh/h)	444	430	1116	468	494	516
Control Delay (s)	16.8	15.6	9.2	12.0	16.0	30.5
Approach Delay (s)	16.8	10.9		14.6		30.5
Approach LOS	C	B		B		D

Intersection Summary			
Delay	17.1		
Level of Service	C		
Intersection Capacity Utilization	60.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	916	808	62	203	353	1069	25	1235	289	604	304	203
Future Volume (vph)	916	808	62	203	353	1069	25	1235	289	604	304	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00	0.97	0.91	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3547	5255	1636	3547	5255	1636	3547	5255	1636	3547	5255	1636
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3547	5255	1636	3547	5255	1636	3547	5255	1636	3547	5255	1636
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	0.93
Adj. Flow (vph)	996	878	67	221	384	1162	27	1342	314	657	330	218
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	996	878	67	221	384	1162	27	1342	314	657	330	218
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases			Free			Free			Free			Free
Actuated Green, G (s)	27.1	33.1	111.3	11.3	17.3	111.3	3.8	29.8	111.3	17.1	43.1	111.3
Effective Green, g (s)	28.1	36.1	111.3	12.3	20.3	111.3	4.8	32.8	111.3	18.1	46.1	111.3
Actuated g/C Ratio	0.25	0.32	1.00	0.11	0.18	1.00	0.04	0.29	1.00	0.16	0.41	1.00
Clearance Time (s)	4.0	6.0		4.0	6.0		4.0	6.0		4.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	895	1704	1636	391	958	1636	152	1548	1636	576	2176	1636
v/s Ratio Prot	c0.28	0.17		0.06	0.07		0.01	c0.26		c0.19	0.06	
v/s Ratio Perm			0.04			c0.71			0.19			0.13
v/c Ratio	1.11	0.52	0.04	0.57	0.40	0.71	0.18	0.87	0.19	1.14	0.15	0.13
Uniform Delay, d1	41.6	30.5	0.0	47.0	40.1	0.0	51.3	37.2	0.0	46.6	20.4	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	66.0	0.3	0.0	1.9	0.3	2.6	0.6	5.4	0.3	82.7	0.0	0.2
Delay (s)	107.6	30.8	0.0	48.8	40.4	2.6	51.9	42.6	0.3	129.3	20.4	0.2
Level of Service	F	C	A	D	D	A	D	D	A	F	C	A
Approach Delay (s)		69.1			16.6			34.8			76.1	
Approach LOS		E			B			C			E	

Intersection Summary			
HCM 2000 Control Delay	47.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	111.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	87.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Appendix F – Queuing Analysis Worksheets

Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Group Flow (vph)	679	147	66	1028	229
v/c Ratio	0.20	0.13	0.52	0.26	0.34
Control Delay	11.8	7.7	57.1	9.3	35.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	7.7	57.1	9.3	35.8
Queue Length 50th (ft)	151	48	56	204	62
Queue Length 95th (ft)	194	122	m75	233	90
Internal Link Dist (ft)	677			236	522
Turn Bay Length (ft)		215	275		
Base Capacity (vph)	3419	1116	372	3887	1028
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.20	0.13	0.18	0.26	0.22

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Group Flow (vph)	1627	94	70	1438	352
v/c Ratio	0.48	0.09	0.52	0.37	0.54
Control Delay	7.0	2.5	51.7	11.6	41.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.0	2.5	51.7	11.6	41.8
Queue Length 50th (ft)	219	9	49	266	123
Queue Length 95th (ft)	9	0	m75	382	141
Internal Link Dist (ft)	677			236	522
Turn Bay Length (ft)		215	275		
Base Capacity (vph)	3370	1081	167	3872	1080
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.48	0.09	0.42	0.37	0.33

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	241	577	6	32	677	31	19	34	30	10	523
v/c Ratio	0.80	0.19	0.01	0.18	0.31	0.04	0.14	0.07	0.06	0.14	0.87
Control Delay	58.7	21.2	0.6	61.1	28.9	0.1	62.1	27.6	0.2	63.8	41.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.7	21.2	0.6	61.1	28.9	0.1	62.1	27.6	0.2	63.8	41.7
Queue Length 50th (ft)	197	141	0	13	132	0	8	20	0	8	269
Queue Length 95th (ft)	271	186	1	30	221	0	16	30	0	27	348
Internal Link Dist (ft)		770			1452			564			729
Turn Bay Length (ft)	240		375	350		220	250		160	170	
Base Capacity (vph)	313	2976	970	204	2216	742	204	698	686	105	777
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.19	0.01	0.16	0.31	0.04	0.09	0.05	0.04	0.10	0.67

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	277	1341	59	24	1053	23	82	104	78	34	460
v/c Ratio	0.75	0.41	0.06	0.13	0.45	0.03	0.42	0.34	0.20	0.36	0.79
Control Delay	44.4	14.1	4.7	55.0	26.3	0.0	61.2	42.3	1.2	64.9	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.4	14.1	4.7	55.0	26.3	0.0	61.2	42.3	1.2	64.9	16.9
Queue Length 50th (ft)	201	270	7	9	197	0	31	77	0	26	46
Queue Length 95th (ft)	#407	442	43	23	326	0	55	92	0	60	119
Internal Link Dist (ft)		770			1452			564			729
Turn Bay Length (ft)	240		375	350		220	250		160	170	
Base Capacity (vph)	369	3296	1066	221	2352	787	221	649	656	114	852
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.41	0.06	0.11	0.45	0.03	0.37	0.16	0.12	0.30	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	7	61	121	101	31	257	905	133	13	803
v/c Ratio	0.06	0.15	0.15	0.46	0.05	0.69	0.30	0.12	0.06	0.26
Control Delay	58.8	9.7	4.8	65.9	16.4	66.3	19.4	3.5	58.2	24.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.8	9.7	4.8	65.9	16.4	66.3	19.4	3.5	58.2	24.3
Queue Length 50th (ft)	6	5	0	43	9	108	153	0	5	135
Queue Length 95th (ft)	21	35	19	73	30	#157	264	38	15	176
Internal Link Dist (ft)		402			508		336			508
Turn Bay Length (ft)	170			180		340		340	120	
Base Capacity (vph)	112	653	1285	221	744	382	2986	1128	218	3085
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.09	0.09	0.46	0.04	0.67	0.30	0.12	0.06	0.26

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	38	161	313	272	84	429	1281	468	76	1067
v/c Ratio	0.34	0.31	0.30	1.25	0.15	0.80	0.49	0.41	0.35	0.42
Control Delay	67.1	9.1	3.3	192.3	21.2	66.4	28.1	3.1	63.0	31.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	67.1	9.1	3.3	192.3	21.2	66.4	28.1	3.2	63.0	31.7
Queue Length 50th (ft)	31	21	0	~146	32	~227	342	0	32	216
Queue Length 95th (ft)	63	58	19	#239	66	#333	398	62	54	232
Internal Link Dist (ft)		402			508		336			508
Turn Bay Length (ft)	170			180		340		340	120	
Base Capacity (vph)	112	706	1401	218	761	533	2593	1153	220	2551
Starvation Cap Reductn	0	0	0	0	0	0	164	127	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.23	0.22	1.25	0.11	0.80	0.53	0.46	0.35	0.42

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Group Flow (vph)	679	190	71	1028	244
v/c Ratio	0.20	0.17	0.54	0.26	0.36
Control Delay	12.0	8.2	57.2	9.1	35.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.0	8.2	57.2	9.1	35.5
Queue Length 50th (ft)	152	62	60	204	65
Queue Length 95th (ft)	197	155	m81	234	94
Internal Link Dist (ft)	677			236	522
Turn Bay Length (ft)		215	275		
Base Capacity (vph)	3401	1126	372	3883	1031
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.20	0.17	0.19	0.26	0.24

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Group Flow (vph)	1627	112	77	1438	401
v/c Ratio	0.49	0.10	0.55	0.38	0.59
Control Delay	7.6	2.7	52.3	12.0	42.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.6	2.7	52.3	12.0	42.5
Queue Length 50th (ft)	232	15	56	274	141
Queue Length 95th (ft)	9	0	80	382	160
Internal Link Dist (ft)	677			236	522
Turn Bay Length (ft)		215	275		
Base Capacity (vph)	3317	1071	169	3833	1080
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.49	0.10	0.46	0.38	0.37

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	241	585	6	75	682	31	19	37	32	10	527
v/c Ratio	0.80	0.21	0.01	0.39	0.31	0.04	0.14	0.08	0.06	0.14	0.87
Control Delay	59.8	21.7	0.6	65.4	29.4	0.1	62.1	26.6	0.2	63.8	42.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.8	21.7	0.6	65.4	29.4	0.1	62.1	26.6	0.2	63.8	42.3
Queue Length 50th (ft)	197	144	0	31	135	0	8	22	0	8	279
Queue Length 95th (ft)	272	188	1	58	222	0	16	32	0	27	358
Internal Link Dist (ft)		770			1452			564			729
Turn Bay Length (ft)	240		375	350		220	250		160	170	
Base Capacity (vph)	311	2843	931	204	2185	733	204	698	688	105	772
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.21	0.01	0.37	0.31	0.04	0.09	0.05	0.05	0.10	0.68

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	277	1357	59	35	1061	23	82	110	94	34	461
v/c Ratio	0.75	0.41	0.06	0.19	0.45	0.03	0.42	0.36	0.24	0.36	0.79
Control Delay	44.1	13.9	4.5	56.0	26.5	0.0	61.2	41.9	1.8	64.9	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.1	13.9	4.5	56.0	26.5	0.0	61.2	41.9	1.8	64.9	16.9
Queue Length 50th (ft)	201	273	7	13	200	0	31	81	0	26	46
Queue Length 95th (ft)	#409	446	42	30	329	0	55	95	0	60	120
Internal Link Dist (ft)		770			1452			564			729
Turn Bay Length (ft)	240		375	350		220	250		160	170	
Base Capacity (vph)	369	3292	1065	221	2348	786	221	648	656	114	852
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.41	0.06	0.16	0.45	0.03	0.37	0.17	0.14	0.30	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	7	70	137	101	31	413	905	133	13	834
v/c Ratio	0.06	0.17	0.17	0.46	0.05	0.66	0.30	0.12	0.06	0.32
Control Delay	58.8	9.0	4.6	65.9	16.4	56.0	19.4	3.5	58.2	29.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.8	9.0	4.6	65.9	16.4	56.0	19.4	3.5	58.2	29.1
Queue Length 50th (ft)	6	5	0	43	9	167	153	0	5	156
Queue Length 95th (ft)	21	36	20	73	30	#318	264	38	15	181
Internal Link Dist (ft)		402			508		336			508
Turn Bay Length (ft)	170			180		340		340	120	
Base Capacity (vph)	112	656	1295	221	744	628	2986	1128	218	2604
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.11	0.11	0.46	0.04	0.66	0.30	0.12	0.06	0.32

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	50	197	386	272	84	458	1281	468	76	1078
v/c Ratio	0.45	0.37	0.37	1.25	0.15	0.80	0.49	0.41	0.35	0.44
Control Delay	71.9	8.2	5.9	192.3	21.2	64.2	28.1	3.1	63.0	32.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	71.9	8.2	5.9	192.3	21.2	64.2	28.1	3.2	63.0	32.6
Queue Length 50th (ft)	41	21	17	~146	32	~253	342	0	32	218
Queue Length 95th (ft)	77	60	37	#239	66	#362	398	62	54	234
Internal Link Dist (ft)		402			508		336			508
Turn Bay Length (ft)	170			180		340		340	120	
Base Capacity (vph)	112	722	1407	218	761	575	2593	1153	220	2471
Starvation Cap Reductn	0	0	0	0	0	0	164	127	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.27	0.27	1.25	0.11	0.80	0.53	0.46	0.35	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT
Lane Group Flow (vph)	873	189	78	1215	157	107
v/c Ratio	0.26	0.17	0.57	0.31	0.53	0.29
Control Delay	3.9	0.7	78.8	5.0	63.6	23.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.9	0.7	78.8	5.0	63.6	23.4
Queue Length 50th (ft)	21	0	65	198	67	35
Queue Length 95th (ft)	27	0	123	50	101	84
Internal Link Dist (ft)	677			471		522
Turn Bay Length (ft)		215	275			
Base Capacity (vph)	3393	1123	246	3890	788	557
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.17	0.32	0.31	0.20	0.19

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	11	1895	226	160	2588	11	790	77	43	11	120
v/c Ratio	0.13	0.82	0.28	0.84	0.87	0.01	1.00	0.13	0.42	0.06	0.41
Control Delay	83.7	19.1	3.2	84.3	20.6	0.0	83.0	0.5	71.7	51.6	6.8
Queue Delay	0.0	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.7	19.1	3.2	84.3	22.1	0.0	83.0	0.5	71.7	51.6	6.9
Queue Length 50th (ft)	9	553	19	142	308	0	~346	0	36	8	0
Queue Length 95th (ft)	m17	233	3	m169	#932	m0	#483	0	76	28	25
Internal Link Dist (ft)		677			468			522		426	
Turn Bay Length (ft)	150		215	275		275			100		100
Base Capacity (vph)	97	2325	809	204	2966	973	788	614	111	236	343
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	211	0	0	0	0	0	6
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.82	0.28	0.78	0.94	0.01	1.00	0.13	0.39	0.05	0.36

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	286	576	116	247	731	31	140	30	200	16	139	430
v/c Ratio	0.71	0.21	0.13	0.63	0.27	0.04	0.56	0.07	0.38	0.20	0.46	0.74
Control Delay	56.3	27.5	17.2	62.8	21.5	0.1	66.7	36.2	6.5	65.3	52.2	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.3	27.5	17.2	62.8	21.5	0.1	66.7	36.2	6.5	65.3	52.2	14.2
Queue Length 50th (ft)	110	138	31	104	117	0	59	20	0	13	112	31
Queue Length 95th (ft)	176	226	109	150	229	0	93	38	51	37	134	100
Internal Link Dist (ft)		535			1452			564			729	
Turn Bay Length (ft)	240		375	350		220	250		160	170		
Base Capacity (vph)	506	2681	891	395	2673	877	313	710	730	105	651	811
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.21	0.13	0.63	0.27	0.04	0.45	0.04	0.27	0.15	0.21	0.53

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	345	1354	382	134	1826	34	445	166	392	47	157	480
v/c Ratio	0.64	0.54	0.33	0.58	0.88	0.05	0.88	0.33	0.63	0.47	0.51	0.72
Control Delay	68.8	38.7	3.9	69.6	43.1	0.1	73.3	39.1	27.6	75.0	53.4	31.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.8	38.7	3.9	69.6	43.1	0.1	73.3	39.1	27.6	75.0	53.4	31.1
Queue Length 50th (ft)	159	315	84	57	499	0	190	120	182	39	127	263
Queue Length 95th (ft)	m#261	373	m127	92	#780	0	#269	140	174	80	154	322
Internal Link Dist (ft)		535			1452			564			729	
Turn Bay Length (ft)	240		375	350		220	250		160	170		
Base Capacity (vph)	538	2524	1182	231	2069	723	532	799	619	119	636	667
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.54	0.32	0.58	0.88	0.05	0.84	0.21	0.63	0.39	0.25	0.72

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	7	145	288	90	31	588	1049	107	13	906
v/c Ratio	0.07	0.33	0.32	0.44	0.06	0.78	0.34	0.09	0.06	0.31
Control Delay	62.8	7.7	4.1	69.5	18.6	64.7	18.9	3.5	66.9	23.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.8	7.7	4.1	69.5	18.6	64.7	18.9	3.5	66.9	23.0
Queue Length 50th (ft)	6	6	0	40	10	180	183	0	6	100
Queue Length 95th (ft)	23	53	30	70	32	225	310	33	m14	131
Internal Link Dist (ft)		402			508		436			508
Turn Bay Length (ft)	170			180		340		340	120	
Base Capacity (vph)	106	663	1324	206	703	795	3110	1146	206	2945
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.22	0.22	0.44	0.04	0.74	0.34	0.09	0.06	0.31

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	78	318	629	229	84	1112	2023	379	70	1057
v/c Ratio	0.70	0.55	0.57	1.05	0.16	0.98	0.80	0.35	0.32	0.53
Control Delay	90.3	15.5	16.6	132.5	20.7	71.2	35.6	3.5	62.6	36.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	90.3	15.5	16.6	132.5	20.7	71.2	35.6	3.5	62.6	36.0
Queue Length 50th (ft)	66	73	84	~108	32	~531	~719	6	29	201
Queue Length 95th (ft)	#145	161	137	#193	66	#624	#814	64	55	237
Internal Link Dist (ft)		402			508		425			508
Turn Bay Length (ft)	170			180		340		340	120	
Base Capacity (vph)	112	734	1423	218	759	1135	2535	1097	218	1991
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.43	0.44	1.05	0.11	0.98	0.80	0.35	0.32	0.53

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	EBR	WBL	WBT	NBL	NBT
Lane Group Flow (vph)	873	232	83	1215	163	114
v/c Ratio	0.27	0.21	0.58	0.31	0.54	0.31
Control Delay	4.1	1.0	78.0	5.0	63.6	22.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.1	1.0	78.0	5.0	63.6	22.6
Queue Length 50th (ft)	20	0	70	199	69	36
Queue Length 95th (ft)	26	0	130	50	104	86
Internal Link Dist (ft)	677			471		522
Turn Bay Length (ft)		215	275			
Base Capacity (vph)	3292	1111	246	3885	788	560
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.21	0.34	0.31	0.21	0.20

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	11	1895	244	168	2588	11	822	93	43	11	120
v/c Ratio	0.13	0.82	0.30	0.86	0.87	0.01	1.04	0.16	0.42	0.06	0.41
Control Delay	82.3	19.5	3.5	86.0	20.6	0.0	92.6	0.6	71.7	51.6	6.8
Queue Delay	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.3	19.5	3.5	86.0	22.3	0.0	92.6	0.6	71.7	51.6	6.9
Queue Length 50th (ft)	9	553	23	150	307	0	~386	0	36	8	0
Queue Length 95th (ft)	m17	220	3	m176	#932	m0	#513	0	76	28	25
Internal Link Dist (ft)		677			468			522		426	
Turn Bay Length (ft)	150		215	275		275			100		100
Base Capacity (vph)	97	2311	807	205	2966	973	788	614	111	236	343
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	219	0	0	0	0	0	6
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.82	0.30	0.82	0.94	0.01	1.04	0.15	0.39	0.05	0.36

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	286	584	116	290	735	31	140	32	202	16	142	430
v/c Ratio	0.71	0.22	0.13	0.73	0.28	0.04	0.56	0.07	0.38	0.20	0.47	0.73
Control Delay	56.1	27.2	16.9	67.7	21.6	0.1	66.7	36.3	6.5	65.3	52.3	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.1	27.2	16.9	67.7	21.6	0.1	66.7	36.3	6.5	65.3	52.3	14.1
Queue Length 50th (ft)	109	138	30	123	118	0	59	21	0	13	114	31
Queue Length 95th (ft)	175	228	109	173	231	0	93	41	51	37	137	100
Internal Link Dist (ft)		535			1452			564			729	
Turn Bay Length (ft)	240		375	350		220	250		160	170		
Base Capacity (vph)	506	2675	889	395	2667	875	313	710	731	105	651	811
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.22	0.13	0.73	0.28	0.04	0.45	0.05	0.28	0.15	0.22	0.53

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	345	1369	382	144	1833	34	445	168	408	47	158	480
v/c Ratio	0.64	0.54	0.33	0.62	0.89	0.05	0.88	0.33	0.66	0.47	0.51	0.72
Control Delay	68.5	39.1	3.9	71.6	43.4	0.1	73.3	39.2	28.9	75.0	53.4	31.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.5	39.1	3.9	71.6	43.4	0.1	73.3	39.2	28.9	75.0	53.4	31.0
Queue Length 50th (ft)	159	319	82	61	502	0	190	122	195	39	128	262
Queue Length 95th (ft)	m#260	376	m121	98	#786	0	#269	141	185	80	154	322
Internal Link Dist (ft)		535			1452			564			729	
Turn Bay Length (ft)	240		375	350		220	250		160	170		
Base Capacity (vph)	538	2522	1181	231	2067	722	532	799	620	119	636	668
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.54	0.32	0.62	0.89	0.05	0.84	0.21	0.66	0.39	0.25	0.72

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	7	152	305	90	31	734	1049	107	13	936
v/c Ratio	0.07	0.34	0.34	0.44	0.06	0.82	0.34	0.09	0.06	0.34
Control Delay	62.8	7.7	4.1	69.5	18.6	63.1	18.9	3.5	66.6	24.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.8	7.7	4.1	69.5	18.6	63.1	18.9	3.5	66.6	24.2
Queue Length 50th (ft)	6	6	0	40	10	222	183	0	6	104
Queue Length 95th (ft)	23	54	31	70	32	#311	310	33	m13	134
Internal Link Dist (ft)		402			508		436			508
Turn Bay Length (ft)	170			180		340		340	120	
Base Capacity (vph)	106	667	1335	206	703	893	3110	1146	206	2759
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.23	0.23	0.44	0.04	0.82	0.34	0.09	0.06	0.34

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
12: Hacienda Dr. & Martinelli Way/Hacienda Crossings

Near-Term with Project Conditions
Timing Plan: P.M. Peak

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	89	348	696	229	84	1139	2023	379	70	1067
v/c Ratio	0.79	0.59	0.62	1.05	0.15	1.05	0.81	0.35	0.32	0.54
Control Delay	102.9	18.4	19.3	132.5	20.4	88.4	36.5	3.5	62.6	36.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	102.9	18.4	19.3	132.5	20.4	88.4	36.5	3.5	62.6	36.1
Queue Length 50th (ft)	75	96	110	~108	32	~548	~719	6	29	203
Queue Length 95th (ft)	#171	192	168	#193	66	#640	#814	64	55	240
Internal Link Dist (ft)		402			508		425			508
Turn Bay Length (ft)	170			180		340		340	120	
Base Capacity (vph)	112	732	1423	218	759	1086	2486	1085	218	1991
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.48	0.49	1.05	0.11	1.05	0.81	0.35	0.32	0.54

Intersection Summary
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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Vision That Moves Your Community

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