Draft

TheLAB

Transportation Impact Analysis

Prepared for:
City of Berkeley

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FEHR PEERS

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0. Executive Summary

This report presents the transportation impact analysis conducted for the proposed TheLAB development in West Berkeley. The proposed project includes the renovation and repurposing of existing buildings between Bancroft Way, Fifth Street, Allston Way, and the railroad, the development of a new parking garage, and the development of new life sciences space at 787 Bancroft Way.

0.1 Summary of Findings

- **VMT:** The project would have a less-than-significant impact on vehicle miles traveled (VMT).
- **TDM Plan**: The project would implement a transportation demand management (TDM) plan that would reduce the VMT, vehicular trips, and parking generated by the project by up to 15 percent.
- **Traffic Operations:** Traffic generated by the project would trigger the City of Berkeley's thresholds for traffic operations at the following locations:

    - *Bancroft Way/Sixth Street intersection*: The project would cause a substantial effect at this unsignalized intersection because in the PM peak hour under Near-Term Plus Project conditions, the eastbound approach (critical approach) would operate at LOS F, the intersection would meet the California MUTCD peak hour signal warrant, and the project would add more than ten peak hour trips to the critical approach. The installation of a signal would improve the intersection to LOS B or better during both the AM and PM peak hours. The 600 Addison Street project has been conditioned to install a traffic signal at this intersection.

    The implementation of the identified improvement measures would mitigate the substantial effects at this intersection, and the proposed project would not trigger the City's current thresholds for traffic operations at the other studied intersections.

- **Access and Circulation:** The project would accommodate access and circulation for passenger automobiles, trucks, bicycles, pedestrians, and emergency vehicles in and around the site. The proposed project would:

    - The 600 Addison Street project is conditioned to improve the existing at-grade railroad crossing on Bancroft Way. However, if this at-grade crossing has not been improved prior to the occupancy of 787 Bancroft Way, the proposed project shall coordinate with Union Pacific Railroad (UPRR), California Public Utilities Commission (CPUC), and the City of Berkeley to improve the at-grade railroad crossing, consistent with the Federal Railroad Administration requirements.

0.2 CEQA Vehicle Miles Traveled (VMT) Assessment

The project would satisfy the Transit Priority Area screening criterion from the City of Berkeley's adopted VMT Criteria and Thresholds and is therefore presumed to have a less-than-significant impact on VMT.

0.3 Transportation Demand Management

Although the proposed project would not result in a significant VMT impact, it would implement a Transportation Demand Management (TDM) Plan to reduce VMT, automobile trip generation, and parking demand. The TDM Plan, which would be implemented at the time of the occupancy, would include the following strategies:

a. Provide shuttle service between the project and a BART station during weekday peak commute periods (6:00 AM to 10:00 AM and 3:00 PM to 7:00 PM). The project would also explore the feasibility, and if feasible, will coordinate the shuttle service with existing shuttle services, and/or other employers in West Berkeley. Shuttle service would be adjusted based on ridership.
b. Provide bike lockers, showers, personal lockers, and a repair station on-site to encourage bicycling to the site.
c. Coordinate with the City of Berkeley and/or regional agencies to facilitate the potential installation of a BayWheels bikeshare station along the project frontage.
d. Offer to provide free parking spaces for at least two car share vehicles (ZIP Car, etc.).
e. Offer carpool/ride-matching services, such as ZimRide, ComoVee, or 511.org RideShare, to pair employees interested in forming commute carpools.
f. Provide at least 10 spaces of preferential carpool parking, including free parking for carpoolers if employees are charged for on-site parking. Carpool parking spaces not occupied by 10:00 AM would be available to other vehicles.
g. Require tenants to provide full or partial transit subsidy to project employees. Tenants may offer one of the following to employees that request it:[1]
    - A monthly commuter check (or alternatively Clipper Card, which is accepted by BART, AC Transit, and other major transit providers in the Bay Area)
    - Subsidized AC Transit bus pass
    - Subsidized Capital Corridor monthly ticket
h. Require tenants to provide pre-tax commuter benefits for project employees.
i. Regularly provide project tenants and employees information about various transportation options in the area and the TDM strategies provided by the project. The main lobby of each major project building shall also provide all the information on transportation options, such as a TransitScreen.
j. Provide information on the Bay Area Commuter Benefits Program to all building tenants. As of September 30, 2014, Bay Area employers with 50 or more full-time employees within the Bay Area Air Quality Management District (Air District) geographic boundaries are required to register and offer commuter benefits to their employees in order to comply with Air District Regulation 14, Rule 1, also known as the Bay Area Commuter Benefits Program. Employers must select one of four Commuter Benefit options to offer their employees: a pre-tax benefit, an

[1] This analysis assumes that a transit fare subsidy of about $2.50 per employee per weekday (value to rider, not cost to employer) will be available to all site employees.

employer-provided subsidy, employer-provided transit, or an alternative commute benefit. (Information about Commute Benefits Program is at 511.org/employers/commuter/overview.)

It is estimated that the TDM Plan would reduce the project-generated VMT by between eight and fifteen percent.

0.4 Traffic Operations Analysis

Although level of service (LOS) or other measures of automobile delay can no longer be used to identify significant impacts under CEQA, this report evaluates the potential effects of the traffic generated by the proposed project on local traffic operations and circulation. This report evaluates these effects during the AM and PM peak hours at six key intersections, as determined by this report and confirmed by the City of Berkeley staff, under Near-Term conditions.

The proposed project is estimated to generate about 180 AM and 181 PM net new peak-hour automobile trips. Based on the application of the City's current thresholds for traffic operations, the following substantial effects and improvement measures are identified:

- *Bancroft Way/Sixth Street intersection*: The project would cause a substantial effect at this unsignalized intersection because in the PM peak hour under Near-Term Plus Project conditions, the eastbound approach (critical approach) would operate at LOS F, the intersection would meet the California MUTCD peak hour signal warrant, and the project would add more than ten peak hour trips to the critical approach. The installation of a signal would improve the intersection to LOS B or better during both the AM and PM peak hours. The 600 Addison Street project has been conditioned to install a traffic signal at this intersection.

The implementation of the identified improvement measure would mitigate the substantial effects at this intersection, and the proposed project would not trigger the City's thresholds for traffic operations at the other five studied intersections.

0.5 Site Access, Circulation, and Parking

0.5.1 Site Access and Circulation

The project would accommodate access and circulation for passenger automobiles, trucks, bicycles, pedestrians, and emergency vehicles in and around the site.

0.5.2 Parking

The project would meet the City of Berkeley's requirements for minimum automobile parking, including requirements for accessible parking spaces and electric vehicle charging spaces. The project would also meet the City of Berkeley's requirements for minimum bicycle parking, as well as the amount of long-term and short-term bicycle parking recommended by the *City of Berkeley Bicycle Plan*.

0.5.3 Modifications in the Public Right-of-Way

The following improvements in the public right-of-way, which shall be completed prior to occupancy, are proposed as part of the project to improve access and circulation in the project vicinity:

1. Installation of curb extensions on Fourth Street, extending for approximately 170 feet on the east side and 185 feet on the west side.
2. Installation of an uncontrolled midblock marked crosswalk on Fourth Street, approximately 225 feet north of Bancroft Way, to connect the parking garage and buildings on the east side of the street and the main lobby entrance for 787 Bancroft Way. The crosswalk would include pedestrian safety measures, including high-visibility crosswalk markings, nighttime pedestrian-scale lighting, and advanced "Yield Here to Pedestrians" signs and yield lines.
3. Installation of marked crosswalks on all four approaches of the Bancroft Way/Fourth Street and Allston Way/Fourth Street intersections and the provision of curb ramps with truncated domes at all four corners of the Allston Way/Fourth Street intersection.
4. Elimination of existing curb cuts at the following locations:
    - Two curb cuts on the north side of Bancroft Way along the 787 Bancroft Way frontage
    - Seven curb cuts on the west side of Fourth Street along the 787 Bancroft Way frontage
    - Two curb cuts on the east side of Fourth Street along the parking garage frontage and proposed curb extensions
    - Three curb cuts on the west side of Fifth Street along the frontage of the renovated buildings and proposed parking garage
5. Installation of new curb cuts at the following locations to provide access to the parking garages and surface parking lot:
    - Two curb cuts on Bancroft Way along the 787 Bancroft Way frontage
    - Two curb cuts on Fourth Street and one curb cut on Fifth Street
6. Modified curb use designations at the following locations:
    - On the north side of Bancroft Way, the project proposes about 85 feet of new red curb and 42 feet of yellow curb for commercial loading between the parking lot and loading driveways on Bancroft Way.
    - On the south side of Bancroft Way, the project proposes about 15 feet of new red curb opposite the surface parking lot driveway.
    - On the west side of Fourth Street, the project proposes about 70 feet of white curb for passenger loading and unloading adjacent to the 787 Bancroft Way building lobby.
    - On the east side of Fourth Street, the project proposes about 70 feet of new red curb and to remove about 20 feet of yellow curb.
    - On the west side of Fifth Street, the project proposes about 40 feet of new red curb and to remove about 90 feet of yellow curb.

7. The 600 Addison Street project is conditioned to improve the existing at-grade railroad crossing on Bancroft Way. However, if this at-grade crossing has not been improved prior to the occupancy of 787 Bancroft Way, the proposed project shall coordinate with UPRR, CPUC, and the City of Berkeley to improve the safety of all travelers at the at-grade railroad crossing. Potential improvements, which will be consistent with the Federal Railroad Administration requirements, may include:
    - Improving the automatic gate and warning devices at the crossing
    - Improving the sidewalk on the north side of Bancroft Way, including across the railroad tracks, to meet ADA requirements.

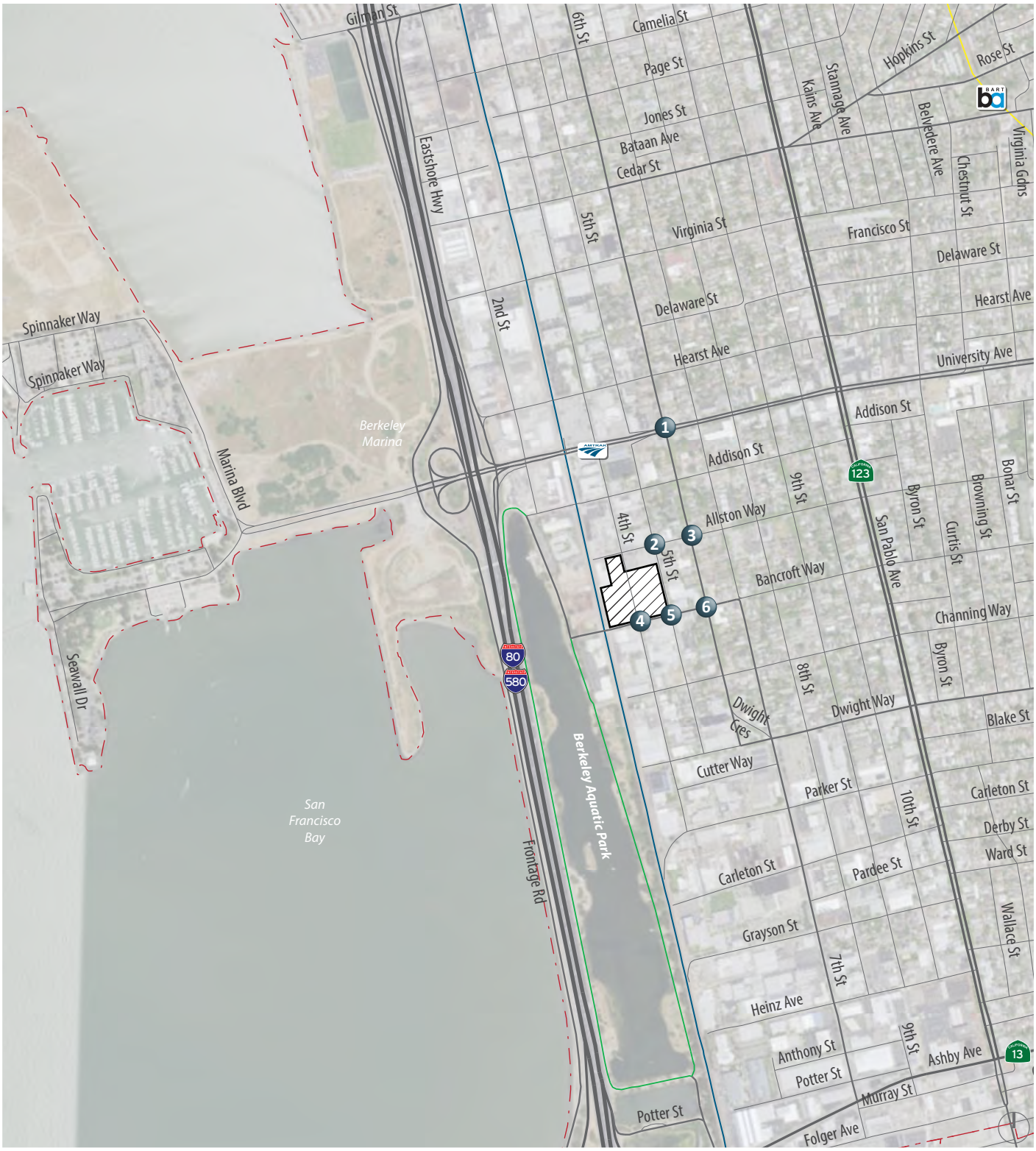
1. Introduction

This report analyzes the effects of the proposed TheLAB development in West Berkeley. The project includes the renovation of about 106,200 square feet of existing commercial uses, development of a 415-space parking garage, and development of about 159,100 square feet of new life sciences office/R&D and light manufacturing uses. The proposed project is located between Bancroft Way, Fifth Street, Allston Way, and the railroad in West Berkeley. **Figure 1** shows the location of the project site and study intersections.

1.1 Report Organization

This report is divided into the following six chapters:

- ***Chapter 1 – Introduction*** describes the analysis methods used for the traffic operations analysis of the proposed project. This chapter also includes the criteria used to determine the substantial effects caused by the project.
- ***Chapter 2 – Existing Conditions*** describes the existing conditions in the vicinity of the project site, including the existing roadway network, traffic operations, transit, and bicycle and pedestrian circulation.
- ***Chapter 3 – Project Transportation Characteristics*** describes the project, the estimated number of trips generated by the project, and the projected trip distribution and assignment of project trips.
- ***Chapter 4 – VMT Assessment*** describes the VMT assessment completed for the project.
- ***Chapter 5 – Traffic Operation Analysis*** describes traffic operations under Near-Term and Near-Term Plus Project conditions and identifies potential substantial effects of the project.
- ***Chapter 6 – Access, Circulation, and Parking*** evaluates the multimodal access, circulation, safety, and parking for the proposed project.



Project Site # Study Intersection

Figure 1

Project Site and Study Intersections

1.2 Intersection Operations Analysis Methodology

1.2.1 Study Intersections

This study analyzes existing traffic operations during typical weekday AM and PM peak hours at the following six intersections in the vicinity of the project:

1. University Avenue/Sixth Street
2. Allston Way/Fifth Street
3. Allston Way/Sixth Street
4. Bancroft Way/Fourth Street
5. Bancroft Way/Fifth Street
6. Bancroft Way/Sixth Street

These intersections were selected for analysis and confirmed by City staff because they are either adjacent to the site, or they are most likely to be affected by the proposed project. Figure 1 shows the location of the study intersections.

1.2.2 Intersection Analysis Scenarios

For this study, the following scenarios were evaluated:

- ***Existing*** – Existing (pre-pandemic, 2019) conditions based on data collected in the past five years.
- ***Near-Term*** – Existing traffic, plus traffic generated by major approved and proposed development projects in the study area that are expected to be constructed and occupied in the near future.
- ***Near-Term Plus Project*** – Near-Term conditions, plus traffic expected to be generated by the project.

1.2.3 Level of Service

Intersection operations are described using the term "Level of Service" (LOS). LOS is a qualitative description of traffic operations from the vehicle driver perspective and consists of the delay experienced by the driver at the intersection. It ranges from LOS A, with no congestion and little delay, to LOS F, with excessive congestion and delays. Different methods are used to assess signalized and unsignalized intersections.

Signalized Intersections

Signalized intersection operations are evaluated using the method provided in the 2010 Highway Capacity Manual (HCM). This method uses intersection characteristics to estimate average control delay and then assigns a LOS value. Control delay is defined as the delay associated with deceleration, stopping, moving up in the queue, and acceleration experienced by drivers at a signalized intersection. **Table 1** provides descriptions of various LOS and the corresponding ranges of delays for signalized intersections.

Table 1: Intersection Level of Service Definitions

Unsignalized Intersections		Level of Service Grade	Signalized Intersections	
Description	Average Total Vehicle Delay (Seconds)		Average Control Vehicle Delay (Seconds)	Description
No delay for stop-controlled approaches.	≤10.0	A	≤10.0	Free Flow or Insignificant Delays: Operations with very low delay, when signal progression is extremely favorable, and most vehicles arrive during the green light phase. Most vehicles do not stop at all.
Operations with minor delay.	>10.0 and ≤15.0	B	>10.0 and ≤20.0	Stable Operation or Minimal Delays: Generally occurs with good signal progression and/or short cycle lengths. More vehicles stop than with LOS A, causing higher levels of average delay. An occasional approach phase is fully utilized.
Operations with moderate delays.	>15.0 and ≤25.0	C	>20.0 and ≤35.0	Stable Operation or Acceptable Delays: Higher delays resulting from fair signal progression and/or longer cycle lengths. Drivers begin having to wait through more than one red light. Most drivers feel somewhat restricted.
Operations with increasingly unacceptable delays.	>25.0 and ≤35.0	D	>35.0 and ≤55.0	Approaching Unstable or Tolerable Delays: Influence of congestion becomes more noticeable. Longer delays result from unfavorable signal progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop. Drivers may have to wait through more than one red light. Queues may develop, but dissipate rapidly, without excessive delays.
Operations with high delays, and long queues.	>35.0 and ≤50.0	E	>55.0 and ≤80.0	Unstable Operation or Significant Delays: Considered to be the limit of acceptable delay. High delays indicate poor signal progression, long cycle lengths and high volume to capacity ratios. Individual cycle failures are frequent occurrences. Vehicles may wait through several signal cycles. Long queues form upstream from intersection.
Operations with extreme congestion, and with very high delays and long queues unacceptable to most drivers.	>50.0	F	>80.0	Forced Flow or Excessive Delays: Occurs with oversaturation when flows exceed the intersection capacity. Represents jammed conditions. Many cycle failures. Queues may block upstream intersections.

Source: *Highway Capacity Manual*, Transportation Research Board, 2010.

Unsignalized Intersections

All-way stop-controlled and side-street stop-controlled intersection operations are also analyzed using the 2010 HCM. Delay is calculated for movements that are controlled by a stop sign or that must yield the right-of-way. This method defines operations by average control delay per vehicle (measured in seconds) for each stop-controlled movement. This incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. For side-street stop-controlled intersections, the movement or approach with the highest delay is reported, as well as average intersection delay. Table 1 summarizes the LOS ranges for unsignalized intersections. They are lower than the delay ranges for signalized intersections because drivers generally tolerate less delay at unsignalized intersections.

1.2.4 Analysis Tools

The Synchro 11 Software is used to estimate delay and LOS for all signalized, all-way stop-controlled, and side-street stop-controlled study intersections. Synchro uses the equations provided in the 2010 HCM to calculate control delay. These equations use intersection characteristics, such as vehicle and pedestrian volumes, lane geometry, and signal phasing, as inputs to estimate control delay.

1.2.5 Thresholds for Traffic Operations

For the purposes of this analysis, the following intersection LOS thresholds are used based on the City of Berkeley's *Guidelines for Development of Traffic Impact Reports (2005)*. A substantial effect is identified if the addition of project-generated traffic under Near-Term conditions results in[2]:

- At a signalized, roundabout, or all-way stop-controlled intersection operations degrade from LOS D to LOS E or worse and more than a two-second increase in delay; or
- At a signalized, roundabout, or all-way stop-controlled intersection, more than a three-second increase in delay at intersections operating at LOS E without and with the project; or
- At a signalized, roundabout, or all-way stop-controlled intersection, operations degrade from LOS E to LOS F and more than a three-second increase in delay; or
- At a signalized, roundabout, or all-way stop-controlled intersection operating at LOS F without the project, a change in the volume-to-capacity (v/c) ratio of more than 0.01.
- At an unsignalized intersection:
    - a movement that operates at LOS F;
    - the intersection meets peak hour traffic volume signal warrants;
    - minimum of 10 peak-hour vehicles added to the critical movement; and
    - no alternative routes are available.

[2] Since Project effects on traffic operations is not considered an environmental topic under CEQA, this report uses the terms "effect," "substantial," and "improvement," instead of "impact," "significant," and "mitigation" when discussing traffic operations and LOS results to differentiate between the CEQA and the non-CEQA analyses.

2. Existing Conditions

This chapter describes the existing transportation conditions for the project.

2.1 Existing Roadway Network

The regional and local roadways serving the project site are described below.

2.1.1 Regional Roadways

Interstate 80/580 (I-80/I-580) provides access around and beyond the San Francisco Bay Area. Between Emeryville and Albany, I-80 shares the same roadway as I-580, with I-580 connecting with Marin County to the west and I-80 connecting with Sacramento to the east. Near the project site, I-80 and I-580 are oriented in a north-south direction and provide five lanes of travel in each direction. Access between I-80/I-580 and the project site is provided primarily through the interchange at University Avenue. I-80/I-580 operates at capacity during the peak commute hours. I-80/I-580 had an Average Annual Daily Traffic (AADT) of 233,500 vehicles at the University Avenue interchange in 2019.

San Pablo Avenue (SR 123) is a divided, four-lane, north-south major street that extends between Rodeo in the north and Downtown Oakland in the south. The divided roadway provides a center median and left-turn pockets at major intersections in Berkeley. San Pablo Avenue provides sidewalks and metered parallel parking on both sides of the street near the project site. San Pablo Avenue had an AADT of 19,550 at University Avenue in 2019.

2.1.2 Local Roadways

Fourth Street is a two-lane, north-south collector that provides metered parking north of Addison Street and unrestricted parking south of Addison Street. Sidewalks are provided on both side of the street in the project vicinity. Fourth Street between Hearst Avenue and Channing Way is a designated bicycle route.

Fifth Street is a two-lane, north-south local street that generally provides unrestricted parking in the project vicinity, except for metered parking around University Avenue. Sidewalks are provided on both sides of the street in the project vicinity.

Sixth Street is a two-lane, north-south collector that generally provides unrestricted on-street parking in the project vicinity, except for metered parking around University Avenue. Sidewalks are provided on both sides of the street in the project vicinity.

Allston Way is a two-lane, east-west roadway that provides unrestricted on-street parking and sidewalks along both sides of the street. Allston Way between Fourth Street and McGee Avenue is a designated bicycle route.

Bancroft Way is a two-lane, east-west roadway that provides unrestricted on-street parking and sidewalks along both sides of the street. Bancroft Way between Bolivar Drive and Ninth Street is a designated bicycle route.

University Avenue is a four-lane, east-west major street between downtown Berkeley in the east and I-80/580 and the Berkeley Marina in the west. University Avenue is a divided roadway with raised medians and left-turn pockets at major intersections. University Avenue provides metered parallel parking and sidewalks on both sides of the street near the project site. University Avenue is an elevated structure between Sixth Street and just west of the I-80/580 interchange, with one-way frontage roads on both sides of the roadway between the railroad tracks and Fifth Street.

2.2 Existing Intersection Operations

2.2.1 Existing Volumes

Traffic patterns and travel behavior have shifted substantially in Berkeley and throughout Bay Area because of the ongoing COVID-19 pandemic and associated shelter-in-place orders. As a result, traditional traffic counts collected under current conditions would not reflect typical traffic volumes prior to the start of the pandemic. Thus, this analysis uses several available sources to estimate the weekday AM and PM peak period (7:00 to 9:00 AM and 4:00 to 6:00 PM) intersection turning movement, pedestrian, and bicycle volumes at the study intersections under existing conditions. These time periods were selected because the trips generated by the proposed project during the peak periods, in combination with background traffic, are expected to represent typical worst traffic conditions.

The University Avenue/Sixth Street, Bancroft Way/Fourth Street, Bancroft Way/Sixth Street intersections are based on data collected in November 2019 for the *Berkeley Commons Transportation Impact Analysis (January 2021)*. The Allston Way/Sixth Street intersection is based on data collected in September 2016 for the *2100 San Pablo Avenue Transportation Impact Analysis (October 2017)*.

Since count data from the past five years was not available for the Allston Way/Fifth Street and Bancroft Way/Fifth Street intersections, data purchased from StreetLight Data (a big data vendor of anonymous location records from GPS devices) is used.[3] The Streetlight Data volume estimates were downloaded for midweek days (Tuesdays, Wednesdays, and Thursdays) for April and May of 2019 and aggregated to averages for these two study intersections. **Appendix A** presents the detailed StreetLight volume data.

[3] In early 2020, Fehr & Peers conducted an independent review of StreetLight Data volume estimates by comparing the volume estimates to historical count data. The review concluded that StreetLight volume estimates are a reasonable and acceptable source of data as a replacement for traditional traffic counts. Streetlight Data volume estimates are generally more robust than traditional traffic counts since they assess travel patterns across several months, rather than a single day. For more information about the Streetlight data collection approach, including the Fehr & Peers white paper "A Transformative Data Collection Solution," visit: https://www.fehrandpeers.com/transformative-data-collection-solution/

Figure 2 shows the existing AM and PM peak hour intersection vehicle volumes and the lane configurations and controls at the study intersections. **Figure 3** shows the existing AM and PM peak hour bicycle and pedestrian volumes.

2.2.2 Intersection Operations

Based on the volumes, intersection controls, and roadway configurations presented on Figure 2, Fehr & Peers calculated the AM and PM peak hour LOS at the study intersections using the methodologies presented in Chapter 1. **Table 2** summarizes existing weekday AM and PM peak hour intersection LOS analysis results. **Appendix B** provides the detailed LOS calculation worksheets. As shown in Table 2, all study intersections operate at LOS D or better during AM and PM peak hours under existing conditions.

Table 2: Existing Conditions – Study Intersection LOS Summary

Intersection	Control	AM Peak Hour		PM Peak Hour	
		Delay (Seconds)[1]	LOS [2]	Delay (Seconds) [1]	LOS[2]
1. University Avenue/Sixth Street	Signalized	45	D	43	D
2. Allston Way/Fifth Street	Side-Street Stop	9 (15)	A (C)	7 (15)	A (C)
3. Allston Way/Sixth Street	Signalized	21	C	20	C
4. Bancroft Way/Fourth Street	All-Way Stop	8	A	9	A
5. Bancroft Way/Fifth Street	Side-Street Stop	8 (18)	A (C)	6 (17)	A (C)
6. Bancroft Way/Sixth Street	Side-Street Stop	1 (17)	A (C)	3 (23)	A (C)

Notes:
1. Average intersection delay and LOS based on the 2010 HCM method. Average delay is reported for signalized and all-way stop-controlled intersections. Average intersection and worst-movement delays, respectively, are reported for side-street stop-controlled intersections.
2. Based on 2010 HCM delay thresholds.

Source: Fehr & Peers, 2021.

2.2.3 Peak Hour Signal Warrant Assessment

To assess the need for signalization of stop-controlled intersections, the California Manual on Uniform Traffic Control Devices (MUTCD) includes eight signal warrants. Generally, meeting one or more of the signal warrants could justify signalization of an intersection. This analysis evaluates the California MUTCD peak hour vehicular volume warrant (Warrant 3B) for urban conditions to determine if the traffic added by the project would result in the stop-controlled intersections needing to be signalized.

The peak hour traffic signal warrant was evaluated for the four unsignalized study intersections based on the volumes, intersection controls, and roadway configurations presented on Figure 2. As shown in **Table 3**, none of the unsignalized study intersections meet the California MUTCD peak hour signal warrant under existing conditions during the AM or PM peak hours. **Appendix C** provides the signal warrant worksheets.

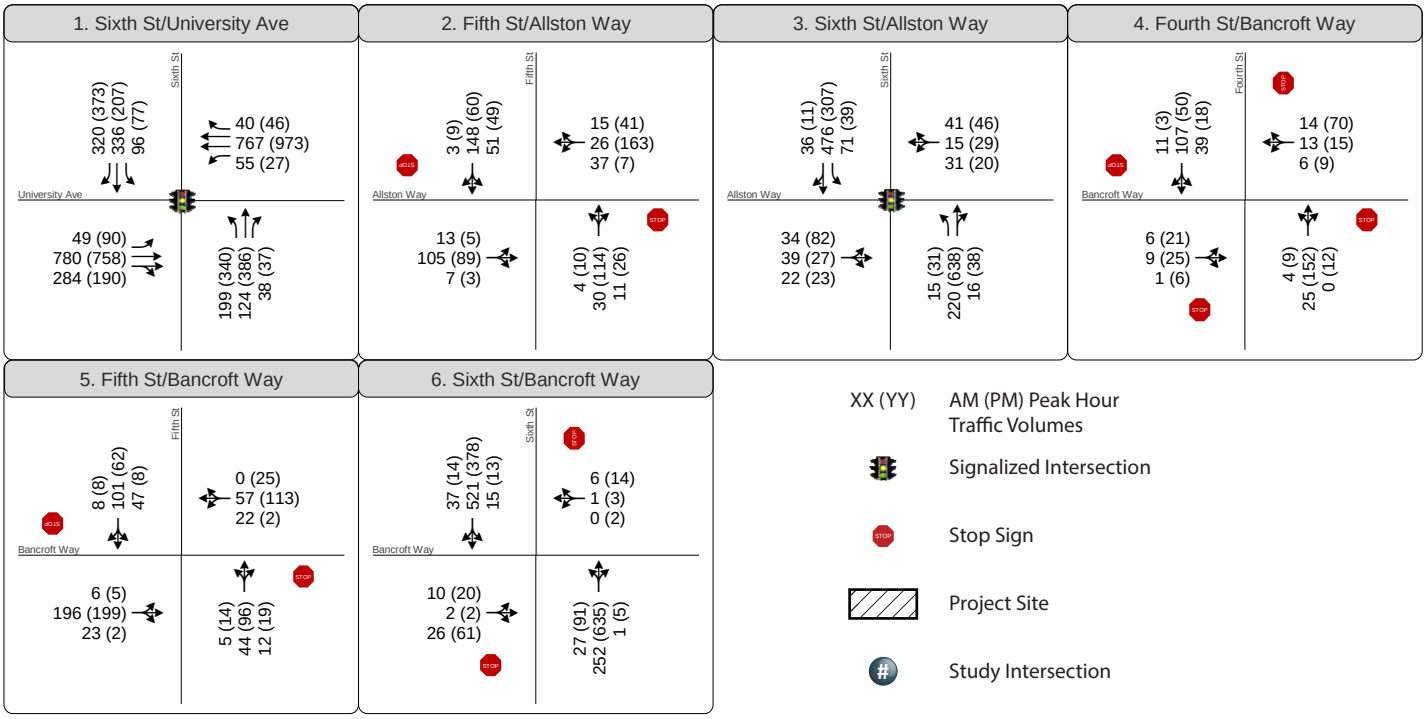


Figure 2

Existing Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls

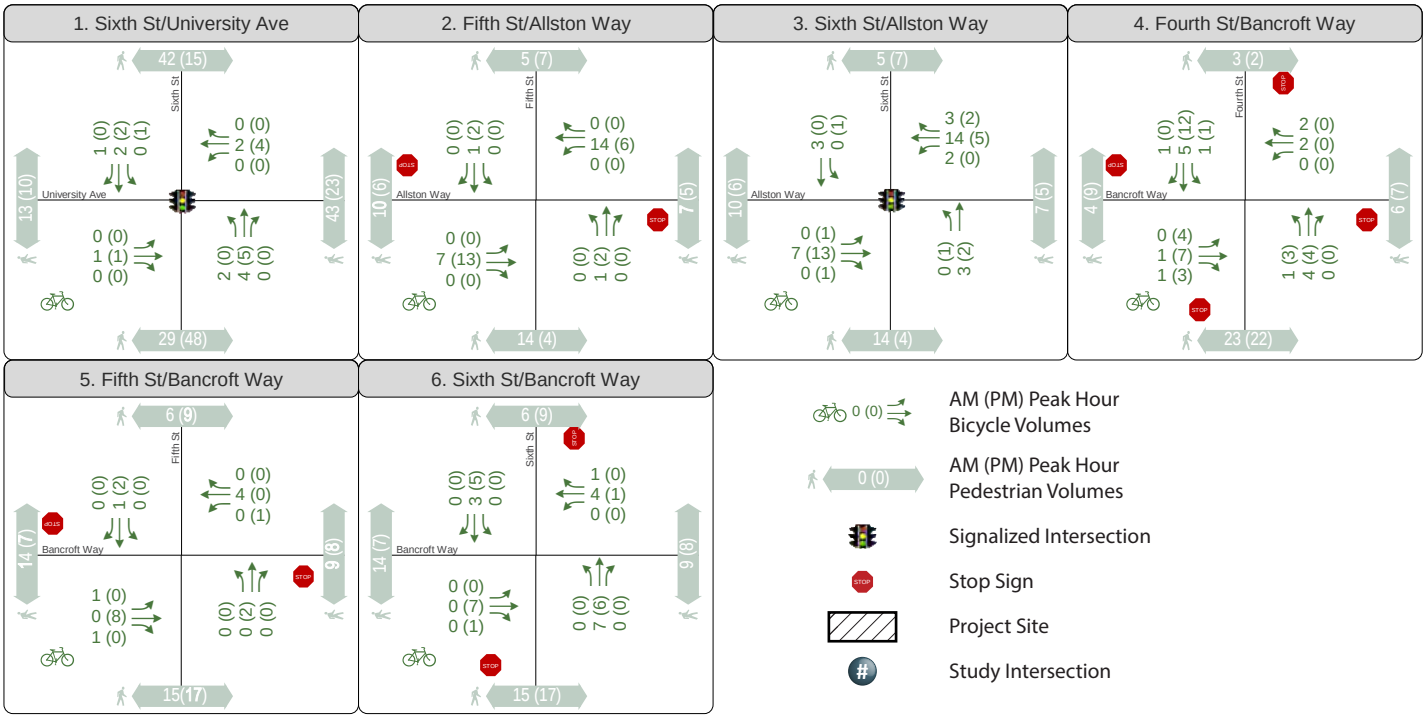


Figure 3

Existing Peak Hour Bicycle and Pedestrian Volumes

Table 3: Existing Conditions – Study Intersection Peak Hour Signal Warrant Summary

Intersection	Control	Meet AM Peak Hour Signal Warrant?[1]	Meet PM Peak Hour Signal Warrant?[1]
2. Allston Way/Fifth Street	Side-Street Stop	No	No
4. Bancroft Way/Fourth Street	All-Way Stop	No	No
5. Bancroft Way/Fifth Street	Side-Street Stop	No	No
6. Bancroft Way/Sixth Street	Side-Street Stop	No	No

Notes:
1. Based on the application of California MUTCD Warrant 3B.

Source: Fehr & Peers, 2021.

2.3 Existing Transit Service

The project area is served by BART, AC Transit, Amtrak California, the West Berkeley Shuttle, and a private ferry service. **Figure 4** shows the transit routes in the vicinity of the project site.

2.3.1 BART

BART provides regional commuter rail transit in Alameda, Contra Costa, San Francisco, San Mateo, and Santa Clara counties. As of September 2021, BART trains operate on weekdays from 5:00 AM to 12:00 AM, on Saturdays from 6:00 AM to 12:00 AM, and on Sundays from 8:00 AM to 9:00 PM. The nearest BART stations to the project site are the North Berkeley BART station, located about 1.3 miles northeast of the project site and the Downtown Berkeley BART station located about 1.8 miles east of the project site.

The North Berkeley and Downtown Berkeley BART stations are served by the Richmond-Berryessa/North San José (orange) and Richmond-Millbrae/SFO (red) lines. Other destinations in the BART system can be reached by transferring at stations in Oakland. As of September 2021, the North Berkeley and Downtown Berkeley BART stations are served by a train every eight minutes during peak weekday commute periods, every 15 minutes on Saturdays, and every 30 minutes on Sundays and holidays. In October 2019, the North Berkeley BART station had approximately 8,500 entries and exits on an average weekday, and the Downtown Berkeley BART station had approximately 23,100.[4]

[4] Bay Area Rapid Transit 2019 Monthly Ridership Reports: http://www.bart.gov/about/reports/ridership

Figure 4

Existing Transit Service

2.3.2 AC Transit

Local bus service in the project area is provided by AC Transit, the public transportation authority for western Alameda and Contra Costa counties. As shown on Figure 4, the project area is served by several AC Transit bus lines, connecting the project site to other neighborhoods within Berkeley and the adjacent cities of Albany, Emeryville, Oakland, and San Francisco. **Table 4** describes the AC Transit bus lines serving the project area as of fall 2019. AC Transit has temporarily suspended service on Lines 80, FS, and Z in response to the COVID-19 pandemic. **Table 5** describes AC Transit bus stops near the project site.

2.3.3 Amtrak

Amtrak provides regional rail transit for intercity commuters in northern and southern California, with select service to Nevada. Amtrak's Capitol Corridor route operates between San Jose and Sacramento.

The Berkeley Amtrak station is located under the University Avenue overpass, about 0.4 miles northwest of the project site. There are 11 daily weekday departures and arrivals and nine daily weekend departures and arrivals per direction at the Berkeley Station.[5] In FY2019, the station served about 175,000 rail passengers.[6] The Amtrak station is served by AC Transit Line 51B, with additional bus service nearby. The station provides basic amenities, including outside seating and automobile and bicycle parking.

Amtrak operates on the Union Pacific Railroad (UPRR) mainline tracks through West Berkeley. Directly west of the project site, the tracks have an at-grade crossing at Bancroft Way. This crossing provides automated gate arms on the vehicular approach directions and flashing warning devices. The pedestrian crossings do not meet ADA standards.

2.3.4 West Berkeley Shuttle

The West Berkeley Shuttle is a free shuttle funded by the Berkeley Gateway Transportation Management Association that provides transit connection between the Ashby BART station and major employment centers in West Berkeley. The shuttle operates two buses on weekdays from 5:30 AM to 10:00 AM and from 3:00 PM to 7:00 PM with approximately 15-minute headways. The morning and afternoon routes vary slightly, but the nearest stop to the project for both routes is on Dwight Way at Sixth Street, about 0.3 miles southeast of the project site. As of September 2021, the shuttle remains in operation.

[5] Amtrak Capitol Corridor Schedule: https://www.capitolcorridor.org/trainschedule/Train_Schedules.pdf
[6] Amtrak Fact Sheet, Fiscal Year 2019: https://www.amtrak.com/content/dam/projects/dotcom/english/public/documents/corporate/statefactsheets/CALIFORNIA19.pdf

Table 4: AC Transit Service Summary

Line	Route [1]	Nearest Stop [2]	Weekday [1]		Weekend [1]		Average Daily Route Ridership (Weekday)[3]
			Hours	Frequency	Hours	Frequency	
Local Routes							
36	Bancroft Way & Piedmont Ave., Berkeley to West Oakland BART via Bancroft Way/Durant Ave., Shattuck Ave., Dwight Way, 7th St., Public Market Emeryville, Shellmound St., 40th St., and Adeline St.	Dwight Way/ Seventh St. (about 0.4 miles away)	5:45 AM to 12:45 AM	30 minutes	5:45 AM to 12:45 AM	30 minutes	1,430
51B	Rockridge BART to Berkeley Amtrak or Berkeley Marina via College Ave., Bancroft Way, Durant Ave., Shattuck Ave., Downtown Berkeley, and University Ave.	University Ave./ Berkeley Amtrak (about 0.4 miles away)	5:30 AM to 12:15 AM	10 to 20 minutes	5:00 AM to 12:30 AM	15 to 20 minutes	9,130
72	Hilltop Mall to Jack London Square via Moyers Rd., Contra Costa College, San Pablo Ave., El Cerrito del Norte BART, and downtown Oakland.	San Pablo Ave./ Bancroft Way (about 0.4 miles away)	4:45 AM to 1:15 AM	30 minutes	5:00 AM to 2:00 AM	30 minutes	3,930
72M	Point Richmond to Jack London Square via Garrard Blvd., Macdonald Ave., El Cerrito del Norte BART, San Pablo Ave., and downtown Oakland	San Pablo Ave./ Bancroft Way (about 0.4 miles away)	4:45 AM to 12:30 AM	30 minutes	6:00 AM to 2:00 AM	30 to 40 minutes	3,880
80	El Cerrito Plaza BART to Ashby Ave. & Claremont Ave. via Central Ave, Pierce St., Pacific East Mall, University Village, 6th St., 7th St., and Ashby Ave.	University Ave./ Sixth St. (about 0.4 miles away)	6:00 AM to 10:30 PM	20 minutes	6:00 AM to 10:30 PM	20 minutes	910
Night Routes							
802	Berkeley Amtrak to downtown Oakland via San Pablo Ave.	University Ave./ Berkeley Amtrak (about 0.4 miles away)	12:15 AM to 5:30 AM	60 minutes	12:15 AM to 5:30 AM	60 minutes	90

Table 4: AC Transit Service Summary

Line	Route [1]	Nearest Stop [2]	Weekday [1]		Weekend [1]		Average Daily Route Ridership (Weekday)[3]
			Hours	Frequency	Hours	Frequency	
Transbay Routes							
FS	Solano Ave. & Colusa St. to Salesforce Transit Center, San Francisco via Shattuck Ave., and University Ave.	University Ave./ Sixth St. (about 0.4 miles away)	6:15 AM to 9:30 AM (westbound) 4:30 PM to 8:00 PM (eastbound)	15 to 50 minutes	No Weekend Service		700
G	El Cerrito Plaza BART to Salesforce Transit Center, San Francisco via Fairmount Ave., Colusa Ave., Solano Ave., San Pablo Ave., and University Ave.	University Ave./ Sixth St. (about 0.4 miles away)	5:30 AM to 9:45 AM (westbound) 4:15 PM to 8:00 PM (eastbound)	15 to 40 minutes	No Weekend Service		450
Z	Salesforce Transit Center, San Francisco to San Pablo Ave. & Marin Ave., Albany via Christie St., Hollis St., and Sixth St.	University Ave./ Sixth St. (about 0.4 miles away)	7:30 AM to 9:00 AM (eastbound) 4:45 PM to 6:30 PM (westbound)	60 minutes	No Weekend Service		50

Notes:
1. Service description as of fall 2019
2. Distance shown is walking distance between bus stop and project site.
3. AC Transit Ridership Data, spring 2019

Source: Fehr & Peers and AC Transit, 2021.

Table 5: AC Transit Bus Stops Summary

Stop Location	Distance to Project Site[1]	Lines Served	Stop Amenities	Average Daily Passengers (Weekday)[2]
University Avenue at Berkeley Amtrak Station	0.4 miles north of the project	51B, 802	Benches, bicycle parking, automobile parking (shared with Berkeley Amtrak Station)	216
Sixth Street at Allston Way	0.2 miles northeast of the project	80, Z	Northbound: no amenities Southbound: bench	35
University Avenue at Sixth Street	0.3 miles northeast of the project	51B, 802, G	Eastbound: bench, bicycle parking Westbound: bench	913
Sixth Street at University Avenue	0.4 miles northeast of the project	80, Z	No amenities	51
Dwight Way at Seventh Street	0.4 miles southeast of the project	36	Eastbound: shelter	21
San Pablo Avenue at Bancroft Way	0.4 miles east of the project	72, 72M, 802	Northbound: bench Southbound: no amenities	52
San Pablo Avenue at University Avenue	0.7 miles northeast of the project	72R	Northbound: bench, shelter Southbound: bench, shelter	873
University Avenue at San Pablo Avenue	0.7 miles northeast of the project	800	Eastbound: bench Westbound: bench, shelter	19

Notes:
1. Distance shown is walking distance between bus stop and project site.
2. AC Transit Ridership Data, spring 2019
Source: Fehr & Peers and AC Transit, 2021.

2.3.5 Ferry Service

Tideline is a private commuter ferry service that provides service between the Berkeley Marina, San Francisco Pier 1.5, and San Francisco Pier 52. Prior to the COVID-19 pandemic, Tideline operated two ADA compliant vessels, with daily service from 7:30 AM to 10:15 AM and 3:55 PM to 6:35 PM. Each vessel has a maximum capacity of 40 passengers, and tickets must be reserved online. As of September 2021, daily service has been suspended indefinitely due to the COVID-19 pandemic.

2.4 Existing Pedestrian and Bicycle Circulation

2.4.1 Pedestrian Circulation

Near the project site, most non-residential and all residential streets provide sidewalks. Fourth Street currently provides 12-foot sidewalk on the west side of the street along the frontage of 787 Bancroft Way and 716 Allston Way and on the east side of the street along the frontage of the proposed parking garage and the renovated existing buildings. Bancroft Way, Fifth Street, and Allston Way currently provide 12-foot sidewalks along the project frontages.

Signalized intersections in the vicinity of the project provide curb ramps and pedestrian signal heads. Marked crosswalks are provided at most unsignalized intersections near the project site.

2.4.2 Bicycle Circulation

Based on the *City of Berkeley Bicycle Plan* (2017), bicycle facilities can be classified into the following:

- ***Bicycle Paths (Class I)*** – These facilities are located off-street and may serve both bicyclists and pedestrians. They provide complete right-of-way to cycling, walking, and other non-motorized forms of transportation.
- ***Bicycle Lanes (Class II)*** – These facilities provide a dedicated area for bicyclists within the paved street width through striping and signage.
- ***Bicycle Routes (Class III)*** – These facilities are found along streets that do not provide adequate width for dedicated bicycle lanes. The street is then designated as a bicycle route through signage informing drivers to expect bicyclists. Bicycle routes are generally along collector and arterial streets when bicycle lanes are infeasible.
- ***Separated Bikeways (Class IV)*** – These are separated and protected bikeways where a type of barrier, usually curbs, bollards, or parking isles, separate the bike lane from the vehicular flow of traffic. These are also known as cycle tracks.
- ***Bicycle Boulevards*** – These facilities are mostly installed along residential streets with low traffic volumes and prioritize bicycle travel. Assignment of right-of-way to the route, traffic calming measures and bicycle traffic signal actuation are used to prioritize through-trips for bicycles.

Figure 5 identifies existing and proposed bicycle facilities in the study area.

A mix of bicycle paths, bicycle boulevards, and bicycle lanes provide direct access to the nearby commercial and business areas, as well as the Berkeley Amtrak station. Bancroft Way and Fourth Street adjacent to the project provide Class III bicycle routes. These facilities connect with Class II bicycle lanes on Sixth Street and bicycle boulevards on Ninth Street and Channing Way. The Class I Aquatic Park Path is located about one block west of the project, and access to the Bay Trail is provided through the Eastshore Pedestrian Overcrossing about 0.3 miles northwest of the project.

The *City of Berkeley Bicycle Plan* (2017) identifies Addison Street as a proposed bicycle boulevard and University Avenue and San Pablo Avenue as proposed Class IV cycletracks. Recommended improvements on Addison Street include traffic circles at Fifth and Seventh Streets, Rectangular Rapid Flash Beacons and a median at Sixth Street, and a traffic diverter at Tenth Street.

The nearest Bay Wheels bikeshare station is located on Addison Street just east of Fourth Street, about 0.1 miles north of the project.

Project Site

Existing	*Proposed*	
		Bike Path (Class I)
		Bike Lane (Class II)
		Bike Route (Class III)
		Bicycle Boulevard
		Cycletrack (Class IV)

Figure 5

Existing and Planned Bicycle Network

3. Project Transportation Characteristics

This section describes the proposed project, its transportation characteristics, and summarizes the effects of the proposed project on traffic operations under Existing Plus Project conditions.

3.1 Project Description

The proposed project is located in West Berkeley and includes the renovation of about 106,200 square feet of existing commercial uses, development of a 415-space parking garage, and development of about 159,100 square feet of new life sciences office/R&D and light manufacturing uses. **Table 6** summarizes the uses and sizes of the existing and proposed buildings by the three phases described below. **Figure 6** shows the project site plan.

The project would consist of three phases:

- **Phase 1 –** The project would renovate existing buildings that were vacant as of August 2020 and previously used for warehousing or light manufacturing. These buildings form a contiguous area fronting Fifth Street to the east, Bancroft Way to the south, and Fourth Street to the west. The renovations would result in about 12,100 square feet of additional building area. An existing surface parking lot with a driveway on Fifth Street would be retained, with the number of parking spaces reduced from 31 to 13 spaces.
- **Phase 2 –** The project would develop a 415-space parking garage directly to the north of the buildings renovated as part of Phase 1, replacing several small existing buildings. The garage would serve the Phases 1 and 3 project uses and would be accessed through two-way driveways on Fourth and Fifth Streets. The garage would also provide a loading dock in the southwest corner of the project with access on Fourth Street.
- **Phase 3 –** The project would demolish existing light manufacturing and warehouse space to develop about 125,800 square feet of office/R&D space and about 33,300 square feet of light manufacturing space at 787 Bancroft Way, bounded by Fourth Street to the east, Bancroft Way to the south, railroad tracks to the west, and existing buildings to the north. The site would also provide a 97-space surface parking lot, accessed through a two-way driveway on Bancroft Way.
- **Renovation of 716 Allston Way (Separate AUP Application) –** The project would renovate existing warehouse space at 716 Allston way into office/R&D and light manufacturing space, which would result in about 5,100 square feet of additional building area.

At buildout, the renovated and new buildings combined would provide about 133,700 square feet of office/ R&D space and about 131,700 square feet of light manufacturing space.

Table 6: Project Land Use Summary

Address	Existing		Proposed	
	Land Use[1]	Size[2]	Land Use	Size[2]
Phase 1				
2246 Fifth Street – Tenant B	Light Manufacturing **(vacant)**	12.5 KSF	Light Manufacturing	12.5 KSF
2246 Fifth Street – Tenant A	Light Manufacturing **(vacant)**	17.2 KSF	Light Manufacturing	17.4 KSF
2229 Fourth Street	Light Manufacturing **(vacant)**	14.2 KSF	Light Manufacturing	19.9 KSF
2222 Fifth Street	Light Manufacturing **(vacant)**	11.7 KSF	Light Manufacturing	17.9 KSF
2233 Fourth Street	Warehouse **(vacant)**	7.1 KSF	Light Manufacturing	7.1 KSF
Phase 2				
2221 Fourth Street	Light Manufacturing **(vacant)**	4.1 KSF	Parking Garage	-
2216 Fifth Street	Light Manufacturing	4.0 KSF	Parking Garage	-
2213 Fourth Street	Storage **(vacant)**	0.7 KSF	Parking Garage	-
2212 Fifth Street	Residential **(vacant)**	2 DU	Parking Garage	-
Phase 3				
701 Bancroft Way	Light Manufacturing	2.4 KSF	Parking Lot	-
705 Bancroft Way	Warehouse	4.1 KSF	Parking Lot	-
703 Bancroft Way	Warehouse	13.3 KSF	Parking Lot	-
705A Bancroft Way	Warehouse	1.5 KSF	Parking Lot	-
747 Bancroft Way	Warehouse	43.7 KSF	Parking Lot	-
2220 Fourth Street	Warehouse	15.1 KSF	Parking Lot	-
787 Bancroft Way	-	-	Office/R&D Light Manufacturing	125.8 KSF 33.3 KSF
Renovation of 716 Allston Way (Separate AUP Application)				
716 Allston Way	Warehouse	26.4 KSF	Office/R&D Light Manufacturing	7.9 KSF 23.6 KSF

Notes:
1. Vacancies indicated as of the submission of permit applications to the City of Berkeley in August 2020.
2. KSF = 1,000 square feet, DU = dwelling units

Source: SteelWave, 2021.

Site Plan Source: Skidmore, Owings & Merrill LLP, 08/13/21

Figure 6

Conceptual Project Site Plan

3.2 Automobile Trip Generation

Trip generation is the process of estimating the number of vehicles that would likely access the project on any given day. For the proposed and existing light manufacturing and warehouse uses, Fehr & Peers estimated trip generation using data published by the Institute of Transportation Engineers (ITE) in the *Trip Generation Manual (10th Edition)*, which includes land use codes that match the uses proposed by the project and existing uses at the site.

However, the ITE data does not include a land use code that is well-matched to the proposed life sciences office/R&D use. This use would have more dispersed arrivals and departures than typical office buildings but would be more concentrated than land uses exclusively used for research and development. Trip generation data collected at several life sciences office/R&D sites in South San Francisco are used instead of ITE data because the uses are similar to the proposed project, and workers in the project area are expected to have similar automobile usage.[7]

Table 7 compares the ITE trip generation rates for office and R&D uses to the observed trip generation rates at the office/R&D sites in South San Francisco.

Table 7: Trip Generation Rate Comparison

Source	AM Peak Hour	PM Peak Hour
ITE – General Office Building (Land Use Code 710)[1]	1.16	1.15
ITE – Research and Development Center (Land Use Code 760)[1]	0.42	0.49
Life Sciences Office/R&D Mix[2]	0.83	0.92

Notes:
1. ITE Trip Generation (10th Edition)
2. Data collected by Fehr & Peers at Life Sciences Office/R&D in South San Francisco in November 2019.
Sources: ITE, Fehr & Peers, 2021.

Table 8 summarizes the automobile trip generation for the proposed project based on the ITE methodology and accounts for the non-automobile trips and trips generated by the existing site uses.

[7] Transportation surveys collected at these sites indicated an automobile mode share of 78 percent. Based on 2012-2016 American Community Survey 5-Year Estimates, workers in West Berkeley have a 75 percent automobile mode share.

Table 8: Project Automobile Trip Generation

Land Use	ITE Code	Size[1]	Weekday AM Peak Hour			Weekday PM Peak Hour		
			In	Out	Total	In	Out	Total
Phase 1 – Renovation of Existing Buildings Between Fourth and Fifth Streets								
Light Manufacturing[2]	110	74.8 KSF	46	6	52	6	41	47
Phase 1 Total Automobile Trips			**46**	**6**	**52**	**6**	**41**	**47**
Phase 2 – Parking Garage								
Existing Light Manufacturing[2]	*110*	*4.0 KSF*	*-3*	*-0*	*-3*	*-0*	*-3*	*-3*
Phase 2 Removed Existing Automobile Trips			***-3***	***0***	***-3***	***-0***	***-3***	***-3***
Phase 3 – 787 Bancroft Way								
Office/R&D[3]	-	125.8 KSF	89	15	104	22	94	116
Light Manufacturing[2]	110	33.3 KSF	20	3	23	3	18	21
Phase 3 Total Automobile Trips			**109**	**18**	**127**	**25**	**112**	**137**
Existing Light Manufacturing[3]	*110*	*2.4 KSF*	*-2*	*-0*	*-2*	*-0*	*-2*	*-2*
Existing Warehouse[4]	*150*	*77.8 KSF*	*-10*	*-3*	*-13*	*-4*	*-11*	*-15*
Phase 3 Removed Existing Automobile Trips			***-12***	***-3***	***-15***	***-4***	***-13***	***-17***
Phase 3 Net New Automobile Trips			**97**	**15**	**112**	**21**	**99**	**120**
Renovation of 716 Allston Way (Separate AUP Application)								
Office/R&D[3]	-	7.9 KSF	6	1	7	1	6	7
Light Manufacturing[2]	110	23.6 KSF	14	2	16	2	13	15
716 Allston Way Renovation Total Automobile Trips			**20**	**3**	**23**	**3**	**19**	**22**
Existing Warehouse[4]	*150*	*26.4 KSF*	*-3*	*-1*	*-4*	*-1*	*-4*	*-5*
716 Allston Way Renovation Removed Existing Automobile Trips			***-3***	***-1***	***-4***	***-1***	***-4***	***-5***
716 Allston Way Renovation Net New Automobile Trips			**17**	**2**	**19**	**2**	**15**	**17**
Project Net New Automobile Trips			**157**	**23**	**180**	**29**	**152**	**181**

Notes:
1. KSF = 1,000 square feet.
2. ITE Trip Generation (10th Edition) land use category 110 (General Light Industrial):
   AM Peak Hour: T = 0.70 * X (88% in, 12% out)
   PM Peak Hour: T = 0.63 * X (13% in, 87% out)
   1. Trip generation data collected by Fehr & Peers at life sciences office/R&D uses in South San Francisco:
      AM Peak Hour: 0.83 trips per KSF (85% in, 15% out)
      PM Peak Hour: 0.92 trips per KSF (19% in, 81% out)
   2. ITE Trip Generation (10th Edition) land use category 150 (Warehousing):
      AM Peak Hour: T = 0.17 * X (77% in, 23% out)
      PM Peak Hour: T = 0.19 * X (27% in, 73% out)

Source: Fehr & Peers, 2021.

Trip generation estimates for light manufacturing and warehouse spaces use ITE trip generation data, which is based on national surveys. Nationwide, 86 percent of workers commute via automobile, compared to 75 percent of workers in West Berkeley, but Table 7 does not adjust ITE trip generation rates to account for the potentially higher share of non-automobile use at the project site. This represents a conservative assumption to ensure that the analysis does not underestimate the net new automobile trips added to the local roadways.

Although the project would implement a Transportation Demand Management (TDM) Plan that would reduce the automobile trips generated by the project, the project trip generation does not account for the effectiveness of the TDM Plan in order to present a conservative estimate (See Chapter 4 for more detail on the project TDM Plan).

As shown in Table 8, the project is estimated to generate about 180 AM peak hour and 181 PM peak hour net new automobile trips.

3.3 Multi-Modal Trip Generation

Table 9 presents the project trip generation estimates for all travel modes for the project based on existing mode splits in West Berkeley.

Table 9: Project Trip Generation by Travel Mode

Mode	Mode Share Adjustment Factor[1]	AM Peak Hour	PM Peak Hour
Automobile	1.00	180	181
Transit	0.10	18	18
Bike	0.08	14	14
Walk	0.07	13	13
	Total Net Trips	**225**	**226**

Notes:
1. Based on the mode share estimates for workers in West Berkeley from the 2012-2016 American Community Survey 5-Year Estimates.

Source: Fehr & Peers, 2021.

3.4 Trip Distribution and Assignment

The trip distribution and assignment process is used to estimate how the vehicle trips generated by the project would be distributed across the roadway network. Trip distribution for the project is based on the trip distribution for office presented in the West Berkeley Circulation Master Plan (WBCMP), with modifications to reflect the project location and current traffic patterns in the area, and is consistent with Census data for home location of workers in West Berkeley. **Figure 7** shows the resulting peak hour trip distribution.

Trips generated by the project were assigned to the roadway network according to the trip distribution shown on Figure 7, which accounts for the turn restriction in the area, such as the prohibition on through movements and left-turns on eastbound and westbound Addison Street at Sixth Street. The trip assignment also accounts for the conversion of Bolivar Drive from two-way operations to one-way southbound operations as part of the proposed Berkeley Commons project. **Figure 8a** and **Figure 8b** present the locations of and peak hour project trip assignment at the study intersections during the AM and PM peak hours, respectively. **Figure 9** presents the peak hour project automobile trips generated by the proposed project at the study intersections.

Project Site XX% Project Trip Distribution

Figure 7

Project Trip Distribution

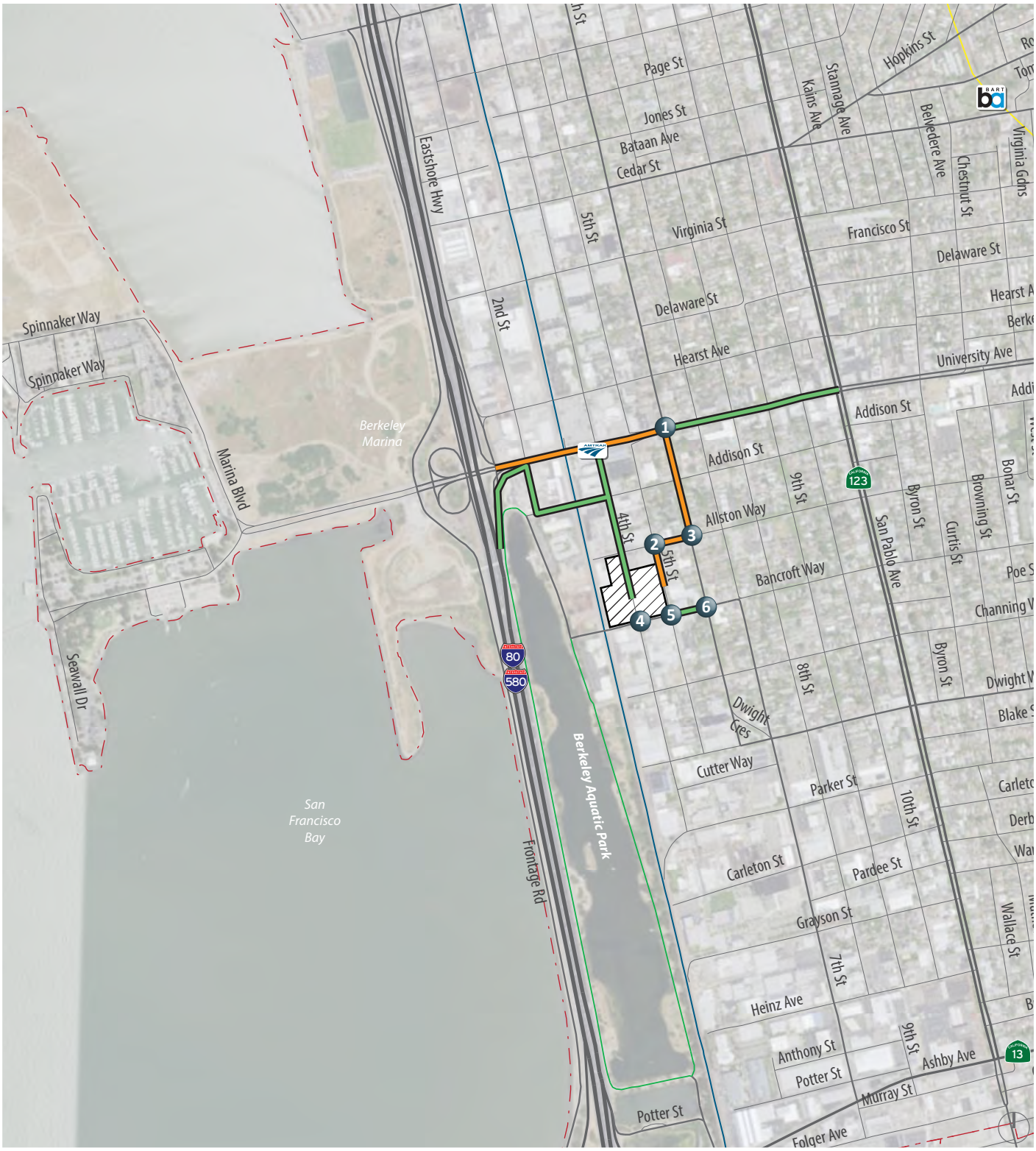
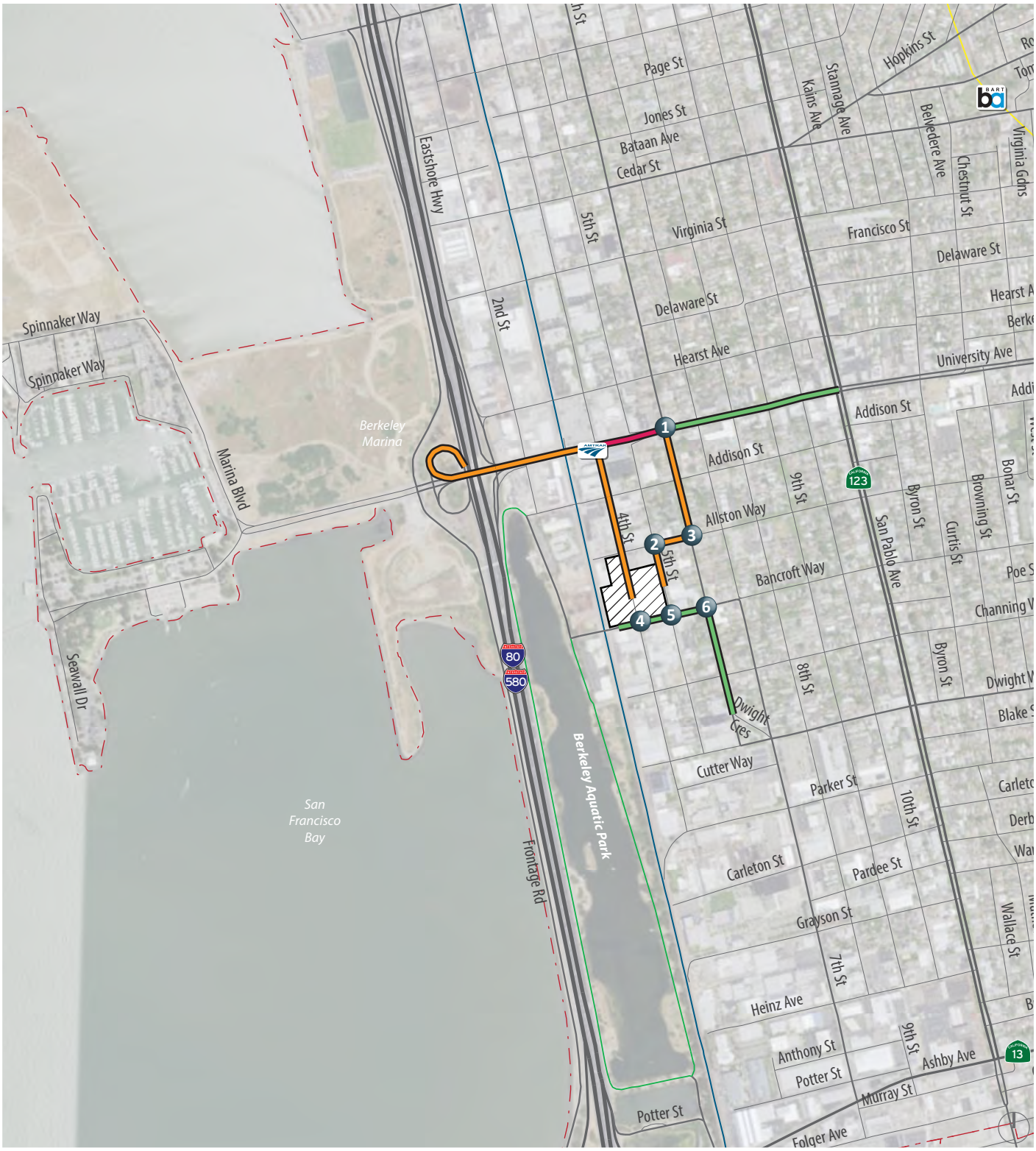


Figure 8a

AM Peak Hour Project Trip Assignment



Project Site

Study Intersection

Project Trip Assignment

100 or More

50 to 99

25 to 49

Figure 8b

PM Peak Hour Project Trip Assignment

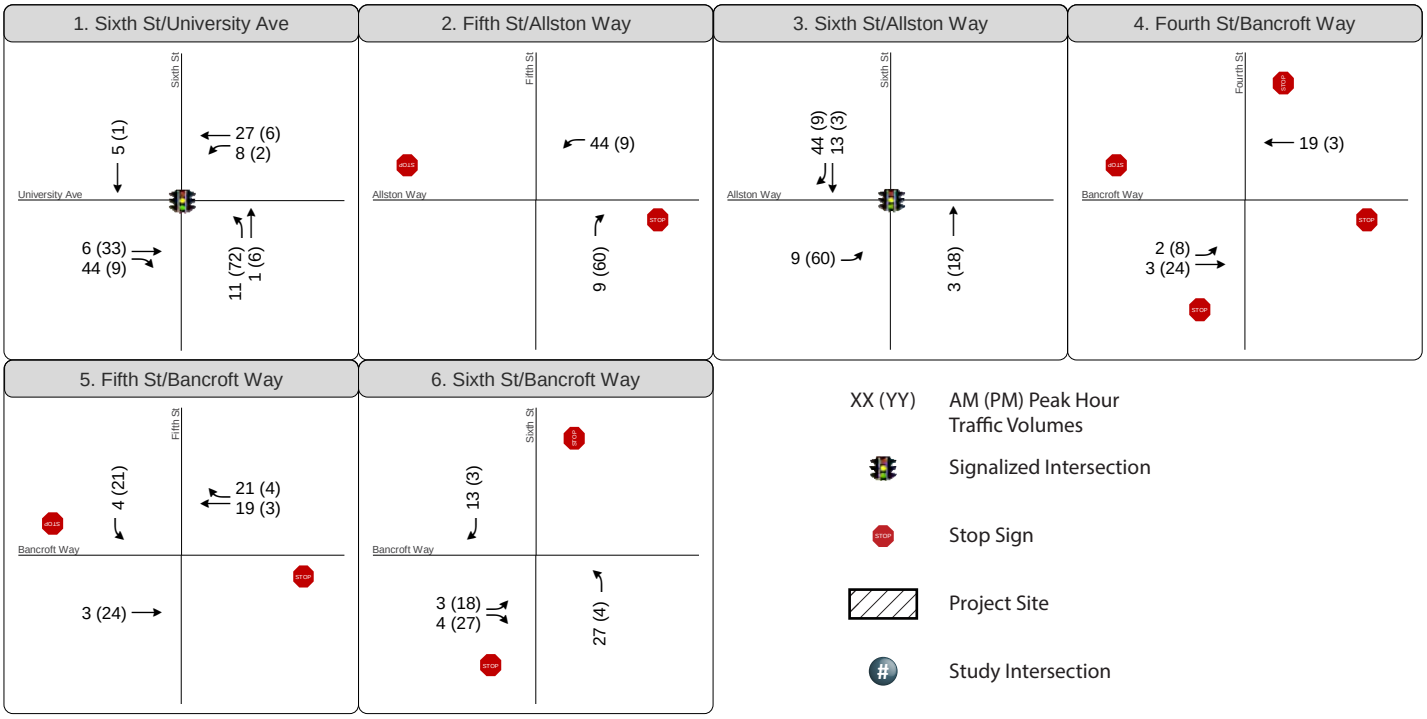


Figure 9

Peak Hour Project Trips

4. Vehicle Miles Traveled Assessment

In November 2020, the City of Berkeley adopted guidelines, thresholds of significance, and screening criteria for evaluating vehicle miles traveled (VMT) in CEQA documents, as required by the State for all CEQA documents published after July 1, 2020. This section assesses impacts of the project on VMT, in accordance with the adopted City guidelines.

4.1 California Senate Bill 743

California Senate Bill (SB) 743, passed in 2013, required the California Governor's Office of Planning and Research (OPR) to develop new CEQA guidelines for transportation impacts that eliminate driver-based estimates of delay, vehicular capacity, or traffic congestion and instead focuses on the environmental effects of vehicle travel. According to SB 743, these changes are intended to "more appropriately balance the needs of congestion management with statewide goals related to infill development, promotion of public health through active transportation, and reduction of greenhouse gas emissions."

OPR published updated guidelines to implement the requirements of SB 743 in December 2018. The updated guidelines state that VMT must be used to determine transportation impacts and that all lead agencies in California must use VMT-based thresholds of significance in CEQA documents published in July 2020 or later. The OPR guidance recommends evaluating VMT impacts using efficiency-based metrics, such as VMT per capita or VMT per worker.

4.2 VMT Screening

Some land use development projects have characteristics that are highly likely to meet thresholds for a less-than-significant impact on VMT, and the OPR guidance suggests the use of screening criteria to assess whether a project impacts on VMT can be presumed to be less-than-significant.

The City's adopted VMT Criteria and Thresholds includes the following screening criterion applicable to the proposed project. VMT impacts could be presumed to be less than significant if the screening criterion outlined below is met:

- Transit Priority Areas (TPAs): The project is located within a 0.5-mile walkshed of a major transit stop[8] or within a 0.25-mile walkshed of a stop along a high-quality transit corridor[9] and satisfies the following:
    - Has a Floor Area Ratio (FAR) of 0.75 or greater for office uses

[8] Major transit stop is defined as an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods (Pub. Resources Code, § 21064.3).

[9] High-quality transit corridor is defined as a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours (Pub. Resources Code, § R21155).

- Includes 200,000 square feet or less of office or commercial space
- Does not include more parking supply than the project's estimated demand
- Is consistent with the City's General Plan, an applicable Specific Plan, or an applicable Sustainable Communities Strategy (as determined by the City, with input from MTC)
- Does not have project-specific or location-specific information that indicates that the project will generate significant levels of VMT

The project is located about 0.3 miles from the Berkeley Amtrak station, which is considered a major transit stop. The project would satisfy the Transit Priority Areas criterion because it would also meet the following five conditions:

- The project would have a Floor Area Ratio of 0.9, which is greater than 0.75.
- The project would develop about 159,100 square feet of new office or commercial space at 787 Bancroft Way, and renovations to existing space would result in about 17,200 square feet of new office or commercial space in existing buildings. In total, the project would result in about 176,300 square feet of new office or commercial space, which is less than 200,000 square feet.
- The project includes 525 total parking spaces, consisting of the 415-space parking garage, the 97-space surface parking lot at 787 Bancroft Way, and the 13-space surface parking lot on Fifth Street. In total, the project would develop or renovate about 133,700 square feet of office/R&D space and 131,700 square feet of light manufacturing space, which is estimated to accommodate about 660 to 800 employees.[10] Based on the driving mode split for workers in West Berkeley from US Census data, parking demand is estimated to be 0.69 parking spaces per employee, corresponding to parking demand of about 450 to 560 spaces. Therefore, the parking supply serving the project is not greater than the estimated parking demand.
- The project is consistent with the City of Berkeley General Plan.
- The project does not have other project-specific or location-specific attributes that would indicate that the project would generate significant levels of VMT.

Thus, the proposed project would satisfy the Transit Priority Area criterion and is therefore presumed to have a less-than-significant impact on VMT.

4.3 Transportation Demand Management

Although the project would not have a significant impact on VMT, and no mitigation is required, it would implement a TDM Plan to reduce VMT, automobile trip generation, and parking demand through measures that discourage the use of automobiles and encourage the use of other travel modes.

[10] Life sciences uses typically have about 3.0 to 3.5 employees per thousand square feet, and light manufacturing uses typically have about 2.0 to 2.5 employees per thousand square feet.

Appendix D provides the detailed TDM Plan for the project. The TDM Plan, which would be implemented at the time of the occupancy, would include the following strategies:

a. Provide shuttle service between the project and a BART station during weekday peak commute periods (6:00 AM to 10:00 AM and 3:00 PM to 7:00 PM). The project would also explore the feasibility, and if feasible, will coordinate the shuttle service with existing shuttle services, and/or other employers in West Berkeley. Shuttle service would be adjusted based on ridership.
b. Provide bike lockers, showers, personal lockers, and a repair station on-site to encourage bicycling to the site.
c. Coordinate with the City of Berkeley and/or regional agencies to facilitate the potential installation of a BayWheels bikeshare station along the project frontage.
d. Offer to provide free parking spaces for at least two car share vehicles (ZIP Car, etc.).
e. Offer carpool/ride-matching services, such as ZimRide, ComoVee, or 511.org RideShare, to pair employees interested in forming commute carpools.
f. Provide at least 10 spaces of preferential carpool parking, including free parking for carpoolers if employees are charged for on-site parking. Carpool parking spaces not occupied by 10:00 AM would be available to other vehicles.
g. Require tenants to provide full or partial transit subsidy to project employees. Tenants may offer one of the following to employees that request it:[11]
    - A monthly commuter check (or alternatively Clipper Card, which is accepted by BART, AC Transit, and other major transit providers in the Bay Area)
    - Subsidized AC Transit bus pass
    - Subsidized Capital Corridor monthly ticket
h. Require tenants to provide pre-tax commuter benefits for project employees.
i. Regularly provide project tenants and employees information about various transportation options in the area and the TDM strategies provided by the project. The main lobby of each major project building shall also provide all the information on transportation options, such as a TransitScreen.
j. Provide information on the Bay Area Commuter Benefits Program to all building tenants. As of September 30, 2014, Bay Area employers with 50 or more full-time employees within the Bay Area Air Quality Management District (Air District) geographic boundaries are required to register and offer commuter benefits to their employees in order to comply with Air District Regulation 14, Rule 1, also known as the Bay Area Commuter Benefits Program. Employers must select one of four Commuter Benefit options to offer their employees: a pre-tax benefit, an employer-provided subsidy, employer-provided transit, or an alternative commute benefit. (Information about Commute Benefits Program is at 511.org/employers/commuter/overview.)

[11] This analysis assumes that a transit fare subsidy of about $2.50 per employee per weekday (value to rider, not cost to employer) will be available to all site employees.

Table 10 summarizes the estimated effectiveness of the TDM Plan components in reducing the project VMT. The effectiveness of the strategies is primarily based on research compiled in *Quantifying Greenhouse Gas Mitigation Measures* (California Air Pollution Control Officers Association [CAPCOA], August 2010), which is a resource for local agencies to quantify the benefit, in terms of reduced travel demand, of implementing various TDM strategies. It is estimated that the proposed TDM Plan would reduce the project-generated VMT by between eight and fifteen percent. The project will monitor the effectiveness of the TDM strategies and adjust them based on effectiveness.

Table 10: TDM Plan VMT Reduction Estimates

TDM Strategy	Description	Estimated VMT Reduction[1]
BART Shuttle	Provide peak commute period shuttle service to BART	3% - 6%
Bicycle Amenities	Provide secure bicycle parking, showers and lockers, and repair station	<1%
Bike Share	Allow and facilitate installation of a potential BayWheels bikeshare station along the site frontage	
Carshare Parking Spaces	Dedicate on-site carshare parking spaces	<1%
Carpool and Ride-Matching Assistance	Assist project employees in forming carpools and provide preferential carpool parking spaces	1%
Transit Fare Subsidy	Require tenants to provide a monthly transit subsidy to employees	4% - 8%[2]
Pre-Tax Commuter Benefits	Require tenants to provide pre-tax commuter benefits to employees	
Marketing and Education	Active marketing and education of employees on various commuting options	N/A[3]
	Total Estimated Vehicle Trip Generation	**8% – 15%**

Notes:
1. Based on *Quantifying Greenhouse Gas Mitigation Measures* (California Air Pollution Control Officers Association [CAPCOA], August 2010)
2. Assuming a transit subsidy of about $2.50 per day per employee (value to transit user and not necessarily the cost) available to all employees.
3. The effectiveness of this strategy cannot be quantified at this time. This does not necessarily imply that the strategy is ineffective. It only demonstrates that existing literature does not provide a robust methodology for calculating its effectiveness. In addition, many strategies are complementary to each other and isolating their specific effectiveness may not be feasible.

Source: Fehr & Peers, 2021.

5. Traffic Operations Analysis

As described in previous chapters, automobile delay, LOS, and other similar measures of vehicular capacity or traffic congestion can no longer be used to identify significant impacts under CEQA. This report evaluates the effects of the proposed project on local intersection operations at six key intersections for informational purposes. This chapter summarizes intersection operations at the study intersections under Near-Term and Near-Term Plus Project conditions and identifies substantial effects based on the City of Berkeley thresholds for intersection operations.

5.1 Near-Term and Near-Term Plus Project Intersection Operations

Near-Term conditions represent existing traffic plus traffic volumes from approved but not yet constructed and occupied developments that are expected to be operational in the near future. The projects included in the Near-Term scenarios include:

- 600 Addison Street (approved) – would consist of about 462,000 square feet of office/R&D space west of the railroad tracks between Addison Street and Bancroft Way.
- 1914 Fifth Street (proposed) - would consist of 257 multi-family residential units and about 24,600 square feet of commercial space on Fifth Street between Hearst and University Avenues.
- Berkeley Bayer Campus (proposed) – would expand the current project generally located west of Seventh Street between Dwight Way and Grayson Street from about 1,087,000 square feet of space and 1,000 employees to about 1,738,000 square feet of space and 2,000 employees.

The intersection volumes under the Near-Term Conditions were estimated by add the trips generated by the development projects listed above to the existing intersection volumes. **Figure 10** shows the intersection volumes under the Near-Term conditions. Project trips were added to the Near-Term conditions to develop traffic volumes for Near-Term Plus Project conditions, shown on **Figure 11**. Roadway geometries and traffic controls under Near-Term conditions were assumed to be the same as existing conditions.

The Near-Term and Near-Term Plus Project intersection operations analysis results are summarized in **Table 11**. Detailed LOS calculation worksheets are provided in Appendix B. As shown in Table 11, all signalized and all-way stop-controlled intersections are expected to operate at LOS D or better during the AM and PM peak periods under Near-Term and Near-Term Plus Project conditions, as are all movements of the Allston Way/Fifth Street and Bancroft Way/Fifth Street side-street stop-controlled intersections. The eastbound movement of the Bancroft Way/Sixth Street side-street stop-controlled intersection would operate at LOS F during the PM peak hour under both Near-Term and Near-Term Plus Project conditions.

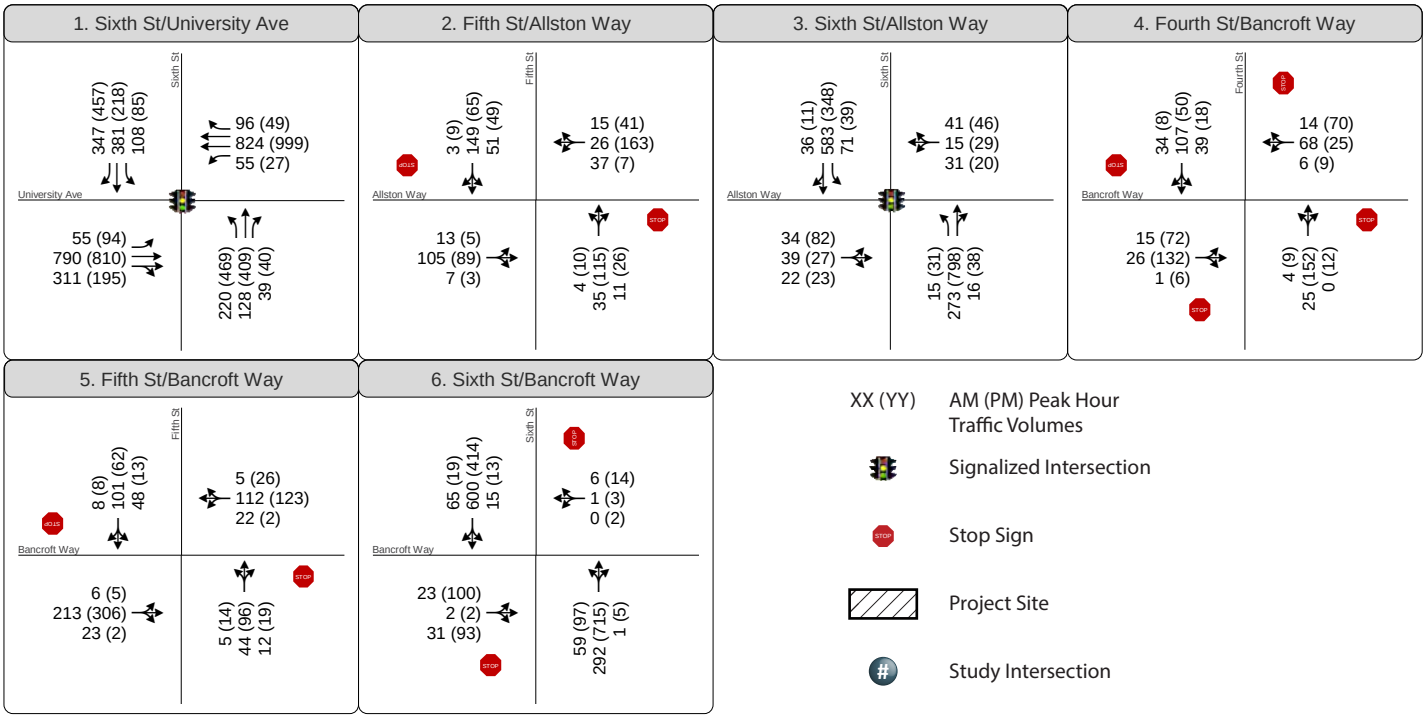


Figure 10

Near-Term without Project Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls

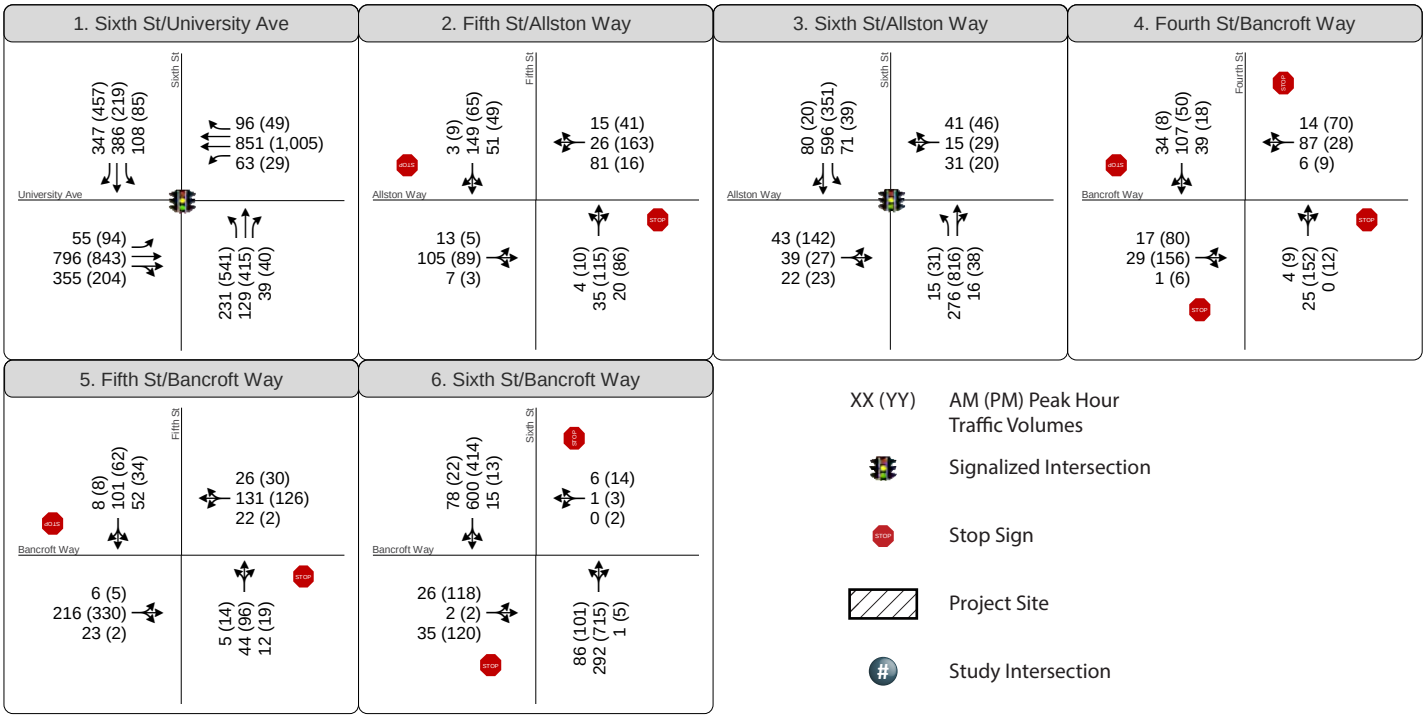


Figure 11

Near-Term Plus Project Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls

Table 11: Near-Term Plus Project Conditions – Study Intersection LOS Summary

Intersection	Traffic Control[1]	Peak Hour	Near-Term		Near-Term Plus Project		Substantial Effect?
			Delay[2] (seconds)	LOS[3]	Delay[2] (seconds)	LOS[3]	
1. University Avenue/ Sixth Street	Signal	AM	49	D	51	D	No
		PM	51	D	55	D	No
2. Allston Way/Fifth Street	SSSC	AM	9 (16)	A (C)	11 (19)	B (C)	No
		PM	7 (15)	A (C)	8 (17)	A (C)	No
3. Allston Way/Sixth Street	Signal	AM	19	B	18	B	No
		PM	21	C	21	C	No
4. Bancroft Way/ Fourth Street	AWSC	AM	9	A	9	A	No
		PM	10	B	11	B	No
5. Bancroft Way/Fifth Street	SSSC	AM	8 (22)	A (C)	8 (25)	A (D)	No
		PM	6 (21)	A (C)	8 (24)	A (C)	No
6. Bancroft Way/Sixth Street	SSSC	AM	2 (26)	A (D)	3 (31)	A (D)	No
		PM	33 **(>150)**	D **(F)**	**57 (>150)**	**F (F)**	**Yes**

Notes: Intersections operating at LOS E or LOS F in **bold**.

1. SSSC = Side-Street Stop-Controlled; AWSC = All-Way Stop-Controlled
2. Average intersection delay and LOS based on the 2010 HCM method. Average delay is reported for signalized and all-way stop-controlled intersections. Average intersection and worst-movement delays, respectively, are reported for side-street stop-controlled intersections.
3. Estimated based on 2010 HCM delay thresholds.

Source: Fehr & Peers, 2021.

5.2 Near-Term and Near-Term Plus Project Peak Hour Signal Warrant Assessment

As described in Chapter 2, the California MUTCD includes eight signal warrants, and meeting one or more of the signal warrants could justify signalization of a stop-controlled intersection. This analysis evaluates the California MUTCD peak hour vehicular volume warrant (Warrant 3B) for urban conditions to determine if the traffic added by the project would result in the stop-controlled intersections needing to be signalized.

The peak hour traffic signal warrant was evaluated for the four unsignalized study intersections under Near-Term and Near-Term Plus Project conditions based on the volumes, intersection controls, and roadway configurations presented on Figure 10 and Figure 11. As shown in **Table 12**, the Bancroft Way/Sixth Street intersection would meet the California MUTCD peak hour signal warrant in the PM peak hour under both Near-Term and Near-Term Plus Project conditions. **Appendix C** provides the signal warrant worksheets.

Table 12: Near-Term Plus Project Conditions – Study Intersection Peak Hour Signal Warrant Summary

Intersection	Control	Meet Peak Hour Signal Warrant under Near-Term Conditions?	Meet Peak Hour Signal Warrant under Near-Term Plus Project Conditions?
2. Allston Way/Fifth Street	Side-Street Stop	No	No
4. Bancroft Way/Fourth Street	All-Way Stop	No	No
5. Bancroft Way/Fifth Street	Side-Street Stop	No	No
6. Bancroft Way/Sixth Street	Side-Street Stop	**Yes (PM)**	**Yes (PM)**

Notes:
1. Based on the application of California MUTCD Warrant 3B.

Source: Fehr & Peers, 2021.

5.3 Substantial Effects and Improvement Measures

Intersection operations under Near-Term Plus Project conditions were compared to intersection operations under Near-Term conditions using the criteria described in Chapter 1. The project would result in a substantial effect at the Bancroft Way/Sixth Street intersection because it meets the following criteria:

- The westbound approach (critical approach) of the intersection would operate at LOS F in the PM peak hour under Near-Term Plus Project conditions
- The intersection would meet the MUTCD signal warrant in the PM peak hour under Near-Term Plus Project conditions
- The project would add more than ten vehicles to the critical approach in the PM peak hour

The project is expected to add 47 AM peak hour and 52 PM peak hour trips to this intersection.

Currently, the approved 600 Addison Street project is expected to install a signal at the Bancroft Way/Sixth Street intersection prior to the occupancy of that project. With the implementation of this measure, the signalized Sixth Street/Bancroft Way intersection would operate at LOS A during the AM peak hour and LOS B during the PM peak hour, mitigating the substantial effect.

6. Site Access, Circulation, and Parking

Fehr & Peers reviewed project site plans and the existing street network near the project site to evaluate safety, access, and circulation for all travel modes accessing the project. This chapter provides the findings of that assessment.

6.1 Automobile Access and Circulation

Automobile access for the project would utilize the parking garage, surface parking lot at 787 Bancroft Way, or the surface parking lot on Fifth Street. This section assesses access and circulation for each of these facilities.

6.1.1 Parking Garage

The project would provide a five-level parking garage accommodating 415 parking spaces. Automobiles would access the garage via full-access driveways on Fourth Street about 180 feet south of Allston Way and on Fifth Street about 240 feet south of Allston Way. Each driveway would provide one entering lane and one exiting lane, with 11-foot wide lanes.

Garage access would be controlled by gates located approximately 20 feet inside the garage. This would provide adequate space for one vehicle to queue fully inside the garage. Based on the expected number of vehicle arrivals during the AM peak hour and the expected distribution of vehicles between the two driveways, 95th percentile queues[12] are expected to be two cars long at the Fourth Street driveway and one car long at the Fifth Street driveway.[13] The one-car queues on Fifth Street can be accommodated within the garage entry. However, the two-car queues on Fourth Street would result in one vehicle spilling back on the adjacent sidewalk or street.

Considering the low traffic volumes on Fourth Street and that the queues are expected to dissipate quickly, the queue spillover is not expected to interrupt traffic flow or block upstream driveways or intersections. The project would also provide "Do Not Block Sidewalk" signage at both driveways that activates when vehicle queues is detected to maintain a clear path of travel for pedestrians on the sidewalk.

[12] 95th percentile queue is defined as the queue length that has only a five percent probability of being exceeded during the analyzed peak hour.

[13] Based on the project trip generation, distribution, and assignment, the parking garage is expected to serve up to about 180 total inbound trips during the AM peak hour, with about 105 entering on Fourth Street and 75 entering on Fifth Street. Assuming that the garage gates would be controlled by automatic ticket dispensers, each gate can serve about 450 vehicles per hour. Assuming a normal distribution for vehicle arrivals, the 95th percentile queues during the AM peak hour on a typical weekday are estimated to be about two vehicles for the Fourth Street driveway and one vehicle for the Fifth Street driveway.

The parking garage driveways would provide adequate sight distance between exiting motorists and pedestrians on the adjacent sidewalk. Adequate sight distance is defined as a clear line-of-sight between a motorist ten feet back from the sidewalk and a pedestrian 10 feet away on each side of the driveway. The project would designate at least 20 feet of red curb on the north and south sides of the garage driveways on Fourth and Fifth Streets to ensure adequate sight distance between exiting motorists and cyclists or motorists on Fourth and Fifth Streets.

Internal circulation in the garage would be provided by a single two-way drive aisle with parking spaces on both sides. The drive aisle would be about 24 feet wide, providing adequate space for vehicles to circulate through the garage and maneuver into and out of parking spaces.

787 Bancroft Way Surface Parking Lot

The project would provide a surface parking lot at 787 Bancroft Way accommodating 97 parking spaces. Automobiles would access the parking lot via a 20-foot wide full-access driveway on Bancroft Way about 210 feet west of Fourth Street and 35 feet east of the railroad control gate. The 787 Bancroft Way development also provides truck loading spaces, accessed on Bancroft Way about 90 feet east of the parking lot driveway. The Truck Access and Loading section of this chapter describes truck access for the project.

The parking lot and loading space driveways would provide adequate sight distance between exiting motorists and pedestrians on the adjacent sidewalk. The project would designate red curb on the north side of Bancroft Way between the railroad gate and the parking lot driveway, as well as 25 feet on the east side of the parking lot driveway, to ensure adequate sight distance between exiting motorists and cyclists or motorists on Bancroft Way. No gates would be provided at the parking lot driveway entrance, which would minimize queueing on Bancroft Way. The At-Grade Railroad Crossings section of this chapter assesses the expected queuing on Bancroft Way with the project.

Internal circulation for the 787 Bancroft Way parking lot would be provided by a two-way drive aisle that connects the driveway with a one-way counterclockwise drive aisle. The two-way drive aisle would have perpendicular parking spaces on the west side and parallel truck loading spaces on the east side. When the truck loading spaces are occupied, the drive aisle would be about 15 feet wide, which would provide adequate space for most vehicles to pass and maneuver into and out of the parking spaces. Larger vehicles may need to wait for vehicles in the opposite direction to go through before proceeding when one or more of the parallel loading spaces are occupied. The one-way counterclockwise drive aisle would be generally 24 feet wide with perpendicular parking spaces on both sides, and it would narrow to 17.5 feet at pinch points. The parking lot would provide adequate space for vehicles to circulate through the parking lot and maneuver into and out of parking spaces.

Fifth Street Surface Parking Lot

The project would also provide a 13-space surface parking on Fifth Street, which would replace an existing 30-space parking lot. This parking lot would be accessed through a 24-foot curb cut and would provide

perpendicular parking spaces on both sides of a 28-foot two-way drive aisle. The drive aisle would provide adequate space for vehicles to maneuver into and out of parking spaces.

The parking lot driveway would provide adequate sight distance between exiting motorists and pedestrians on the adjacent sidewalk. The project would designate at least 20 feet of red curb on the north and south sides of the surface parking lot driveway on Fifth Street to ensure adequate sight distance between exiting motorists and cyclists or motorists on Fifth Street.

6.1.2 Truck Access and Loading

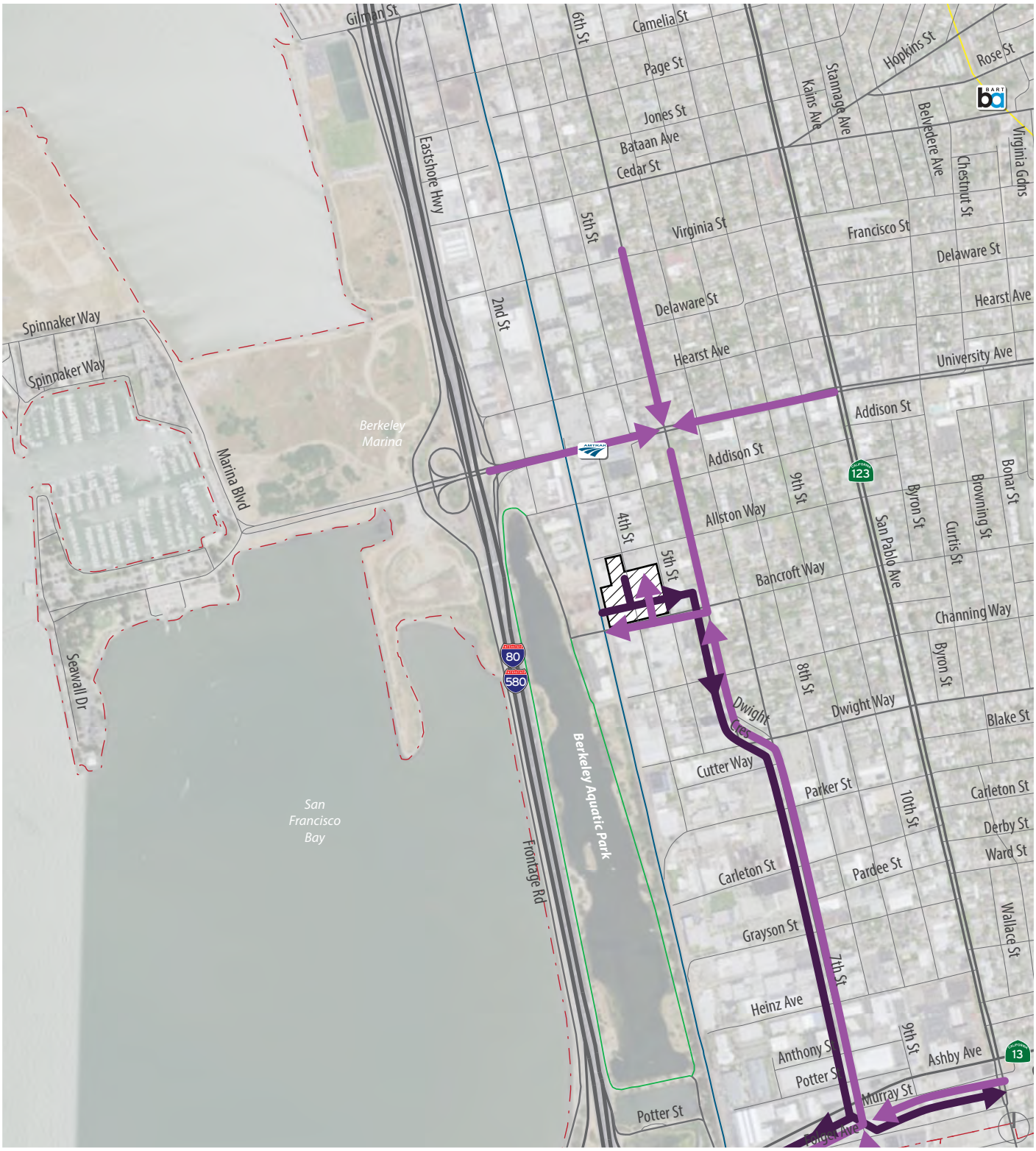
City of Berkeley Municipal Code (Section 23E.32.030) requires one off-street loading space for the first 10,000 square feet of new commercial or manufacturing floor area, and one space for each additional 25,000 square feet of floor area. Off-street loading spaces are required to have minimum dimensions of 12 feet wide and 25 feet long, with a minimum vertical clearance of 14 feet.

Figure 12 shows the preferred truck routes to and from the site. Considering the roadway network serving the project, all trucks are expected to travel to and from the project from the east. Most trucks would access the site from either northbound or southbound Sixth Street and turn at Allston Way to access the parking garage or Bancroft Way to access 787 Bancroft Way. Most trucks would leave the project site by following the same path of travel in the opposite direction.

787 Bancroft Way and 716 Allston Way

The proposed 787 Bancroft Way building would add about 159,100 square feet of new commercial space, and the renovations to 716 Allston Way would result in about 5,100 square feet of new commercial floor area; therefore, seven off-street loading spaces would be required. The surface parking lot at 787 Bancroft Way would provide five parallel loading spaces on the east side of the drive aisle of the parking lot and two enclosed loading spaces with access on Bancroft Way east of the parking lot driveway. All loading spaces would be at least 12 feet wide and 25 feet long, with at least 14 feet of vertical clearance, meeting code requirements for loading space quantity and dimensions. The project would also provide 44 feet of yellow curb for commercial loading on the Bancroft Way frontage of 787 Bancroft Way just west of the enclosed loading spaces.

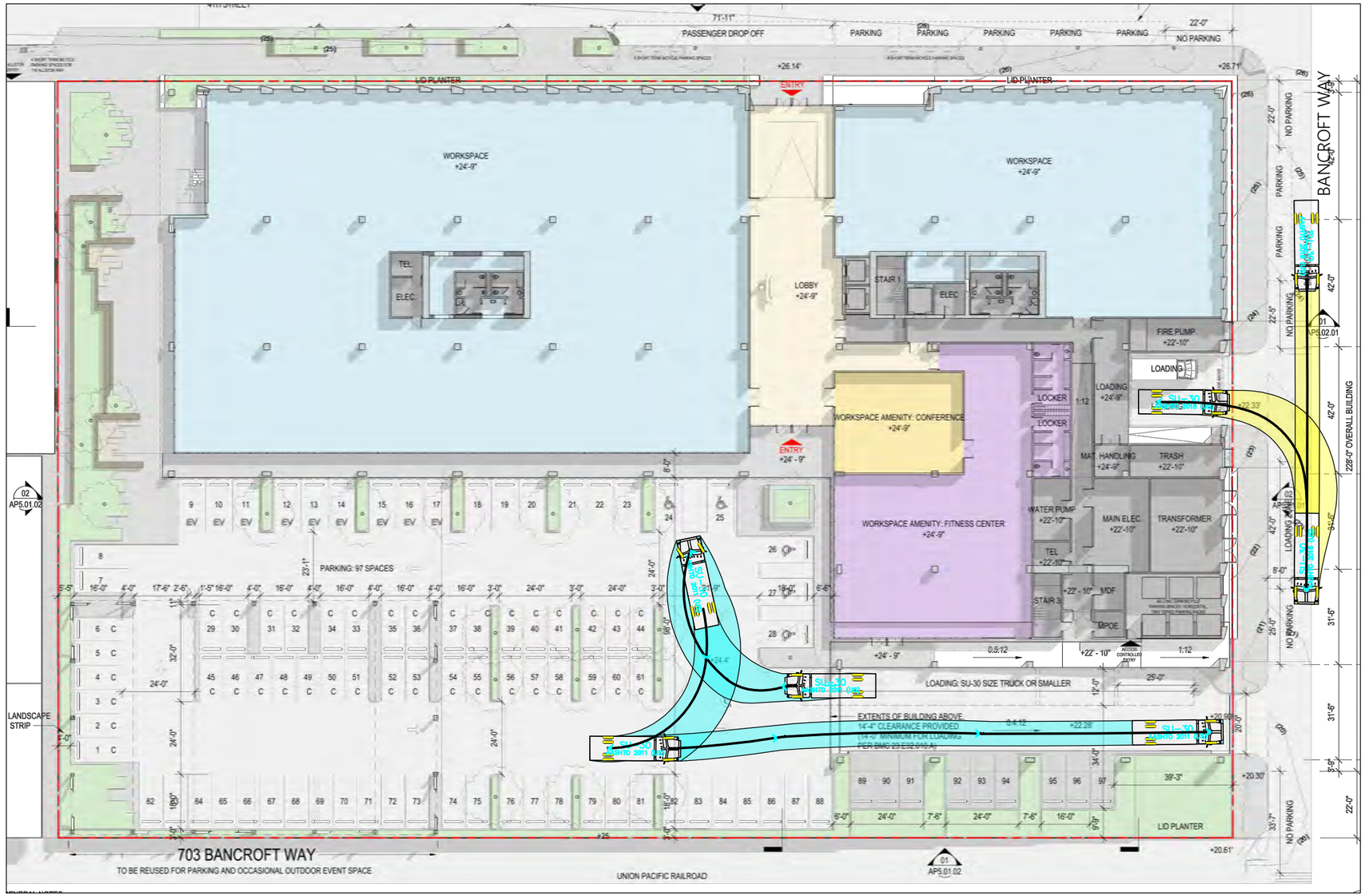
Trucks accessing the parallel loading spaces in the surface parking lot at 787 Bancroft Way would enter the parking lot through the driveway head-first and would maneuver into the spaces either head-first or by passing the space and then backing into it. To leave the loading spaces, trucks would perform a three-point turn in the surface parking lot, as shown on **Figure 13**. The parking lot would restrict truck access to SU-30 or smaller trucks, which would have adequate space to maneuver.



Project Site Inbound Truck Route Outbound Truck Route

Figure 12

Preferred Truck Routes



SU-30 TRUCK CIRCULATION

N

N.T.S.

Figure 13

787 BANCROFT WAY
FLOOR 01 PLAN - TRUCK TURNING

The enclosed loading spaces at 787 Bancroft Way would be accessed via a driveway about 90 feet east of the surface parking lot driveway. Considering the roadway network serving the project site, trucks are expected to access the loading spaces at 787 Bancroft Way from the east. Trucks accessing the enclosed spaces would approach on westbound Bancroft Way and back into the loading spaces, and they would leave head-first on eastbound Bancroft Way. Trucks would have adequate space to maneuver into and out of the loading spaces, as shown on Figure 13.

Renovated Buildings

The building renovations between Fourth and Fifth Streets would result in about 12,100 square feet of new commercial floor area; therefore, one off-street loading space would be required. The parking garage would provide one enclosed loading space, with access to 2229 Fourth Street via a lift. The loading space would be about 50 feet long and 12 feet wide with at least 14 feet of vertical clearance, meeting code requirements for quantity and dimensions.

Truck access to the loading space would be provided via a driveway on Fourth Street south of the main garage driveway. Trucks would approach on northbound or southbound Fourth Street, back into the loading space, and leave head-first on Fourth Street. Trucks would have adequate space to maneuver into and out of the loading space.

6.2 At-Grade Railroad Crossings

The project would be located just west of active railroad tracks, and the 787 Bancroft Way building would be adjacent to an at-grade rail crossing on Bancroft Way. The at-grade crossing provides automated gate arms on the vehicular approach directions and flashing warning devices, and the pedestrian crossings do not meet ADA standards.

The project is estimated to add about 15 AM and 3 PM peak hour vehicles to the crossing, increasing the total traffic volume crossing the at-grade crossing under Near-Term Plus Project conditions to about 165 vehicles during the AM peak hour and 255 vehicles during the PM peak hour.

The project's driveway on Bancroft Way would be about 35 feet east of the at-grade crossing, providing queueing space for one eastbound vehicle on Bancroft Way turning left into the parking lot. The project proposes to designate red curb on the south side of Bancroft Way between the railroad gate and 25 feet east of the parking lot driveway to allow vehicles traveling east on Bancroft Way to travel around a vehicle waiting to turn left into the parking lot and eliminate potential vehicle queue spillover on the railroad tracks. As discussed previously, no gates would be provided at the parking lot driveway entrance, which would further minimize queueing.

Table 13 summarizes the average and 95th percentile queues at the 787 Bancroft Way driveway and the proposed 600 Addison Street driveway on Bancroft Way during the AM and PM peak hours for typical operations under Near-Term Plus Project conditions. The queues were estimated using SimTraffic

software.[14] As shown in Table 13, queues are not expected to spill back and block the at-grade crossing under typical operating conditions.

Table 13: Queues at Intersections Adjacent to Railroad Crossings

Location	Queue Storage Length (feet)	AM Peak Hour Average and 95th Percentile Queues in feet[1]	PM Peak Hour Average and 95th Percentile Queues in feet[1]
Eastbound Bancroft Way at 787 Bancroft Way Parking Lot Driveway	35	<20 (<20)	<20 (<20)
Westbound Bancroft Way at 600 Addison Street Garage Driveway	90	<20 (<20)	<20 (<20)

Notes:
1. Average (95th percentile) queues as calculated by SimTraffic Software based on average of 10 simulation runs.
Source: Fehr & Peers, 2021.

In addition to automobile traffic, the project would increase the number of pedestrians and cyclists crossing the at-grade crossing.

The 600 Addison Street project is conditioned to improve the existing at-grade railroad crossing on Bancroft Way, and the 600 Addison Street project is coordinating with the City of Berkeley, UPRR, and the California Public Utilities Commission (CPUC) to identify improvements at the at-grade crossing. The improvements under consideration may include:

- Improve the automatic gate and warning devices at the crossing
- Eliminate the on-street parking on the north side of Bancroft Way west of the railroad tracks.
- Improve the sidewalk on the north side of Bancroft Way, including across the railroad tracks, to meet ADA requirements

If these improvements have not been implemented prior to the occupancy of 787 Bancroft Way, then the proposed project shall coordinate with the City of Berkeley, UPRR, and CPUC to identify and implement improvements at the at-grade railroad crossing on Bancroft Way.

[14] SimTraffic, is the companion microsimulation software to Synchro. It is used for modeling and simulating traffic operations based on the behavior of individual drivers in a street network. The software accounts for the physical features of the transportation system, traffic flow conditions, and driver behavior characteristics to estimate performance measures that describe traffic operations, such as queues. SimTraffic was used to calculate the queues on Bancroft Way between the proposed 600 Addison Street driveway and Fourth Street. Microsimulation programs, such as SimTraffic, incorporate the element of randomness inherent in traffic flow. Therefore, to average out the random fluctuations and obtain a statistically more significant result, a microsimulation model should be run several times and the average of the runs should be reported. For this study, the SimTraffic files were each run ten times.

6.3 Bicycle Access and Circulation

Bicycle access for the project would be provided via Class III bike routes on Bancroft Way and Fourth Street, which connect with Class II bicycle lanes on Sixth Street and bicycle boulevards on Ninth Street and Channing Way. The Class I Aquatic Park Path is located about one block west of the project, and access to the Bay Trail is provided through the Eastshore Pedestrian Overcrossing about 0.3 miles northwest of the project. Additionally, the City of Berkeley 2017 Bicycle Plan identifies Addison Street as a future bicycle boulevard.

Automobile traffic generated by the project would increase traffic on designated bicycle facilities serving the project, especially on Bancroft Way and Fourth Street. Both streets include pavement markings that notify drivers that they are on a shared-mode facility, and these streets would remain low-volume streets with the addition of project traffic.

The nearest Bay Wheels bikeshare station is located on Addison Street just east of Fourth Street, about 0.1 miles north of the project.

As shown in Table 9, the project is estimated to generate about 14 AM peak hour and 14 PM peak hour bicycle trips. Project generated bicycle trips would be served by adjacent bicycle facilities described above which currently operate under capacity.

6.4 Pedestrian Access and Circulation

Primary pedestrian access for 787 Bancroft Way would be provided via the building lobby, with entrances on Fourth Street and on the west side of the building adjacent to the surface parking lot. Pedestrian access for the parking garage would be provided via a pedestrian entrance on Fourth Street between the main garage driveway and the loading space driveway. Primary pedestrian access for the renovated buildings between Fourth Street and Fifth Street would be provided via a walkway between 2233 Fourth Street and 2246 Fifth Street.

Fourth Street currently provides 12-foot sidewalk on the west side of the street along the frontage of 787 Bancroft Way and 716 Allston Way and on the east side of the street along the frontage of the parking garage and the renovated existing buildings. The project would maintain the existing sidewalk widths, providing a six-foot pedestrian through zone, a four-foot tree well, and a two-foot furniture/planter zone on both sides of the street.

Bancroft Way, Fifth Street, and Allston Way currently provide 12-foot sidewalks along the project frontages. The project would maintain the existing sidewalk widths along these segments.

The following intersections are located adjacent to the project:

- The Bancroft Way/Fourth Street intersection is an all-way stop-controlled intersection and provides standard crosswalk markings on the east and south approaches. Diagonal curb ramps with truncated domes are provided at all four corners of the intersection.

- The Bancroft Way/Fifth Street intersection is a side-street stop-controlled intersection with stop signs on the Fifth Street approaches. Standard crosswalk markings are provided on all approaches. Diagonal curb ramps with truncated domes are provided at all four corners of the intersection.
- The Allston Way/Fourth Street intersection is a side-street stop-controlled intersection with stop signs on the Allston Way approaches. Standard crosswalk markings are provided on the west and south approaches. Diagonal curb ramps are provided at all four corners of the intersection. The northeast and southeast curb ramps provide truncated domes.

The project proposes to provide marked crosswalks on all four approaches of the Bancroft Way/Fourth Street and Allston Way/Fourth Street intersections and provide curb ramps with truncated domes at all four corners of the Allston Way/Fourth Street intersection.

The project proposes to provide an uncontrolled midblock marked crosswalk on Fourth Street, connecting the parking garage and buildings on the east side of the street and the main lobby entrance for the 787 Bancroft Way development on the west side of the street, approximately 225 feet north of Bancroft Way. Based on the traffic volumes and speeds on Fourth Street, the expected pedestrian crossing demand between the project parking garage and the 787 Bancroft Way lobby entrance would meet FHWA's recommendations for an uncontrolled marked midblock crosswalk.[15]

The project would provide nighttime pedestrian-scale lighting and advanced "Yield Here to Pedestrians" signs and yield lines at the crosswalk, as well as high-visibility crosswalk markings and curb extensions on both sides of the street. These improvements are consistent with the FHWA's *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations (2018)* for two-lane streets with average daily traffic (ADT) of less than 9,000 and vehicle speeds of 30 miles per hour or less.

6.5 Transit Ridership and Access

Transit service providers in the vicinity of the project include Alameda Contra Costa Transit District (AC Transit), Amtrak, and Bay Area Rapid Transit (BART). AC Transit operates the following routes in the vicinity of the project:

- Line 51B has stops along University Avenue east of Sixth Street utilized by all 51B buses, approximately 0.5 miles northeast of the project. Every other 51B bus also has stops along University Avenue east of Fourth Street, approximately 0.3 miles north of the project.
- Lines 72 and 72M have stops along San Pablo Avenue north of Bancroft Way, approximately 0.5 miles east of the project.
- Line 36 has stops south and east of the Dwight Way/Seventh Street/Dwight Crescent intersection, approximately 0.5 miles southeast of the project.

[15] Based on FHWA guidelines documented by *Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations: Final Report and Recommended Guidelines (2005)*.

- Prior to the COVID-19 pandemic, Lines 80 and Z had stops along Sixth Street north and south of Allston Way, approximately 0.3 miles northeast of the project.

The Berkeley Amtrak Station is about 0.3 miles northwest of the project, and the North Berkeley BART Station is about 1.3 miles northeast of the project.

The West Berkeley Shuttle provides service between various destinations in West Berkeley and the Ashby BART Station. The nearest shuttle stop is on Dwight Way at Sixth Street, about 0.3 miles southeast of the project site.

As shown in Table 9, the project is estimated to generate about 18 AM peak hour and 18 PM peak hour transit trips. It is expected that most of these trips would use AC Transit buses, with some trips using BART or Amtrak. Considering the transit service in the project vicinity, the expected increase in transit ridership is not expected to have a noticeable effect on ridership.

6.6 Emergency Vehicle Access

Emergency vehicle access to the project site would be provided from Bancroft Way, Fifth Street, and Fourth Street. The project would not modify the existing roadway network. The streets surrounding the project site would all accommodate fire apparatuses.

The nearest fire station to the project site is Berkeley Fire Station #1 at 2442 Eighth Street, about 0.4 miles southeast of the project site. Although general traffic congestion may delay emergency vehicle response during peak commute times, response times are expected to remain less than five minutes.

6.7 Parking

6.7.1 Automobile Parking

Automobile parking for the project would be provided by the 415-space project parking garage, the 97-space surface parking lot at 787 Bancroft Way, and the 13-space surface parking lot on Fifth Street. In total, the project would be served by 525 parking spaces, which would be shared by employees and visitors of all components of the project.

City of Berkeley Municipal Code requirements for the Multi-Use Light-Industrial (MU-LI) and Mixed-Use Residential zoning districts apply to the project site. MU-LI zoning (Section 23E.80.080) requires one automobile parking space per 1,500 square feet of floor area for manufacturing uses with 10,000 square feet or greater, one automobile parking space per 1,000 square feet for manufacturing uses less than 10,000 square feet, and two automobile parking spaces per 1,000 square feet of floor area for non-residential uses not identified in the Code. MU-R zoning (Section 23E.84.080) requires one automobile parking space per 1,000 square feet of manufacturing uses.

Table 14 presents the off-street automobile parking requirements for the proposed project. The project is required to provide a minimum of 368 automobile parking spaces. The project would provide 525 off-street parking spaces, meeting code requirements.

Accessible Parking

The California Building Code requires accessible parking spaces to be provided when parking is provided for new buildings. The project would provide the following accessible parking spaces:

- The parking garage would provide 10 accessible parking spaces, including three van accessible spaces, which is consistent with requirements for parking facilities with between 400 and 500 parking spaces.
- The surface parking lot at 787 Bancroft Way would provide five accessible parking spaces, including one van accessible space, which is consistent with requirements for parking facilities with between 100 and 150 parking spaces.
- The surface parking lot on 5th Street would provide one van accessible parking space, which is consistent with requirements for parking facilities with between one and 25 parking spaces.

All accessible parking spaces would be located on the shortest accessible route to an accessible entrance and are arranged so that people with disabilities are not forced to wheel or walk behind parked vehicles other than their own.

Electric Vehicle Parking

The City of Berkeley Municipal Code (Section 19.37.040) requires parking facilities where ten or more parking spaces are constructed to provide 10 percent of the spaces with Level 2 electric vehicle (EV) charging stations and 40 percent of the spaces supplied with raceways. The parking garage would provide 42 EV charging stations, and the surface parking lot at 787 Bancroft Way would provide 11 EV charging stations, each of which represents at least 10 percent of the total parking spaces provided in those facilities. At least 166 parking spaces at the parking garage and 39 spaces at the surface parking lot at 787 Bancroft Way would provide raceways upon completion, which corresponds to at least 40 percent of the parking supply at each parking facility. The surface parking lot on Fifth Street does not require EV charging stations or raceways because it is an existing facility.

Table 14: Automobile Parking Requirements

Address	Land Use	Size[1]	Required Spaces per KSF[1]	Required Parking Spaces
Parking Requirements				
2246 Fifth Street – Tenant B	Light Manufacturing (MU-R)	12.5 KSF	1:1 KSF	13
2246 Fifth Street – Tenant A	Light Manufacturing (MU-LI)	17.4 KSF	1:1.5 KSF	12
2229 Fourth Street	Light Manufacturing (MU-LI)	19.9 KSF	1:1.5 KSF	13
2222 Fifth Street	Light Manufacturing (MU-R)	17.9 KSF	1:1 KSF	18
2233 Fourth Street	Light Manufacturing (MU-LI)	7.0 KSF	1:1 KSF	7
787 Bancroft Way	Light Manufacturing (MU-LI) Office/R&D (MU-LI)	33.3 KSF 125.8 KSF	1:1.5 KSF 2:1 KSF	274
716 Allston Way	Light Manufacturing (MU-LI) Office/R&D (MU-LI)	23.6 KSF 7.9 KSF	1:1.5 KSF 2:1 KSF	31
			Total Automobile Spaces Required	**368**
Parking supply				
			Fifth Street Surface Parking Lot	13
			Parking Garage	415
			787 Bancroft Way Surface Parking Lot	97
			Total Automobile Spaces Provided	**525**
			Automobile Parking Requirements Met?	**Yes**

Notes:
1. KSF = 1,000 square feet

Source: Fehr & Peers, 2021.

On-Street Parking and Passenger Loading

Along the project frontages, Fourth Street, Fifth Street, Bancroft Way, and Allston Way currently provide unrestricted on-street parking. Existing curb cuts that would be eliminated by the project include:

- Two curb cuts on the north side of Bancroft Way along the 787 Bancroft Way frontage
- Seven curb cuts on the west side of Fourth Street along the 787 Bancroft Way frontage
- Two curb cuts on the east side of Fourth Street along the parking garage frontage and proposed curb extensions
- Three curb cuts on the west side of Fifth Street along the frontage of the renovated buildings and proposed parking garage

The project would include two curb cuts on Bancroft Way along the 787 Bancroft Way frontage, and the parking garage would include two curb cuts on Fourth Street and one curb cut on Fifth Street. Two existing

curb cuts along the Fourth Street frontage would be retained, and two existing curb cuts on Fifth Street would be retained, including one to provide access to the 13-space surface parking lot.

On Fourth Street, curb extensions would be provided for approximately 170 feet on the east side and approximately 185 feet on the west side. The project proposes to modify curb use designations in the following ways:

- On the north side of Bancroft Way, the project proposes about 85 feet of new red curb and 42 feet of yellow curb for commercial loading between the parking lot and loading driveways on Bancroft Way.
- On the south side of Bancroft Way, the project proposes about 15 feet of new red curb opposite the surface parking lot driveway.
- On the west side of Fourth Street, the project proposes about 70 feet of white curb for passenger loading and unloading adjacent to the 787 Bancroft Way building lobby.
- On the east side of Fourth Street, the project proposes about 70 feet of new red curb and to remove about 20 feet of yellow curb.
- On the west side of Fifth Street, the project proposes about 40 feet of new red curb and to remove about 90 feet of yellow curb.

Overall, the project would result in the net reduction of about 20 on-street parking spaces.

6.7.2 Bicycle Parking

The City of Berkeley Municipal Code Section 23E.28.070 requires one bicycle parking space per 2,000 square feet of new floor area or expansion of existing non-residential buildings. The project would provide about 12,100 square feet of new non-residential floor area as part of the renovation of existing buildings in Phase 1, about 159,100 square feet of new non-residential floor area as part of the development of 787 Bancroft Way in Phase 3, and about 5,100 square feet of new non-residential floor area as part of the renovation of 716 Allston Way.

Table 15 presents the bicycle parking requirements for the proposed project. The project is required to provide six bicycle parking spaces in Phase 1, and 80 bicycle parking spaces in Phase 3, and three bicycle parking spaces with the renovation of 716 Allston Way. The project would provide six bicycle parking spaces in Phase 1, 80 bicycle parking spaces in Phase 3, and four bicycle parking spaces with the renovation of 716 Allston Way, meeting code requirements.

Table 15: Project Bicycle Parking Requirements

Address	New Floor Area[1]	Required Space per KSF[1]	Required Parking Spaces
Phase 1			
2246 Fifth Street	0.2 KSF	1:2 KSF	0
2229 Fourth Street	5.7 KSF	1:2 KSF	3
2222 Fifth Street	6.2 KSF	1:2 KSF	3
		Total Bicycle Parking Required	**6**
		Total Bicycle Parking Spaces Provided	**6**
		Phase 1 Bicycle Parking Requirement Met?	**Yes**
Phase 3			
787 Bancroft Way	159.1 KSF	1:2 KSF	80
		Total Bicycle Parking Required	**80**
		Total Bicycle Parking Spaces Provided	**80**
		Phase 3 Bicycle Parking Requirement Met?	**Yes**
Renovation of 716 Allston Way (Separate AUP Application)			
716 Allston Way	5.1 KSF	1:2 KSF	3
		Total Bicycle Parking Required	**3**
		Total Bicycle Parking Spaces Provided	**4**
		716 Allston Way Renovation Bicycle Parking Requirement Met?	**Yes**

Notes:
1. KSF = 1,000 square feet.

Source: Fehr & Peers, 2021.

The *City of Berkeley Bicycle Plan* provides guidelines on amount of long-term and short-term bicycle parking for development projects. Long-term bicycle parking includes lockers or locked enclosures, and short-term bicycle parking includes bicycle racks. The Bicycle Plan does not specify bicycle parking requirements for office/R&D uses, so the guidelines for office uses were applied instead. For office uses, the Bicycle Plan recommends one long-term bicycle parking space per 2,500 square feet of space and one short-term bicycle space per 10,000 square feet of space. For manufacturing uses, the Bicycle Plan recommends one long-term bicycle parking space per 30,000 square feet of space and no short-term spaces.

Table 16 summarizes the bicycle parking guidelines for the project based on the Bicycle Plan. The bicycle parking guidelines are to provide a minimum of 57 long-term bicycle parking spaces and a minimum of 13 short-term bicycle parking spaces.

Table 16: Bicycle Plan Bicycle Parking Guidelines

Land Use	Size[1]	Long-Term		Short-Term	
		Spaces Per Unit[2]	Spaces	Spaces Per Unit[2]	Spaces
Light Manufacturing	131.7 KSF	1:30 KSF	4	-	-
Office/R&D	133.7 KSF	1:2.5 KSF	53	1:10 KSF	13
		Total Bicycle Spaces Guidelines	***57***		***13***
		Total Bicycle Spaces Provided	***68***		***22***
		Bicycle Parking Guidelines Met?	***Yes***		***Yes***

Notes:
1. KSF = 1,000 square feet
2. Based on City of Berkeley Bicycle Plan, Appendix F.

Source: Fehr & Peers, 2021.

The project would provide 68 long-term bicycle parking spaces in a secure bicycle storage area in the 787 Bancroft Way development on Bancroft Way adjacent to the parking lot driveway. The project would provide showers and lockers in 787 Bancroft Way available for use by project employees.

The City of Berkeley Bicycle Plan specifies that short-term bicycle parking should be located within 50 feet of a main building entrance and be visible from the public right-of-way. The project would provide six short-term bicycle parking spaces next to main building entrances of the buildings renovated in Phase 1, 12 short-term bicycle parking spaces in front of the building lobby of 787 Bancroft Way on Fourth Street, and four short-term bicycle parking spaces on Fourth Street near the main building entrance for 716 Allston Way.

6.8 Summary of Modifications in the Public Right-of-Way

The following improvements in the public right-of-way, which shall be completed prior to occupancy, are proposed as part of the project to improve access and circulation in the project vicinity:

1. Installation of curb extensions on Fourth Street, extending for approximately 170 feet on the east side and 185 feet on the west side.
2. Installation of an uncontrolled midblock marked crosswalk on Fourth Street, approximately 225 feet north of Bancroft Way, to connect the parking garage and buildings on the east side of the street and the main lobby entrance for 787 Bancroft Way. The crosswalk would include pedestrian safety measures, including high-visibility crosswalk markings, nighttime pedestrian-scale lighting, and advanced "Yield Here to Pedestrians" signs and yield lines.
3. Installation of marked crosswalks on all four approaches of the Bancroft Way/Fourth Street and Allston Way/Fourth Street intersections and the provision of curb ramps with truncated domes at all four corners of the Allston Way/Fourth Street intersection.
4. Elimination of existing curb cuts at the following locations:
    - Two curb cuts on the north side of Bancroft Way along the 787 Bancroft Way frontage

- Four curb cuts on the west side of Fourth Street along the 787 Bancroft Way frontage
- Six curb cuts on the east side of Fourth Street along the parking garage frontage and proposed curb extensions
- Five curb cuts on the west side of Fifth Street along the frontage of the renovated buildings and proposed parking garage

5. Installation of new curb cuts at the following locations to provide access to the parking garages and surface parking lot:
   - Two curb cuts on Bancroft Way along the 787 Bancroft Way frontage
   - Two curb cuts on Fourth Street and one curb cut on Fifth Street
6. Modified curb use designations at the following locations:
   - On the north side of Bancroft Way, the project proposes about 85 feet of new red curb and 42 feet of yellow curb for commercial loading between the parking lot and loading driveways on Bancroft Way.
   - On the south side of Bancroft Way, the project proposes about 15 feet of new red curb opposite the surface parking lot driveway.
   - On the west side of Fourth Street, the project proposes about 70 feet of white curb for passenger loading and unloading adjacent to the 787 Bancroft Way building lobby.
   - On the east side of Fourth Street, the project proposes about 70 feet of new red curb and to remove about 20 feet of yellow curb.
   - On the west side of Fifth Street, the project proposes about 40 feet of new red curb and to remove about 90 feet of yellow curb.
7. The 600 Addison Street project is conditioned to improve the existing at-grade railroad crossing on Bancroft Way. However, if this at-grade crossing has not been improved prior to the occupancy of 787 Bancroft Way, the proposed project shall coordinate with UPRR, CPUC, and the City of Berkeley to improve the safety of all travelers at the at-grade railroad crossing. Potential improvements, which will be consistent with the Federal Railroad Administration requirements, may include:
   - Improve the automatic gate and warning devices at the crossing
   - Improve the sidewalk on the north side of Bancroft Way, including across the railroad tracks, to meet ADA requirements.

Appendix A
Streetlight Data Intersection Volumes

Prepared by National Data & Surveying Services

6th St & University Ave

Peak Hour Turning Movement Count

ID: 19-08592-012
City: Berkeley

Day: Tuesday
Date: 11/19/2019

PEAK HOURS	
AM	08:00 AM - 09:00 AM
NOON	NONE
PM	04:45 PM - 05:45 PM

COUNT PERIODS	
AM	07:00 AM - 09:30 AM
NOON	NONE
PM	04:00 PM - 06:30 PM

SOUTHBOUND (6th St)

AM	320	336	96	0	212	AM
NOON	0	0	0	0	0	NOON
PM	373	207	77	0	520	PM
	1	1	1	0		

EASTBOUND (University Ave)

AM	NOON	PM	
1287	0	1688	
1	0	2	0
48	0	88	1
780	0	758	2
284	0	190	0
AM	NOON	PM	

WESTBOUND (University Ave)

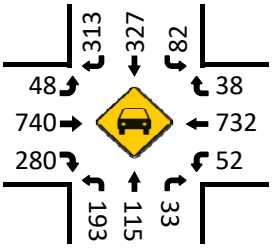
PM	NOON	AM	
46	0	40	1
973	0	767	2
26	0	54	1
1	0	1	0
873	0	915	
PM	NOON	AM	

NORTHBOUND (6th St)

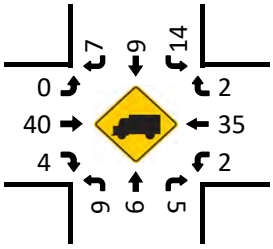
	0	1	1	1		
PM	423	0	340	386	37	PM
NOON	0	0	0	0	0	NOON
AM	674	0	199	124	38	AM

CONTROL			
Signalized			
TEV	3088	0	3504
	AM	NOON	PM
PHF	0.96		0.99

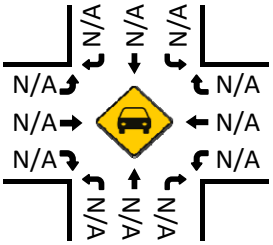
Cars (AM)



HT (AM)



Cars (NOON)



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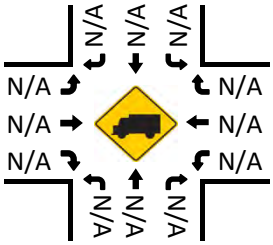
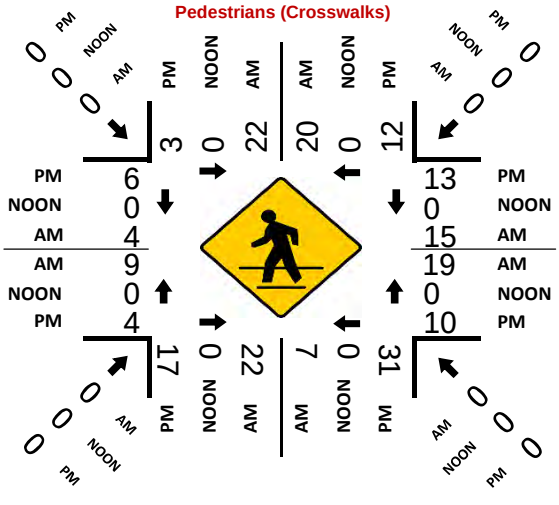


Pedestrians (Crosswalks)



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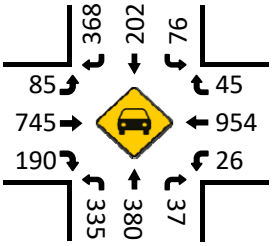

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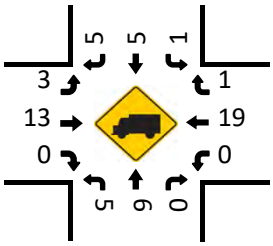


Prepared by National Data & Surveying Services

Fourth St & Bancroft Way

Peak Hour Turning Movement Count

ID: 19-08592-010
City: Berkeley

Day: Tuesday
Date: 11/19/2019

	PEAK HOURS	COUNT PERIODS
AM	08:15 AM - 09:15 AM	07:00 AM - 09:30 AM
NOON	NONE	NONE
PM	04:45 PM - 05:45 PM	04:00 PM - 06:30 PM

Fourth St – SOUTHBOUND

	Right	Thru	Left	U-Turn	Exiting
AM	9	112	35	0	54
NOON	0	0	0	0	0
PM	3	50	18	0	243
(red)	0	1	0	0	

Bancroft Way – EASTBOUND

	AM	NOON	PM	(red)
Exiting	29	0	27	
U-Turn	0	0	0	0
Left	7	0	21	0
Thru	16	0	25	1
Right	4	0	6	0

Bancroft Way – WESTBOUND

	(red)	PM	NOON	AM
Right	0	70	0	18
Thru	1	15	0	14
Left	0	9	0	8
U-Turn	0	0	0	1
Exiting		55	0	53

Fourth St – NORTHBOUND

	Exiting	U-Turn	Left	Thru	Right
(red)		0	0	1	0
PM	65	0	9	152	12
NOON	0	0	0	0	0
AM	124	0	6	29	1

CONTROL

4-Way Stop

	AM	NOON	PM
TEV	260	0	390
PHF	0.88		0.79

Cars (AM)

Approach	Left	Thru	Right
SB	35	109	9
EB	6	15	4
WB	8	13	16
NB	9	29	1

HT (AM)

Approach	Left	Thru	Right
SB	0	3	0
EB	1	1	0
WB	0	1	2
NB	0	0	0

Cars (NOON)

Approach	Left	Thru	Right
SB	N/A	N/A	N/A
EB	N/A	N/A	N/A
WB	N/A	N/A	N/A
NB	N/A	N/A	N/A

HT (NOON)

Approach	Left	Thru	Right
SB	N/A	N/A	N/A
EB	N/A	N/A	N/A
WB	N/A	N/A	N/A
NB	N/A	N/A	N/A

Cars (PM)

Approach	Left	Thru	Right
SB	17	48	3
EB	21	25	6
WB	9	15	69
NB	9	146	11

HT (PM)

Approach	Left	Thru	Right
SB	1	2	0
EB	0	0	0
WB	0	0	1
NB	0	9	1

Pedestrians (Crosswalks)

Crosswalk	Direction	AM	NOON	PM
North	Eastbound	3	0	2
North	Westbound	2	0	0
West	Southbound	3	0	2
West	Northbound	0	0	7
East	Southbound	5	0	2
East	Northbound	1	0	5
South	Eastbound	8	0	18
South	Westbound	14	0	4

Corner (diagonal)	AM	NOON	PM
NW	0	0	0
NE	0	0	0
SW	0	0	0
SE	0	0	0

Prepared by National Data & Surveying Services

6th St & Bancroft Way

Peak Hour Turning Movement Count

ID: 19-08592-013
City: Berkeley

Day: Tuesday
Date: 11/19/2019

PEAK HOURS	COUNT PERIODS
08:15 AM - 09:15 AM	07:00 AM - 09:30 AM
NONE	NONE
05:30 PM - 06:30 PM	04:00 PM - 06:30 PM

SOUTHBOUND (6th St)

AM	43	518	16	4	276	AM
NOON	0	0	0	0	0	NOON
PM	17	349	8	0	772	PM

EASTBOUND (Bancroft Way)

AM	NOON	PM	
74	0	77	⇦
1	0	0	↶ 0
13	0	14	↱ 0
3	0	2	→ 1
28	0	48	↴ 0
AM	NOON	PM	

WESTBOUND (Bancroft Way)

PM	NOON	AM	
16	0	6	↰ 0
2	0	1	← 1
2	0	0	↰ 0
0	0	0	↰ 0
20	0	21	⇨
PM	NOON	AM	

NORTHBOUND (6th St)

PM	399	0	58	742	10	PM
NOON	0	0	0	0	0	NOON
AM	546	0	29	253	2	AM

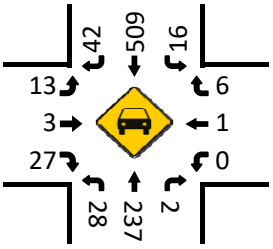
	0	1	0	0
	0	0	1	0

CONTROL

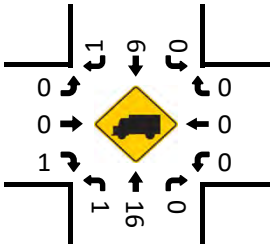
2-Way Stop (EB/WB)

TEV	917	0	1268
	AM	NOON	PM
PHF	0.94		0.98

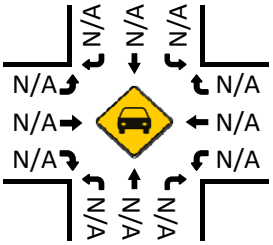
Cars (AM)



HT (AM)



Cars (NOON)



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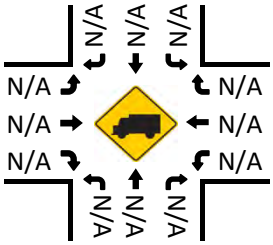
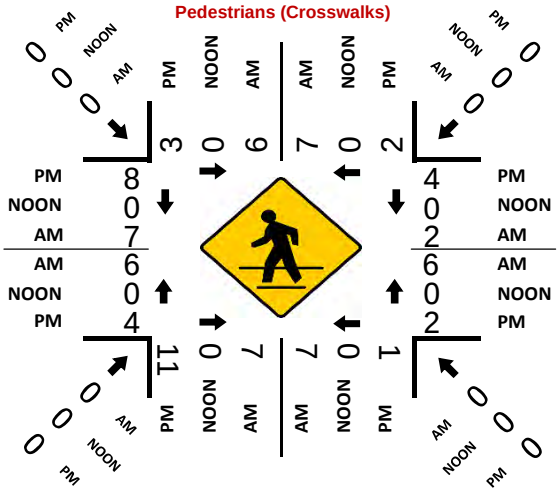
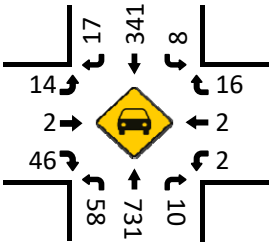


Pedestrians (Crosswalks)



Cars (PM)



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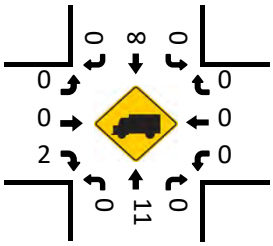


ALL TRAFFIC DATA

City of Berkeley
All Vehicles & Uturns On Unshifted
Peds & Bikes On Bank 1
Nothing On Bank 2

(916) 771-8700
orders@atdtraffic.com

File Name : 16-7669-001 6th St & Allston Way
Date : 9/27/2016

Unshifted Count = All Vehicles & Uturns

	6th St Southbound					Allston Way Westbound					6th St Northbound					Allston Way 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
7:00	0	61	3	0	64	0	2	2	0	4	0	27	0	0	27	4	3	1	0	8	103	0
7:15	4	77	5	0	86	2	2	3	0	7	0	31	3	0	34	1	3	0	0	4	131	0
7:30	11	91	5	0	107	4	1	6	0	11	2	43	2	0	47	8	0	2	0	10	175	0
7:45	8	115	1	0	124	2	4	7	0	13	3	51	2	0	56	5	3	3	0	11	204	0
Total	23	344	14	0	381	8	9	18	0	35	5	152	7	0	164	18	9	6	0	33	613	0
8:00	19	125	5	0	149	2	4	5	0	11	5	59	2	0	66	10	8	6	0	24	250	0
8:15	13	121	12	0	146	8	7	10	0	25	5	48	4	0	57	10	7	4	0	21	249	0
8:30	17	109	12	0	138	15	1	8	0	24	3	63	6	0	72	7	9	5	0	21	255	0
8:45	22	121	7	0	150	6	3	18	0	27	2	50	4	0	56	7	15	7	0	29	262	0
Total	71	476	36	0	583	31	15	41	0	87	15	220	16	0	251	34	39	22	0	95	1016	0
16:00	12	64	5	0	81	3	4	13	0	20	11	138	9	0	158	29	8	6	0	43	302	0
16:15	9	67	2	0	78	1	8	9	0	18	3	128	4	0	135	14	6	2	0	22	253	0
16:30	7	90	4	0	101	5	8	5	0	18	8	162	4	0	174	22	6	5	0	33	326	0
16:45	6	82	4	0	92	1	6	12	0	19	4	131	8	0	143	14	9	2	0	25	279	0
Total	34	303	15	0	352	10	26	39	0	75	26	559	25	0	610	79	29	15	0	123	1160	0
17:00	8	78	5	0	91	7	5	9	0	21	9	133	11	0	153	30	9	6	0	45	310	0
17:15	12	62	1	0	75	6	7	14	0	27	12	178	14	0	204	17	8	5	0	30	336	0
17:30	8	103	2	0	113	5	10	8	0	23	2	163	10	0	175	23	4	5	0	32	343	0
17:45	10	64	3	1	78	2	7	15	0	24	8	164	3	0	175	12	6	7	0	25	302	1
Total	38	307	11	1	357	20	29	46	0	95	31	638	38	0	707	82	27	23	0	132	1291	1
Grand Total	166	1430	76	1	1673	69	79	144	0	292	77	1569	86	0	1732	213	104	66	0	383	4080	1
Apprch %	9.9%	85.5%	4.5%	0.1%		23.6%	27.1%	49.3%	0.0%		4.4%	90.6%	5.0%	0.0%		55.6%	27.2%	17.2%	0.0%			
Total %	4.1%	35.0%	1.9%	0.0%	41.0%	1.7%	1.9%	3.5%	0.0%	7.2%	1.9%	38.5%	2.1%	0.0%	42.5%	5.2%	2.5%	1.6%	0.0%	9.4%	100.0%	

AM PEAK HOUR	6th St Southbound					Allston Way Westbound					6th St Northbound					Allston Way 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	19	125	5	0	149	2	4	5	0	11	5	59	2	0	66	10	8	6	0	24	250
8:15	13	121	12	0	146	8	7	10	0	25	5	48	4	0	57	10	7	4	0	21	249
8:30	17	109	12	0	138	15	1	8	0	24	3	63	6	0	72	7	9	5	0	21	255
8:45	22	121	7	0	150	6	3	18	0	27	2	50	4	0	56	7	15	7	0	29	262
Total Volume	71	476	36	0	583	31	15	41	0	87	15	220	16	0	251	34	39	22	0	95	1016
% App Total	12.2%	81.6%	6.2%	0.0%		35.6%	17.2%	47.1%	0.0%		6.0%	87.6%	6.4%	0.0%		35.8%	41.1%	23.2%	0.0%		
PHF	.807	.952	.750	.000	.972	.517	.536	.569	.000	.806	.750	.873	.667	.000	.872	.850	.650	.786	.000	.819	.969

PM PEAK HOUR	6th St Southbound					Allston Way Westbound					6th St Northbound					Allston Way 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	8	78	5	0	91	7	5	9	0	21	9	133	11	0	153	30	9	6	0	45	310
17:15	12	62	1	0	75	6	7	14	0	27	12	178	14	0	204	17	8	5	0	30	336
17:30	8	103	2	0	113	5	10	8	0	23	2	163	10	0	175	23	4	5	0	32	343
17:45	10	64	3	1	78	2	7	15	0	24	8	164	3	0	175	12	6	7	0	25	302
Total Volume	38	307	11	1	357	20	29	46	0	95	31	638	38	0	707	82	27	23	0	132	1291
% App Total	10.6%	86.0%	3.1%	0.3%		21.1%	30.5%	48.4%	0.0%		4.4%	90.2%	5.4%	0.0%		62.1%	20.5%	17.4%	0.0%		
PHF	.792	.745	.550	.250	.790	.714	.725	.767	.000	.880	.646	.896	.679	.000	.866	.683	.750	.821	.000	.733	.941

Allston Way & Fifth Street													
Day Type	Time	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			Total
		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
1: Weekday (Tu-Th)	01: 7:00am-7:15am	0	0	0	5	12	0	0	12	0	0	9	3	41
1: Weekday (Tu-Th)	02: 7:15am-7:30am	0	4	0	24	133	5	0	10	4	0	0	0	180
1: Weekday (Tu-Th)	03: 7:30am-7:45am	0	13	0	7	11	0	0	18	3	0	0	0	52
1: Weekday (Tu-Th)	04: 7:45am-8:00am	0	7	0	16	34	0	0	42	0	13	7	0	119
1: Weekday (Tu-Th)	05: 8:00am-8:15am	4	3	6	13	22	0	0	33	3	3	9	6	102
1: Weekday (Tu-Th)	06: 8:15am-8:30am	0	5	5	16	52	3	9	12	4	11	10	3	130
1: Weekday (Tu-Th)	07: 8:30am-8:45am	0	15	0	6	40	0	4	18	0	10	0	6	99
1: Weekday (Tu-Th)	08: 8:45am-9:00am	0	0	0	1	36	0	0	32	0	14	6	0	89
1: Weekday (Tu-Th)	09: 4:00pm-4:15pm	0	13	4	0	14	0	0	23	0	0	19	8	81
1: Weekday (Tu-Th)	10: 4:15pm-4:30pm	0	26	14	6	6	0	0	26	0	7	28	9	122
1: Weekday (Tu-Th)	11: 4:30pm-4:45pm	0	18	8	14	15	5	3	44	0	3	30	6	146
1: Weekday (Tu-Th)	12: 4:45pm-5:00pm	4	41	16	3	10	4	2	8	3	0	48	17	156
1: Weekday (Tu-Th)	13: 5:00pm-5:15pm	6	26	2	27	18	0	0	32	0	4	42	11	168
1: Weekday (Tu-Th)	14: 5:15pm-5:30pm	0	29	0	5	17	0	0	5	0	0	43	7	106
1: Weekday (Tu-Th)	15: 5:30pm-5:45pm	0	20	16	5	10	0	4	17	0	0	15	0	87
1: Weekday (Tu-Th)	16: 5:45pm-6:00pm	0	32	14	0	4	0	0	18	0	3	27	3	101
Peak Hour AM	8:00am -9:00am	4	30	11	51	148	3	13	105	7	37	26	15	450
Peak Hour PM	5:00pm - 6:00pm	10	107	32	37	49	0	4	72	0	7	127	21	462

Notes: Data collected by Streetlight for April and May 2019. AM and PM peak hours highlighted in green.

Bancroft Way & Fifth Street													
Day Type	Time	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			Total
		NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR	
1: Weekday (Tu-Th)	01: 7:00am-7:15am	0	0	0	3	10	0	0	29	0	7	2	0	51
1: Weekday (Tu-Th)	02: 7:15am-7:30am	0	4	0	29	118	0	0	34	3	7	2	3	200
1: Weekday (Tu-Th)	03: 7:30am-7:45am	5	7	0	9	14	0	0	40	0	2	0	0	77
1: Weekday (Tu-Th)	04: 7:45am-8:00am	0	0	0	12	21	3	6	50	0	5	10	0	107
1: Weekday (Tu-Th)	05: 8:00am-8:15am	0	12	0	16	12	0	0	55	0	5	13	0	113
1: Weekday (Tu-Th)	06: 8:15am-8:30am	5	8	5	16	43	5	0	43	16	10	20	0	171
1: Weekday (Tu-Th)	07: 8:30am-8:45am	0	24	7	3	25	0	0	48	7	2	14	0	130
1: Weekday (Tu-Th)	08: 8:45am-9:00am	0	3	2	34	12	0	0	46	13	0	8	3	121
1: Weekday (Tu-Th)	09: 4:00pm-4:15pm	0	28	10	0	13	0	3	34	0	0	31	3	122
1: Weekday (Tu-Th)	10: 4:15pm-4:30pm	4	23	0	0	10	0	3	34	0	2	48	12	136
1: Weekday (Tu-Th)	11: 4:30pm-4:45pm	0	17	0	0	13	5	0	43	0	0	42	3	123
1: Weekday (Tu-Th)	12: 4:45pm-5:00pm	0	50	3	5	17	0	5	38	2	0	17	9	146
1: Weekday (Tu-Th)	13: 5:00pm-5:15pm	5	17	11	0	4	0	0	46	0	0	29	5	117
1: Weekday (Tu-Th)	14: 5:15pm-5:30pm	9	12	5	3	28	3	0	72	0	2	25	8	167
1: Weekday (Tu-Th)	15: 5:30pm-5:45pm	0	32	0	0	10	4	0	56	0	0	32	3	137
1: Weekday (Tu-Th)	16: 5:45pm-6:00pm	5	43	0	0	8	3	0	41	3	9	20	0	132
Peak Hour AM	8:00am -9:00am	5	44	12	47	101	8	6	196	23	22	57	0	521
Peak Hour PM	5:00pm - 6:00pm	14	96	19	8	62	8	5	199	2	2	113	25	553

Notes: Data collected by Streetlight for April and May 2019. AM and PM peak hours highlighted in green.

Appendix B
Level of Service Calculation Sheets

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	49	780	284	55	767	40	199	124	38	96	336	320
Future Volume (veh/h)	49	780	284	55	767	40	199	124	38	96	336	320
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.93	1.00		0.96	0.96		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1731	1731	1800	1731	1731	1731	1731	1731	1731	1731	1731	1731
Adj Flow Rate, veh/h	51	812	275	57	799	9	207	129	20	100	350	266
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	238	1207	408	71	1335	554	242	626	510	303	387	522
Arrive On Green	0.14	0.51	0.51	0.04	0.41	0.41	0.11	0.36	0.36	0.22	0.22	0.22
Sat Flow, veh/h	1648	2379	805	1648	3288	1365	1648	1731	1409	1165	1731	1385
Grp Volume(v), veh/h	51	561	526	57	799	9	207	129	20	100	350	266
Grp Sat Flow(s),veh/h/ln	1648	1644	1540	1648	1644	1365	1648	1731	1409	1165	1731	1385
Q Serve(g_s), s	4.6	43.4	43.5	5.8	32.4	0.7	16.0	8.7	1.6	12.4	33.4	5.6
Cycle Q Clear(g_c), s	4.6	43.4	43.5	5.8	32.4	0.7	16.0	8.7	1.6	12.4	33.4	5.6
Prop In Lane	1.00		0.52	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	238	834	781	71	1335	554	242	626	510	303	387	522
V/C Ratio(X)	0.21	0.67	0.67	0.80	0.60	0.02	0.85	0.21	0.04	0.33	0.90	0.51
Avail Cap(c_a), veh/h	238	834	781	97	1335	554	296	764	622	358	468	587
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99	0.58	0.58	0.58
Uniform Delay (d), s/veh	64.2	31.3	31.4	80.6	39.6	30.2	46.3	37.4	35.1	56.0	64.2	21.7
Incr Delay (d2), s/veh	0.4	4.3	4.6	27.9	2.0	0.1	17.9	0.2	0.0	0.4	11.9	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	20.6	19.4	3.2	15.1	0.3	8.4	4.2	0.6	4.0	17.3	6.6
LnGrp Delay(d),s/veh	64.7	35.6	36.0	108.5	41.6	30.3	64.2	37.6	35.2	56.4	76.0	22.1
LnGrp LOS	E	D	D	F	D	C	E	D	D	E	E	C
Approach Vol, veh/h		1138			865			356			716	
Approach Delay, s/veh		37.1			45.9			52.9			53.3	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	12.3	91.2	23.4	43.1	29.5	74.0		66.5
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	10.0	70.0	24.0	46.0	11.0	69.0		75.0
Max Q Clear Time (g_c+I1), s	7.8	45.5	18.0	35.4	6.6	34.4		10.7
Green Ext Time (p_c), s	0.0	5.8	0.4	2.6	0.0	4.5		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	45.2
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	8.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	13	105	7	37	26	15	4	30	11	51	148	3
Future Vol, veh/h	13	105	7	37	26	15	4	30	11	51	148	3
Conflicting Peds, #/hr	6	0	15	15	0	6	14	0	9	9	0	14
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	15	121	8	43	30	17	5	34	13	59	170	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	53	0	0	144	0	0	395	309	149	319	305	59
Stage 1	-	-	-	-	-	-	170	170	-	131	131	-
Stage 2	-	-	-	-	-	-	225	139	-	188	174	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1546	-	-	1432	-	-	563	604	895	632	607	1004
Stage 1	-	-	-	-	-	-	830	756	-	870	786	-
Stage 2	-	-	-	-	-	-	775	780	-	811	753	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1538	-	-	1414	-	-	409	569	877	568	572	987
Mov Cap-2 Maneuver	-	-	-	-	-	-	409	569	-	568	572	-
Stage 1	-	-	-	-	-	-	811	739	-	856	758	-
Stage 2	-	-	-	-	-	-	574	752	-	748	736	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	3.6	11.6	15.4
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	600	1538	-	-	1414	-	-	575
HCM Lane V/C Ratio	0.086	0.01	-	-	0.03	-	-	0.404
HCM Control Delay (s)	11.6	7.4	0	-	7.6	0	-	15.4
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.3	0	-	-	0.1	-	-	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	39	22	31	15	41	15	220	16	71	476	36
Future Volume (veh/h)	34	39	22	31	15	41	15	220	16	71	476	36
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.96		0.94	0.96		0.91	1.00		0.96	0.99		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1748	1800	1800	1748	1800	1748	1748	1800	1748	1748	1800
Adj Flow Rate, veh/h	36	41	23	33	16	44	16	234	17	76	506	38
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	133	108	48	128	56	93	199	609	44	422	607	46
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.38	0.38	0.38	0.38	0.38	0.38
Sat Flow, veh/h	385	805	356	351	418	691	850	1604	117	1103	1600	120
Grp Volume(v), veh/h	100	0	0	93	0	0	16	0	251	76	0	544
Grp Sat Flow(s),veh/h/ln	1546	0	0	1460	0	0	850	0	1721	1103	0	1720
Q Serve(g_s), s	0.1	0.0	0.0	0.0	0.0	0.0	1.0	0.0	6.4	3.2	0.0	17.2
Cycle Q Clear(g_c), s	3.3	0.0	0.0	3.3	0.0	0.0	18.3	0.0	6.4	9.6	0.0	17.2
Prop In Lane	0.36		0.23	0.35		0.47	1.00		0.07	1.00		0.07
Lane Grp Cap(c), veh/h	289	0	0	277	0	0	199	0	653	422	0	653
V/C Ratio(X)	0.35	0.00	0.00	0.34	0.00	0.00	0.08	0.00	0.38	0.18	0.00	0.83
Avail Cap(c_a), veh/h	520	0	0	494	0	0	351	0	961	619	0	961
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.42	0.00	0.42
Uniform Delay (d), s/veh	23.9	0.0	0.0	23.9	0.0	0.0	25.2	0.0	13.5	17.0	0.0	16.9
Incr Delay (d2), s/veh	0.7	0.0	0.0	0.7	0.0	0.0	0.2	0.0	0.4	0.4	0.0	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	0.0	1.5	0.0	0.0	0.3	0.0	3.1	1.0	0.0	9.1
LnGrp Delay(d),s/veh	24.6	0.0	0.0	24.6	0.0	0.0	25.3	0.0	13.9	17.4	0.0	22.3
LnGrp LOS	C			C			C		B	B		C
Approach Vol, veh/h		100			93			267			620	
Approach Delay, s/veh		24.6			24.6			14.6			21.7	
Approach LOS		C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		12.6		27.3		12.6		27.3
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		17.5		33.5		17.5		33.5
Max Q Clear Time (g_c+I1), s		5.3		20.3		5.3		19.2
Green Ext Time (p_c), s		0.4		1.3		0.3		3.6

Intersection Summary	
HCM 2010 Ctrl Delay	20.5
HCM 2010 LOS	C

Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	9	1	6	13	14	4	25	0	39	107	11
Future Vol, veh/h	6	9	1	6	13	14	4	25	0	39	107	11
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	7	11	1	7	16	17	5	30	0	48	130	13
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.7	7.5	7.5	8.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	14%	38%	18%	25%
Vol Thru, %	86%	56%	39%	68%
Vol Right, %	0%	6%	42%	7%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	29	16	33	157
LT Vol	4	6	6	39
Through Vol	25	9	13	107
RT Vol	0	1	14	11
Lane Flow Rate	35	20	40	191
Geometry Grp	1	1	1	1
Degree of Util (X)	0.042	0.025	0.048	0.217
Departure Headway (Hd)	4.228	4.534	4.256	4.089
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	836	794	846	873
Service Time	2.309	2.536	2.257	2.137
HCM Lane V/C Ratio	0.042	0.025	0.047	0.219
HCM Control Delay	7.5	7.7	7.5	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.1	0.2	0.8

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	6	196	23	22	57	0	5	44	12	47	101	8
Future Vol, veh/h	6	196	23	22	57	0	5	44	12	47	101	8
Conflicting Peds, #/hr	6	0	15	15	0	6	4	0	6	6	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	76	76	76	76	76	76	76	76	76	76	76	76
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	8	258	30	29	75	0	7	58	16	62	133	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	81	0	0	303	0	0	513	443	294	471	458	85
Stage 1	-	-	-	-	-	-	304	304	-	139	139	-
Stage 2	-	-	-	-	-	-	209	139	-	332	319	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1510	-	-	1252	-	-	470	508	743	501	498	971
Stage 1	-	-	-	-	-	-	703	661	-	862	780	-
Stage 2	-	-	-	-	-	-	791	780	-	679	651	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1502	-	-	1236	-	-	351	485	730	431	475	963
Mov Cap-2 Maneuver	-	-	-	-	-	-	351	485	-	431	475	-
Stage 1	-	-	-	-	-	-	690	649	-	853	757	-
Stage 2	-	-	-	-	-	-	627	757	-	598	639	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	2.2	13.5	18.3
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	502	1502	-	-	1236	-	-	473
HCM Lane V/C Ratio	0.16	0.005	-	-	0.023	-	-	0.434
HCM Control Delay (s)	13.5	7.4	0	-	8	0	-	18.3
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.6	0	-	-	0.1	-	-	2.2

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	2	26	0	1	6	27	252	1	15	521	37
Future Vol, veh/h	10	2	26	0	1	6	27	252	1	15	521	37
Conflicting Peds, #/hr	6	0	15	15	0	6	14	0	9	9	0	14
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	11	2	28	0	1	7	29	274	1	16	566	40

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	975	974	615	990	994	290	620	0	0	284	0	0
Stage 1	632	632	-	342	342	-	-	-	-	-	-	-
Stage 2	343	342	-	648	652	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	230	251	489	224	244	747	956	-	-	1273	-	-
Stage 1	467	472	-	671	636	-	-	-	-	-	-	-
Stage 2	670	636	-	457	463	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	214	233	477	197	226	738	945	-	-	1263	-	-
Mov Cap-2 Maneuver	214	233	-	197	226	-	-	-	-	-	-	-
Stage 1	445	457	-	642	609	-	-	-	-	-	-	-
Stage 2	636	609	-	415	449	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.8	11.5	0.9	0.2
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	945	-	-	346	558	1263	-	-
HCM Lane V/C Ratio	0.031	-	-	0.119	0.014	0.013	-	-
HCM Control Delay (s)	8.9	0	-	16.8	11.5	7.9	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	758	190	27	973	46	340	386	37	77	207	373
Future Volume (veh/h)	90	758	190	27	973	46	340	386	37	77	207	373
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.96	0.99		0.97	0.98		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1765	1765	1800	1765	1765	1765	1765	1765	1765	1765	1765	1765
Adj Flow Rate, veh/h	91	766	172	27	983	14	343	390	18	78	209	312
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	279	1401	314	54	1301	557	398	659	541	201	293	485
Arrive On Green	0.17	0.52	0.52	0.03	0.39	0.39	0.18	0.37	0.37	0.17	0.17	0.17
Sat Flow, veh/h	1681	2682	602	1681	3353	1436	1681	1765	1450	951	1765	1417
Grp Volume(v), veh/h	91	479	459	27	983	14	343	390	18	78	209	312
Grp Sat Flow(s),veh/h/ln	1681	1676	1608	1681	1676	1436	1681	1765	1450	951	1765	1417
Q Serve(g_s), s	7.9	31.5	31.6	2.6	41.9	1.0	27.0	29.3	1.3	12.3	18.5	9.4
Cycle Q Clear(g_c), s	7.9	31.5	31.6	2.6	41.9	1.0	27.0	29.3	1.3	12.3	18.5	9.4
Prop In Lane	1.00		0.37	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	279	875	840	54	1301	557	398	659	541	201	293	485
V/C Ratio(X)	0.33	0.55	0.55	0.50	0.76	0.03	0.86	0.59	0.03	0.39	0.71	0.64
Avail Cap(c_a), veh/h	279	875	840	71	1301	557	406	791	651	268	417	584
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.80	0.80	0.80	0.87	0.87	0.87
Uniform Delay (d), s/veh	60.6	26.4	26.5	78.6	43.7	31.2	44.3	41.6	32.8	62.5	65.1	21.5
Incr Delay (d2), s/veh	0.7	2.5	2.6	7.1	4.1	0.1	13.9	0.7	0.0	1.1	2.8	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	15.2	14.7	1.3	20.1	0.4	14.0	14.4	0.5	3.3	9.3	7.4
LnGrp Delay(d),s/veh	61.3	28.8	29.1	85.7	47.9	31.3	58.3	42.3	32.8	63.6	67.9	23.0
LnGrp LOS	E	C	C	F	D	C	E	D	C	E	E	C
Approach Vol, veh/h		1029			1024			751			599	
Approach Delay, s/veh		31.8			48.6			49.4			44.0	
Approach LOS		C			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	9.3	90.2	34.2	31.4	31.4	68.0		65.6
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	6.0	71.0	30.0	38.0	14.0	63.0		73.0
Max Q Clear Time (g_c+I1), s	4.6	33.6	29.0	20.5	9.9	43.9		31.3
Green Ext Time (p_c), s	0.0	4.9	0.2	2.8	0.1	5.2		1.8

Intersection Summary	
HCM 2010 Ctrl Delay	42.9
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	5	89	3	7	163	41	10	114	26	49	60	9
Future Vol, veh/h	5	89	3	7	163	41	10	114	26	49	60	9
Conflicting Peds, #/hr	7	0	4	4	0	7	6	0	5	5	0	6
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	6	102	3	8	187	47	11	131	30	56	69	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	241	0	0	109	0	0	392	377	113	435	355	224
Stage 1	-	-	-	-	-	-	120	120	-	234	234	-
Stage 2	-	-	-	-	-	-	272	257	-	201	121	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1320	-	-	1475	-	-	566	553	937	530	569	813
Stage 1	-	-	-	-	-	-	882	794	-	767	709	-
Stage 2	-	-	-	-	-	-	732	693	-	799	794	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1312	-	-	1470	-	-	498	542	930	410	558	804
Mov Cap-2 Maneuver	-	-	-	-	-	-	498	542	-	410	558	-
Stage 1	-	-	-	-	-	-	875	788	-	759	700	-
Stage 2	-	-	-	-	-	-	644	685	-	639	788	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.2	13.8	15
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	581	1312	-	-	1470	-	-	495
HCM Lane V/C Ratio	0.297	0.004	-	-	0.005	-	-	0.274
HCM Control Delay (s)	13.8	7.8	0	-	7.5	0	-	15
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	1.2	0	-	-	0	-	-	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	27	23	20	29	46	31	638	38	39	307	11
Future Volume (veh/h)	82	27	23	20	29	46	31	638	38	39	307	11
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.92	0.98		0.94	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1748	1800	1800	1748	1800	1748	1748	1800	1748	1748	1800
Adj Flow Rate, veh/h	87	29	24	21	31	49	33	679	40	41	327	12
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	204	56	35	93	83	104	473	783	46	189	803	29
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.48	0.48	0.48	0.48	0.48	0.48
Sat Flow, veh/h	834	409	257	193	607	754	1025	1631	96	723	1673	61
Grp Volume(v), veh/h	140	0	0	101	0	0	33	0	719	41	0	339
Grp Sat Flow(s),veh/h/ln	1500	0	0	1554	0	0	1025	0	1727	723	0	1735
Q Serve(g_s), s	1.6	0.0	0.0	0.0	0.0	0.0	1.4	0.0	24.1	3.5	0.0	8.2
Cycle Q Clear(g_c), s	5.4	0.0	0.0	3.9	0.0	0.0	9.6	0.0	24.1	27.6	0.0	8.2
Prop In Lane	0.62		0.17	0.21		0.49	1.00		0.06	1.00		0.04
Lane Grp Cap(c), veh/h	296	0	0	281	0	0	473	0	829	189	0	832
V/C Ratio(X)	0.47	0.00	0.00	0.36	0.00	0.00	0.07	0.00	0.87	0.22	0.00	0.41
Avail Cap(c_a), veh/h	476	0	0	473	0	0	588	0	1023	271	0	1027
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.68	0.00	0.68
Uniform Delay (d), s/veh	26.4	0.0	0.0	25.9	0.0	0.0	14.0	0.0	15.1	27.4	0.0	10.9
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.8	0.0	0.0	0.1	0.0	6.8	1.8	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	0.0	1.7	0.0	0.0	0.4	0.0	13.0	0.8	0.0	4.1
LnGrp Delay(d),s/veh	27.6	0.0	0.0	26.6	0.0	0.0	14.1	0.0	21.9	29.1	0.0	11.9
LnGrp LOS	C			C			B		C	C		B
Approach Vol, veh/h		140			101			752			380	
Approach Delay, s/veh		27.6			26.6			21.5			13.8	
Approach LOS		C			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		13.4		35.7		13.4		35.7
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		17.5		38.5		17.5		38.5
Max Q Clear Time (g_c+I1), s		7.4		26.1		5.9		29.6
Green Ext Time (p_c), s		0.5		4.4		0.4		1.6

Intersection Summary	
HCM 2010 Ctrl Delay	20.4
HCM 2010 LOS	C

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	25	6	9	15	70	9	152	12	18	50	3
Future Vol, veh/h	21	25	6	9	15	70	9	152	12	18	50	3
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	27	32	8	11	19	89	11	192	15	23	63	4
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.3	8.1	9.1	8.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	40%	10%	25%
Vol Thru, %	88%	48%	16%	70%
Vol Right, %	7%	12%	74%	4%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	173	52	94	71
LT Vol	9	21	9	18
Through Vol	152	25	15	50
RT Vol	12	6	70	3
Lane Flow Rate	219	66	119	90
Geometry Grp	1	1	1	1
Degree of Util (X)	0.271	0.088	0.143	0.116
Departure Headway (Hd)	4.448	4.815	4.319	4.646
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	808	744	829	771
Service Time	2.474	2.847	2.348	2.677
HCM Lane V/C Ratio	0.271	0.089	0.144	0.117
HCM Control Delay	9.1	8.3	8.1	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.1	0.3	0.5	0.4

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	5	199	2	2	113	25	14	96	19	8	62	8
Future Vol, veh/h	5	199	2	2	113	25	14	96	19	8	62	8
Conflicting Peds, #/hr	2	0	22	22	0	2	9	0	7	7	0	9
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	76	76	76	76	76	76	76	76	76	76	76	76
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	7	262	3	3	149	33	18	126	25	11	82	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	184	0	0	287	0	0	527	490	293	534	475	177
Stage 1	-	-	-	-	-	-	300	300	-	174	174	-
Stage 2	-	-	-	-	-	-	227	190	-	360	301	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1385	-	-	1269	-	-	460	477	744	455	487	863
Stage 1	-	-	-	-	-	-	707	664	-	825	753	-
Stage 2	-	-	-	-	-	-	773	741	-	656	663	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1383	-	-	1246	-	-	381	463	726	342	473	855
Mov Cap-2 Maneuver	-	-	-	-	-	-	381	463	-	342	473	-
Stage 1	-	-	-	-	-	-	690	648	-	818	749	-
Stage 2	-	-	-	-	-	-	673	737	-	504	647	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.1	16.7	14.6
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	477	1383	-	-	1246	-	-	476
HCM Lane V/C Ratio	0.356	0.005	-	-	0.002	-	-	0.216
HCM Control Delay (s)	16.7	7.6	0	-	7.9	0	-	14.6
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.6	0	-	-	0	-	-	0.8

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	20	2	61	2	3	14	91	635	5	13	378	14
Future Vol, veh/h	20	2	61	2	3	14	91	635	5	13	378	14
Conflicting Peds, #/hr	6	0	18	18	0	6	11	0	5	5	0	11
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	21	2	63	2	3	14	94	655	5	13	390	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1294	1287	426	1325	1292	669	415	0	0	665	0	0
Stage 1	434	434	-	851	851	-	-	-	-	-	-	-
Stage 2	860	853	-	474	441	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	139	163	626	132	162	456	1139	-	-	919	-	-
Stage 1	598	579	-	353	375	-	-	-	-	-	-	-
Stage 2	349	374	-	569	575	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	116	137	611	102	136	452	1129	-	-	915	-	-
Mov Cap-2 Maneuver	116	137	-	102	136	-	-	-	-	-	-	-
Stage 1	514	563	-	305	324	-	-	-	-	-	-	-
Stage 2	289	324	-	492	559	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.6	19.8	1.1	0.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1129	-	-	289	262	915	-	-
HCM Lane V/C Ratio	0.083	-	-	0.296	0.075	0.015	-	-
HCM Control Delay (s)	8.5	0	-	22.6	19.8	9	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	1.2	0.2	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	790	311	55	824	96	220	128	39	108	381	347
Future Volume (veh/h)	55	790	311	55	824	96	220	128	39	108	381	347
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.93	1.00		0.96	0.97		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1731	1731	1800	1731	1731	1731	1731	1731	1731	1731	1731	1731
Adj Flow Rate, veh/h	57	823	303	57	858	67	229	133	21	112	397	294
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	170	1108	407	71	1373	571	246	677	552	333	433	500
Arrive On Green	0.10	0.48	0.48	0.04	0.42	0.42	0.11	0.39	0.39	0.25	0.25	0.25
Sat Flow, veh/h	1648	2319	852	1648	3288	1367	1648	1731	1413	1165	1731	1392
Grp Volume(v), veh/h	57	583	543	57	858	67	229	133	21	112	397	294
Grp Sat Flow(s),veh/h/ln	1648	1644	1527	1648	1644	1367	1648	1731	1413	1165	1731	1392
Q Serve(g_s), s	5.5	48.8	49.0	5.8	34.9	5.1	17.2	8.6	1.6	13.6	38.0	8.0
Cycle Q Clear(g_c), s	5.5	48.8	49.0	5.8	34.9	5.1	17.2	8.6	1.6	13.6	38.0	8.0
Prop In Lane	1.00		0.56	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	170	785	729	71	1373	571	246	677	552	333	433	500
V/C Ratio(X)	0.34	0.74	0.74	0.80	0.62	0.12	0.93	0.20	0.04	0.34	0.92	0.59
Avail Cap(c_a), veh/h	170	785	729	87	1373	571	246	733	598	371	489	545
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98	0.48	0.48	0.48
Uniform Delay (d), s/veh	70.8	35.9	36.0	80.6	39.0	30.3	44.4	34.1	32.0	52.9	62.1	24.4
Incr Delay (d2), s/veh	1.2	6.3	6.8	34.3	2.2	0.4	38.4	0.1	0.0	0.3	12.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	23.6	22.0	3.3	16.3	2.0	10.4	4.2	0.6	4.4	19.6	10.4
LnGrp Delay(d),s/veh	72.0	42.2	42.8	114.9	41.2	30.7	82.7	34.3	32.0	53.2	74.0	25.1
LnGrp LOS	E	D	D	F	D	C	F	C	C	D	E	C
Approach Vol, veh/h		1183			982			383			803	
Approach Delay, s/veh		43.9			44.7			63.1			53.2	
Approach LOS		D			D			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	12.3	86.2	24.0	47.5	22.5	76.0		71.5
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	9.0	74.0	19.0	48.0	12.0	71.0		72.0
Max Q Clear Time (g_c+I1), s	7.8	51.0	19.2	40.0	7.5	36.9		10.6
Green Ext Time (p_c), s	0.0	6.0	0.0	2.5	0.0	5.3		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	48.6
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	13	105	7	37	26	15	4	35	11	51	149	3
Future Vol, veh/h	13	105	7	37	26	15	4	35	11	51	149	3
Conflicting Peds, #/hr	6	0	15	15	0	6	14	0	9	9	0	14
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	15	121	8	43	30	17	5	40	13	59	171	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	53	0	0	144	0	0	396	309	149	322	305	59
Stage 1	-	-	-	-	-	-	170	170	-	131	131	-
Stage 2	-	-	-	-	-	-	226	139	-	191	174	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1546	-	-	1432	-	-	562	604	895	629	607	1004
Stage 1	-	-	-	-	-	-	830	756	-	870	786	-
Stage 2	-	-	-	-	-	-	774	780	-	808	753	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1538	-	-	1414	-	-	407	569	877	561	572	987
Mov Cap-2 Maneuver	-	-	-	-	-	-	407	569	-	561	572	-
Stage 1	-	-	-	-	-	-	811	739	-	856	758	-
Stage 2	-	-	-	-	-	-	572	752	-	739	736	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	3.6	11.7	15.5
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	596	1538	-	-	1414	-	-	573
HCM Lane V/C Ratio	0.096	0.01	-	-	0.03	-	-	0.407
HCM Control Delay (s)	11.7	7.4	0	-	7.6	0	-	15.5
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.3	0	-	-	0.1	-	-	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	39	22	31	15	41	15	273	16	71	583	36
Future Volume (veh/h)	34	39	22	31	15	41	15	273	16	71	583	36
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.96		0.94	0.96		0.91	1.00		0.96	0.99		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1748	1800	1800	1748	1800	1748	1748	1800	1748	1748	1800
Adj Flow Rate, veh/h	36	41	23	33	16	44	16	290	17	76	620	38
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	133	108	48	128	56	93	195	721	42	458	719	44
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.44	0.44	0.44	0.44	0.44	0.44
Sat Flow, veh/h	385	805	356	351	418	691	765	1630	96	1051	1626	100
Grp Volume(v), veh/h	100	0	0	93	0	0	16	0	307	76	0	658
Grp Sat Flow(s),veh/h/ln	1546	0	0	1460	0	0	765	0	1726	1051	0	1725
Q Serve(g_s), s	0.1	0.0	0.0	0.0	0.0	0.0	1.2	0.0	7.2	3.2	0.0	20.6
Cycle Q Clear(g_c), s	3.3	0.0	0.0	3.3	0.0	0.0	21.8	0.0	7.2	10.4	0.0	20.6
Prop In Lane	0.36		0.23	0.35		0.47	1.00		0.06	1.00		0.06
Lane Grp Cap(c), veh/h	289	0	0	277	0	0	195	0	763	458	0	763
V/C Ratio(X)	0.35	0.00	0.00	0.34	0.00	0.00	0.08	0.00	0.40	0.17	0.00	0.86
Avail Cap(c_a), veh/h	510	0	0	485	0	0	289	0	975	587	0	975
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.36	0.00	0.36
Uniform Delay (d), s/veh	23.9	0.0	0.0	23.9	0.0	0.0	24.9	0.0	11.4	14.9	0.0	15.1
Incr Delay (d2), s/veh	0.7	0.0	0.0	0.7	0.0	0.0	0.2	0.0	0.3	0.3	0.0	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	0.0	1.5	0.0	0.0	0.3	0.0	3.5	0.9	0.0	10.7
LnGrp Delay(d),s/veh	24.6	0.0	0.0	24.6	0.0	0.0	25.1	0.0	11.7	15.2	0.0	20.0
LnGrp LOS	C			C			C		B	B		C
Approach Vol, veh/h		100			93			323			734	
Approach Delay, s/veh		24.6			24.6			12.4			19.5	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		12.5		31.0		12.5		31.0
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		17.1		33.9		17.1		33.9
Max Q Clear Time (g_c+I1), s		5.3		23.8		5.3		22.6
Green Ext Time (p_c), s		0.3		1.4		0.3		3.9

Intersection Summary	
HCM 2010 Ctrl Delay	18.5
HCM 2010 LOS	B

Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	26	1	6	68	14	4	25	0	39	107	34
Future Vol, veh/h	15	26	1	6	68	14	4	25	0	39	107	34
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	18	32	1	7	83	17	5	30	0	48	130	41
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.1	8.2	7.8	8.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	14%	36%	7%	22%
Vol Thru, %	86%	62%	77%	59%
Vol Right, %	0%	2%	16%	19%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	29	42	88	180
LT Vol	4	15	6	39
Through Vol	25	26	68	107
RT Vol	0	1	14	34
Lane Flow Rate	35	51	107	220
Geometry Grp	1	1	1	1
Degree of Util (X)	0.045	0.067	0.134	0.262
Departure Headway (Hd)	4.591	4.712	4.509	4.297
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	782	762	796	839
Service Time	2.61	2.733	2.528	2.31
HCM Lane V/C Ratio	0.045	0.067	0.134	0.262
HCM Control Delay	7.8	8.1	8.2	8.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.2	0.5	1.1

Intersection	
Int Delay, s/veh	7.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	6	213	23	22	112	5	5	44	12	48	101	8
Future Vol, veh/h	6	213	23	22	112	5	5	44	12	48	101	8
Conflicting Peds, #/hr	6	0	15	15	0	6	4	0	6	6	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	76	76	76	76	76	76	76	76	76	76	76	76
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	8	280	30	29	147	7	7	58	16	63	133	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	160	0	0	325	0	0	611	544	316	569	556	161
Stage 1	-	-	-	-	-	-	326	326	-	215	215	-
Stage 2	-	-	-	-	-	-	285	218	-	354	341	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1413	-	-	1229	-	-	404	445	722	431	438	881
Stage 1	-	-	-	-	-	-	684	647	-	785	723	-
Stage 2	-	-	-	-	-	-	720	721	-	661	637	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1406	-	-	1214	-	-	289	423	709	364	417	874
Mov Cap-2 Maneuver	-	-	-	-	-	-	289	423	-	364	417	-
Stage 1	-	-	-	-	-	-	671	635	-	776	701	-
Stage 2	-	-	-	-	-	-	560	699	-	580	625	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.3	15	22.4
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	441	1406	-	-	1214	-	-	410
HCM Lane V/C Ratio	0.182	0.006	-	-	0.024	-	-	0.504
HCM Control Delay (s)	15	7.6	0	-	8	0	-	22.4
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.7	0	-	-	0.1	-	-	2.7

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	23	2	31	0	1	6	59	292	1	15	600	65
Future Vol, veh/h	23	2	31	0	1	6	59	292	1	15	600	65
Conflicting Peds, #/hr	6	0	15	15	0	6	14	0	9	9	0	14
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	25	2	34	0	1	7	64	317	1	16	652	71

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1190	1189	717	1208	1224	333	737	0	0	327	0	0
Stage 1	734	734	-	455	455	-	-	-	-	-	-	-
Stage 2	456	455	-	753	769	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	164	187	428	159	178	706	864	-	-	1227	-	-
Stage 1	410	424	-	583	567	-	-	-	-	-	-	-
Stage 2	582	567	-	400	409	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	145	163	418	130	155	697	854	-	-	1218	-	-
Mov Cap-2 Maneuver	145	163	-	130	155	-	-	-	-	-	-	-
Stage 1	368	410	-	526	512	-	-	-	-	-	-	-
Stage 2	520	512	-	353	395	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26.3	12.9	1.6	0.2
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	854	-	-	229	465	1218	-	-
HCM Lane V/C Ratio	0.075	-	-	0.266	0.016	0.013	-	-
HCM Control Delay (s)	9.6	0	-	26.3	12.9	8	0	-
HCM Lane LOS	A	A	-	D	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	1	0.1	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	810	195	27	999	49	469	409	40	85	218	457
Future Volume (veh/h)	94	810	195	27	999	49	469	409	40	85	218	457
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.96	0.99		0.97	0.98		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1765	1765	1800	1765	1765	1765	1765	1765	1765	1765	1765	1765
Adj Flow Rate, veh/h	95	818	177	27	1009	17	474	413	21	86	220	397
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	255	1290	279	54	1199	512	461	738	608	201	299	468
Arrive On Green	0.15	0.48	0.47	0.03	0.36	0.36	0.22	0.42	0.42	0.17	0.17	0.17
Sat Flow, veh/h	1681	2701	584	1681	3353	1433	1681	1765	1454	929	1765	1418
Grp Volume(v), veh/h	95	508	487	27	1009	17	474	413	21	86	220	397
Grp Sat Flow(s),veh/h/ln	1681	1676	1609	1681	1676	1433	1681	1765	1454	929	1765	1418
Q Serve(g_s), s	8.4	37.4	37.5	2.6	45.6	1.3	37.0	29.3	1.4	14.0	19.5	15.5
Cycle Q Clear(g_c), s	8.4	37.4	37.5	2.6	45.6	1.3	37.0	29.3	1.4	14.0	19.5	15.5
Prop In Lane	1.00		0.36	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	255	800	768	54	1199	512	461	738	608	201	299	468
V/C Ratio(X)	0.37	0.63	0.63	0.50	0.84	0.03	1.03	0.56	0.03	0.43	0.74	0.85
Avail Cap(c_a), veh/h	255	800	768	71	1199	512	461	866	714	269	428	572
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.65	0.65	0.65	0.80	0.80	0.80
Uniform Delay (d), s/veh	62.9	32.3	32.5	78.6	48.7	34.5	42.5	36.5	28.4	62.7	65.0	22.6
Incr Delay (d2), s/veh	0.9	3.8	4.0	7.1	7.2	0.1	41.0	0.4	0.0	1.2	3.1	8.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	18.2	17.5	1.3	22.4	0.5	26.3	14.4	0.6	3.6	9.8	10.2
LnGrp Delay(d),s/veh	63.8	36.1	36.4	85.7	55.9	34.6	83.5	36.9	28.4	63.9	68.1	30.6
LnGrp LOS	E	D	D	F	E	C	F	D	C	E	E	C
Approach Vol, veh/h		1090			1053			908			703	
Approach Delay, s/veh		38.7			56.4			61.0			46.4	
Approach LOS		D			E			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	9.3	82.8	41.0	32.0	29.0	63.0		73.0
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	6.0	64.0	36.0	39.0	12.0	58.0		80.0
Max Q Clear Time (g_c+I1), s	4.6	39.5	39.0	21.5	10.4	47.6		31.3
Green Ext Time (p_c), s	0.0	5.0	0.0	3.4	0.0	4.0		2.0

Intersection Summary	
HCM 2010 Ctrl Delay	50.5
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	5	89	3	7	163	41	10	115	26	49	65	9
Future Vol, veh/h	5	89	3	7	163	41	10	115	26	49	65	9
Conflicting Peds, #/hr	7	0	4	4	0	7	6	0	5	5	0	6
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	6	102	3	8	187	47	11	132	30	56	75	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	241	0	0	109	0	0	395	377	113	436	355	224
Stage 1	-	-	-	-	-	-	120	120	-	234	234	-
Stage 2	-	-	-	-	-	-	275	257	-	202	121	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1320	-	-	1475	-	-	563	553	937	529	569	813
Stage 1	-	-	-	-	-	-	882	794	-	767	709	-
Stage 2	-	-	-	-	-	-	729	693	-	798	794	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1312	-	-	1470	-	-	490	542	930	408	558	804
Mov Cap-2 Maneuver	-	-	-	-	-	-	490	542	-	408	558	-
Stage 1	-	-	-	-	-	-	875	788	-	759	700	-
Stage 2	-	-	-	-	-	-	636	685	-	637	788	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.2	13.8	15.1
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	580	1312	-	-	1470	-	-	496
HCM Lane V/C Ratio	0.299	0.004	-	-	0.005	-	-	0.285
HCM Control Delay (s)	13.8	7.8	0	-	7.5	0	-	15.1
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	1.2	0	-	-	0	-	-	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	27	23	20	29	46	31	798	38	39	348	11
Future Volume (veh/h)	82	27	23	20	29	46	31	798	38	39	348	11
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.92	0.98		0.94	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1748	1800	1800	1748	1800	1748	1748	1800	1748	1748	1800
Adj Flow Rate, veh/h	87	29	24	21	31	49	33	849	40	41	370	12
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	204	56	35	93	83	104	546	933	44	175	949	31
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.56	0.56	0.56	0.56	0.56	0.56
Sat Flow, veh/h	834	409	257	193	607	754	986	1653	78	617	1682	55
Grp Volume(v), veh/h	140	0	0	101	0	0	33	0	889	41	0	382
Grp Sat Flow(s),veh/h/ln	1500	0	0	1554	0	0	986	0	1731	617	0	1736
Q Serve(g_s), s	1.6	0.0	0.0	0.0	0.0	0.0	1.3	0.0	29.9	4.1	0.0	8.0
Cycle Q Clear(g_c), s	5.4	0.0	0.0	3.9	0.0	0.0	9.2	0.0	29.9	34.0	0.0	8.0
Prop In Lane	0.62		0.17	0.21		0.49	1.00		0.04	1.00		0.03
Lane Grp Cap(c), veh/h	296	0	0	281	0	0	546	0	977	175	0	980
V/C Ratio(X)	0.47	0.00	0.00	0.36	0.00	0.00	0.06	0.00	0.91	0.23	0.00	0.39
Avail Cap(c_a), veh/h	476	0	0	473	0	0	574	0	1025	193	0	1028
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.81	0.00	0.81
Uniform Delay (d), s/veh	26.4	0.0	0.0	25.9	0.0	0.0	10.5	0.0	12.7	27.9	0.0	7.9
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.8	0.0	0.0	0.0	0.0	11.4	2.5	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	0.0	1.7	0.0	0.0	0.3	0.0	17.2	0.8	0.0	4.1
LnGrp Delay(d),s/veh	27.6	0.0	0.0	26.6	0.0	0.0	10.5	0.0	24.1	30.4	0.0	8.8
LnGrp LOS	C			C			B		C	C		A
Approach Vol, veh/h		140			101			922			423	
Approach Delay, s/veh		27.6			26.6			23.6			10.9	
Approach LOS		C			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		13.4		41.2		13.4		41.2
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		17.5		38.5		17.5		38.5
Max Q Clear Time (g_c+I1), s		7.4		31.9		5.9		36.0
Green Ext Time (p_c), s		0.5		3.7		0.4		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	20.8
HCM 2010 LOS	C

Intersection	
Intersection Delay, s/veh	10.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	72	132	6	9	25	70	9	152	12	18	50	8
Future Vol, veh/h	72	132	6	9	25	70	9	152	12	18	50	8
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	91	167	8	11	32	89	11	192	15	23	63	10
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.9	8.8	10.3	9.1
HCM LOS	B	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	34%	9%	24%
Vol Thru, %	88%	63%	24%	66%
Vol Right, %	7%	3%	67%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	173	210	104	76
LT Vol	9	72	9	18
Through Vol	152	132	25	50
RT Vol	12	6	70	8
Lane Flow Rate	219	266	132	96
Geometry Grp	1	1	1	1
Degree of Util (X)	0.305	0.366	0.172	0.139
Departure Headway (Hd)	5.008	4.953	4.706	5.197
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	712	720	753	682
Service Time	3.088	3.028	2.792	3.291
HCM Lane V/C Ratio	0.308	0.369	0.175	0.141
HCM Control Delay	10.3	10.9	8.8	9.1
HCM Lane LOS	B	B	A	A
HCM 95th-tile Q	1.3	1.7	0.6	0.5

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	5	306	2	2	123	26	14	96	19	13	62	8
Future Vol, veh/h	5	306	2	2	123	26	14	96	19	13	62	8
Conflicting Peds, #/hr	2	0	22	22	0	2	9	0	7	7	0	9
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	76	76	76	76	76	76	76	76	76	76	76	76
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	7	403	3	3	162	34	18	126	25	17	82	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	198	0	0	428	0	0	682	645	434	688	629	190
Stage 1	-	-	-	-	-	-	441	441	-	187	187	-
Stage 2	-	-	-	-	-	-	241	204	-	501	442	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1369	-	-	1126	-	-	363	390	620	359	398	849
Stage 1	-	-	-	-	-	-	593	575	-	812	743	-
Stage 2	-	-	-	-	-	-	760	731	-	550	575	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1367	-	-	1105	-	-	290	378	605	251	386	841
Mov Cap-2 Maneuver	-	-	-	-	-	-	290	378	-	251	386	-
Stage 1	-	-	-	-	-	-	578	561	-	805	739	-
Stage 2	-	-	-	-	-	-	661	727	-	403	561	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	21.4	18.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	387	1367	-	-	1105	-	-	374
HCM Lane V/C Ratio	0.439	0.005	-	-	0.002	-	-	0.292
HCM Control Delay (s)	21.4	7.6	0	-	8.3	0	-	18.5
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	2.2	0	-	-	0	-	-	1.2

Intersection	
Int Delay, s/veh	33.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	100	2	93	2	3	14	97	715	5	13	414	19
Future Vol, veh/h	100	2	93	2	3	14	97	715	5	13	414	19
Conflicting Peds, #/hr	6	0	18	18	0	6	11	0	5	5	0	11
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	103	2	96	2	3	14	100	737	5	13	427	20

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1428	1421	466	1475	1429	751	458	0	0	747	0	0
Stage 1	474	474	-	945	945	-	-	-	-	-	-	-
Stage 2	954	947	-	530	484	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	112	136	595	104	134	409	1098	-	-	857	-	-
Stage 1	569	556	-	313	339	-	-	-	-	-	-	-
Stage 2	310	338	-	531	550	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 90	111	581	73	109	405	1088	-	-	853	-	-
Mov Cap-2 Maneuver	~ 90	111	-	73	109	-	-	-	-	-	-	-
Stage 1	475	540	-	263	285	-	-	-	-	-	-	-
Stage 2	248	284	-	426	534	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	244.2	23.7	1	0.3
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1088	-	-	151	212	853	-	-
HCM Lane V/C Ratio	0.092	-	-	1.331	0.092	0.016	-	-
HCM Control Delay (s)	8.6	0	-	244.2	23.7	9.3	0	-
HCM Lane LOS	A	A	-	F	C	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	12.4	0.3	0	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	796	355	63	851	96	231	129	39	108	386	347
Future Volume (veh/h)	55	796	355	63	851	96	231	129	39	108	386	347
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.93	1.00		0.96	0.97		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1731	1731	1800	1731	1731	1731	1731	1731	1731	1731	1731	1731
Adj Flow Rate, veh/h	57	829	349	66	886	67	241	134	21	112	402	294
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	4	4	4	4	4	4	4	4	4	4	4	4
Cap, veh/h	150	1033	433	81	1393	579	253	687	561	333	433	482
Arrive On Green	0.09	0.47	0.47	0.05	0.42	0.42	0.12	0.40	0.40	0.25	0.25	0.25
Sat Flow, veh/h	1648	2221	931	1648	3288	1368	1648	1731	1413	1164	1731	1392
Grp Volume(v), veh/h	57	613	565	66	886	67	241	134	21	112	402	294
Grp Sat Flow(s),veh/h/ln	1648	1644	1507	1648	1644	1368	1648	1731	1413	1164	1731	1392
Q Serve(g_s), s	5.5	54.0	54.5	6.7	36.1	5.0	18.5	8.6	1.5	13.6	38.6	10.7
Cycle Q Clear(g_c), s	5.5	54.0	54.5	6.7	36.1	5.0	18.5	8.6	1.5	13.6	38.6	10.7
Prop In Lane	1.00		0.62	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	150	765	701	81	1393	579	253	687	561	333	433	482
V/C Ratio(X)	0.38	0.80	0.81	0.81	0.64	0.12	0.95	0.19	0.04	0.34	0.93	0.61
Avail Cap(c_a), veh/h	150	765	701	97	1393	579	253	723	590	357	468	511
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98	0.48	0.48	0.48
Uniform Delay (d), s/veh	72.7	38.7	38.9	80.0	38.7	29.7	46.0	33.5	31.4	52.9	62.3	26.9
Incr Delay (d2), s/veh	1.6	8.6	9.6	34.3	2.2	0.4	42.7	0.1	0.0	0.3	14.1	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	26.4	24.5	3.9	16.8	2.0	14.3	4.2	0.6	4.4	20.1	10.4
LnGrp Delay(d),s/veh	74.3	47.4	48.5	114.3	40.9	30.1	88.7	33.6	31.4	53.2	76.3	27.9
LnGrp LOS	E	D	D	F	D	C	F	C	C	D	E	C
Approach Vol, veh/h		1235			1019			396			808	
Approach Delay, s/veh		49.1			44.9			67.0			55.5	
Approach LOS		D			D			E			E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	13.4	84.1	25.0	47.5	20.5	77.0		72.5
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	10.0	74.0	20.0	46.0	12.0	72.0		71.0
Max Q Clear Time (g_c+I1), s	8.7	56.5	20.5	40.6	7.5	38.1		10.6
Green Ext Time (p_c), s	0.0	5.8	0.0	1.9	0.0	5.5		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	51.4
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	10.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	13	105	7	81	26	15	4	35	20	51	149	3
Future Vol, veh/h	13	105	7	81	26	15	4	35	20	51	149	3
Conflicting Peds, #/hr	6	0	15	15	0	6	14	0	9	9	0	14
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	15	121	8	93	30	17	5	40	23	59	171	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	53	0	0	144	0	0	496	409	149	427	405	59
Stage 1	-	-	-	-	-	-	170	170	-	231	231	-
Stage 2	-	-	-	-	-	-	326	239	-	196	174	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1546	-	-	1432	-	-	483	531	895	536	533	1004
Stage 1	-	-	-	-	-	-	830	756	-	770	711	-
Stage 2	-	-	-	-	-	-	684	706	-	803	753	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1538	-	-	1414	-	-	321	481	877	454	483	987
Mov Cap-2 Maneuver	-	-	-	-	-	-	321	481	-	454	483	-
Stage 1	-	-	-	-	-	-	811	739	-	758	659	-
Stage 2	-	-	-	-	-	-	465	654	-	726	736	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	5.1	12.5	19.4
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	546	1538	-	-	1414	-	-	479
HCM Lane V/C Ratio	0.124	0.01	-	-	0.066	-	-	0.487
HCM Control Delay (s)	12.5	7.4	0	-	7.7	0	-	19.4
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.4	0	-	-	0.2	-	-	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	39	22	31	15	41	15	276	16	71	596	80
Future Volume (veh/h)	43	39	22	31	15	41	15	276	16	71	596	80
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.96		0.95	0.96		0.92	1.00		0.96	0.99		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1748	1800	1800	1748	1800	1748	1748	1800	1748	1748	1800
Adj Flow Rate, veh/h	46	41	23	33	16	44	16	294	17	76	634	85
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	151	104	45	130	59	97	189	780	45	500	717	96
Arrive On Green	0.14	0.14	0.14	0.14	0.14	0.14	0.48	0.48	0.48	0.48	0.48	0.48
Sat Flow, veh/h	471	742	321	349	425	695	723	1632	94	1048	1502	201
Grp Volume(v), veh/h	110	0	0	93	0	0	16	0	311	76	0	719
Grp Sat Flow(s),veh/h/ln	1534	0	0	1470	0	0	723	0	1726	1048	0	1703
Q Serve(g_s), s	0.5	0.0	0.0	0.0	0.0	0.0	1.2	0.0	6.9	3.0	0.0	22.9
Cycle Q Clear(g_c), s	3.7	0.0	0.0	3.3	0.0	0.0	24.1	0.0	6.9	9.9	0.0	22.9
Prop In Lane	0.42		0.21	0.35		0.47	1.00		0.05	1.00		0.12
Lane Grp Cap(c), veh/h	299	0	0	287	0	0	189	0	825	500	0	813
V/C Ratio(X)	0.37	0.00	0.00	0.32	0.00	0.00	0.08	0.00	0.38	0.15	0.00	0.88
Avail Cap(c_a), veh/h	510	0	0	487	0	0	253	0	975	592	0	962
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.32	0.00	0.32
Uniform Delay (d), s/veh	23.8	0.0	0.0	23.6	0.0	0.0	25.1	0.0	10.0	13.1	0.0	14.2
Incr Delay (d2), s/veh	0.8	0.0	0.0	0.6	0.0	0.0	0.2	0.0	0.3	0.2	0.0	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	0.0	1.4	0.0	0.0	0.3	0.0	3.3	0.9	0.0	11.7
LnGrp Delay(d),s/veh	24.5	0.0	0.0	24.3	0.0	0.0	25.3	0.0	10.3	13.3	0.0	19.1
LnGrp LOS	C			C			C		B	B		B
Approach Vol, veh/h		110			93			327			795	
Approach Delay, s/veh		24.5			24.3			11.0			18.5	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		12.9		33.2		12.9		33.2
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		17.1		33.9		17.1		33.9
Max Q Clear Time (g_c+I1), s		5.7		26.1		5.3		24.9
Green Ext Time (p_c), s		0.4		1.2		0.3		3.8

Intersection Summary	
HCM 2010 Ctrl Delay	17.6
HCM 2010 LOS	B

Intersection	
Intersection Delay, s/veh	8.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	29	1	6	87	14	4	25	0	39	107	34
Future Vol, veh/h	17	29	1	6	87	14	4	25	0	39	107	34
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	21	35	1	7	106	17	5	30	0	48	130	41
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.2	8.5	7.9	9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	14%	36%	6%	22%
Vol Thru, %	86%	62%	81%	59%
Vol Right, %	0%	2%	13%	19%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	29	47	107	180
LT Vol	4	17	6	39
Through Vol	25	29	87	107
RT Vol	0	1	14	34
Lane Flow Rate	35	57	130	220
Geometry Grp	1	1	1	1
Degree of Util (X)	0.046	0.076	0.165	0.266
Departure Headway (Hd)	4.668	4.749	4.539	4.367
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	767	755	791	823
Service Time	2.695	2.776	2.561	2.388
HCM Lane V/C Ratio	0.046	0.075	0.164	0.267
HCM Control Delay	7.9	8.2	8.5	9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.2	0.6	1.1

Intersection	
Int Delay, s/veh	8.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	6	216	23	22	131	26	5	44	12	52	101	8
Future Vol, veh/h	6	216	23	22	131	26	5	44	12	52	101	8
Conflicting Peds, #/hr	6	0	15	15	0	6	4	0	6	6	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	76	76	76	76	76	76	76	76	76	76	76	76
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	8	284	30	29	172	34	7	58	16	68	133	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	212	0	0	329	0	0	653	600	320	611	598	199
Stage 1	-	-	-	-	-	-	330	330	-	253	253	-
Stage 2	-	-	-	-	-	-	323	270	-	358	345	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1352	-	-	1225	-	-	379	413	718	404	414	839
Stage 1	-	-	-	-	-	-	681	644	-	749	696	-
Stage 2	-	-	-	-	-	-	687	684	-	658	634	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1345	-	-	1210	-	-	265	392	705	338	393	832
Mov Cap-2 Maneuver	-	-	-	-	-	-	265	392	-	338	393	-
Stage 1	-	-	-	-	-	-	668	632	-	740	674	-
Stage 2	-	-	-	-	-	-	528	662	-	577	622	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1	15.8	25.4
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	412	1345	-	-	1210	-	-	383
HCM Lane V/C Ratio	0.195	0.006	-	-	0.024	-	-	0.553
HCM Control Delay (s)	15.8	7.7	0	-	8	0	-	25.4
HCM Lane LOS	C	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.7	0	-	-	0.1	-	-	3.2

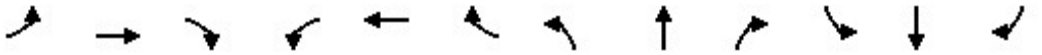
Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	26	2	35	0	1	6	86	292	1	15	600	78
Future Vol, veh/h	26	2	35	0	1	6	86	292	1	15	600	78
Conflicting Peds, #/hr	6	0	15	15	0	6	14	0	9	9	0	14
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	28	2	38	0	1	7	93	317	1	16	652	85

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1255	1254	724	1275	1296	333	751	0	0	327	0	0
Stage 1	741	741	-	513	513	-	-	-	-	-	-	-
Stage 2	514	513	-	762	783	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	148	171	424	143	161	706	854	-	-	1227	-	-
Stage 1	407	421	-	542	534	-	-	-	-	-	-	-
Stage 2	541	534	-	396	403	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	126	142	414	111	134	697	844	-	-	1218	-	-
Mov Cap-2 Maneuver	126	142	-	111	134	-	-	-	-	-	-	-
Stage 1	348	406	-	466	459	-	-	-	-	-	-	-
Stage 2	461	459	-	345	389	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30.8	13.4	2.2	0.2
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	844	-	-	207	436	1218	-	-
HCM Lane V/C Ratio	0.111	-	-	0.331	0.017	0.013	-	-
HCM Control Delay (s)	9.8	0	-	30.8	13.4	8	0	-
HCM Lane LOS	A	A	-	D	B	A	A	-
HCM 95th %tile Q(veh)	0.4	-	-	1.4	0.1	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	843	204	29	1005	49	541	415	40	85	219	457
Future Volume (veh/h)	94	843	204	29	1005	49	541	415	40	85	219	457
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.93	1.00		0.95	0.99		0.97	0.98		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1765	1765	1800	1765	1765	1765	1765	1765	1765	1765	1765	1765
Adj Flow Rate, veh/h	95	852	186	29	1015	17	546	419	21	86	221	397
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	215	1186	259	55	1158	495	522	801	661	200	299	432
Arrive On Green	0.13	0.44	0.43	0.03	0.35	0.35	0.26	0.45	0.45	0.17	0.17	0.17
Sat Flow, veh/h	1681	2694	588	1681	3353	1432	1681	1765	1456	924	1765	1418
Grp Volume(v), veh/h	95	530	508	29	1015	17	546	419	21	86	221	397
Grp Sat Flow(s),veh/h/ln	1681	1676	1605	1681	1676	1432	1681	1765	1456	924	1765	1418
Q Serve(g_s), s	8.6	42.7	42.8	2.8	46.9	1.3	43.0	28.0	1.3	14.1	19.6	18.4
Cycle Q Clear(g_c), s	8.6	42.7	42.8	2.8	46.9	1.3	43.0	28.0	1.3	14.1	19.6	18.4
Prop In Lane	1.00		0.37	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	215	738	707	55	1158	495	522	801	661	200	299	432
V/C Ratio(X)	0.44	0.72	0.72	0.53	0.88	0.03	1.05	0.52	0.03	0.43	0.74	0.92
Avail Cap(c_a), veh/h	215	738	707	71	1158	495	522	898	741	251	396	510
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.48	0.48	0.48	0.80	0.80	0.80
Uniform Delay (d), s/veh	66.5	37.8	38.0	78.5	50.7	35.8	42.5	32.2	25.0	62.8	65.1	24.3
Incr Delay (d2), s/veh	1.4	5.9	6.2	7.6	9.4	0.1	40.4	0.3	0.0	1.2	4.1	17.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	21.0	20.1	1.4	23.2	0.5	29.6	13.7	0.5	3.7	9.9	17.0
LnGrp Delay(d),s/veh	67.9	43.7	44.1	86.1	60.1	35.9	82.9	32.5	25.0	64.0	69.2	41.3
LnGrp LOS	E	D	D	F	E	D	F	C	C	E	E	D
Approach Vol, veh/h		1133			1061			986			704	
Approach Delay, s/veh		45.9			60.4			60.2			52.8	
Approach LOS		D			E			E			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6		8
Phs Duration (G+Y+Rc), s	9.4	76.7	47.0	31.9	25.1	61.0		78.9
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0		5.0
Max Green Setting (Gmax), s	6.0	61.0	42.0	36.0	11.0	56.0		83.0
Max Q Clear Time (g_c+I1), s	4.8	44.8	45.0	21.6	10.6	48.9		30.0
Green Ext Time (p_c), s	0.0	4.7	0.0	3.2	0.0	3.2		2.0

Intersection Summary	
HCM 2010 Ctrl Delay	54.8
HCM 2010 LOS	D

Intersection	
Int Delay, s/veh	8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	89	3	16	163	41	10	115	86	49	65	9
Future Vol, veh/h	5	89	3	16	163	41	10	115	86	49	65	9
Conflicting Peds, #/hr	7	0	4	4	0	7	6	0	5	5	0	6
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	6	102	3	18	187	47	11	132	99	56	75	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	241	0	0	109	0	0	415	397	113	490	375	224
Stage 1	-	-	-	-	-	-	120	120	-	254	254	-
Stage 2	-	-	-	-	-	-	295	277	-	236	121	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1320	-	-	1475	-	-	546	539	937	487	554	813
Stage 1	-	-	-	-	-	-	882	794	-	748	695	-
Stage 2	-	-	-	-	-	-	711	679	-	765	794	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1312	-	-	1470	-	-	471	524	930	342	538	804
Mov Cap-2 Maneuver	-	-	-	-	-	-	471	524	-	342	538	-
Stage 1	-	-	-	-	-	-	875	788	-	740	681	-
Stage 2	-	-	-	-	-	-	613	665	-	564	788	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.5	14.2	16.7
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	633	1312	-	-	1470	-	-	447
HCM Lane V/C Ratio	0.383	0.004	-	-	0.013	-	-	0.316
HCM Control Delay (s)	14.2	7.8	0	-	7.5	0	-	16.7
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	1.8	0	-	-	0	-	-	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	27	23	20	29	46	31	816	38	39	351	20
Future Volume (veh/h)	142	27	23	20	29	46	31	816	38	39	351	20
Number	5	2	12	1	6	16	7	4	14	3	8	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.93	0.99		0.95	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1748	1800	1800	1748	1800	1748	1748	1800	1748	1748	1800
Adj Flow Rate, veh/h	151	29	24	21	31	49	33	868	40	41	373	21
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	284	44	31	100	115	139	547	950	44	174	939	53
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.57	0.57	0.57	0.57	0.57	0.57
Sat Flow, veh/h	1034	242	170	180	634	767	975	1655	76	606	1636	92
Grp Volume(v), veh/h	204	0	0	101	0	0	33	0	908	41	0	394
Grp Sat Flow(s),veh/h/ln	1445	0	0	1581	0	0	975	0	1732	606	0	1728
Q Serve(g_s), s	4.8	0.0	0.0	0.0	0.0	0.0	1.3	0.0	30.6	4.2	0.0	8.2
Cycle Q Clear(g_c), s	8.5	0.0	0.0	3.7	0.0	0.0	9.4	0.0	30.6	34.8	0.0	8.2
Prop In Lane	0.74		0.12	0.21		0.49	1.00		0.04	1.00		0.05
Lane Grp Cap(c), veh/h	359	0	0	354	0	0	547	0	993	174	0	991
V/C Ratio(X)	0.57	0.00	0.00	0.29	0.00	0.00	0.06	0.00	0.91	0.24	0.00	0.40
Avail Cap(c_a), veh/h	477	0	0	483	0	0	566	0	1026	185	0	1024
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.79	0.00	0.79
Uniform Delay (d), s/veh	25.0	0.0	0.0	23.3	0.0	0.0	10.3	0.0	12.4	28.0	0.0	7.7
Incr Delay (d2), s/veh	1.4	0.0	0.0	0.4	0.0	0.0	0.0	0.0	12.1	2.5	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	0.0	1.6	0.0	0.0	0.3	0.0	17.7	0.8	0.0	4.1
LnGrp Delay(d),s/veh	26.5	0.0	0.0	23.7	0.0	0.0	10.3	0.0	24.5	30.5	0.0	8.6
LnGrp LOS	C			C			B		C	C		A
Approach Vol, veh/h		204			101			941			435	
Approach Delay, s/veh		26.5			23.7			24.0			10.7	
Approach LOS		C			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		16.3		41.8		16.3		41.8
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		17.5		38.5		17.5		38.5
Max Q Clear Time (g_c+I1), s		10.5		32.6		5.7		36.8
Green Ext Time (p_c), s		0.6		3.4		0.4		0.5

Intersection Summary	
HCM 2010 Ctrl Delay	20.8
HCM 2010 LOS	C

Intersection	
Intersection Delay, s/veh	10.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	80	156	6	9	28	70	9	152	12	18	50	8
Future Vol, veh/h	80	156	6	9	28	70	9	152	12	18	50	8
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	101	197	8	11	35	89	11	192	15	23	63	10
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.7	9	10.6	9.4
HCM LOS	B	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	33%	8%	24%
Vol Thru, %	88%	64%	26%	66%
Vol Right, %	7%	2%	65%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	173	242	107	76
LT Vol	9	80	9	18
Through Vol	152	156	28	50
RT Vol	12	6	70	8
Lane Flow Rate	219	306	135	96
Geometry Grp	1	1	1	1
Degree of Util (X)	0.318	0.423	0.184	0.145
Departure Headway (Hd)	5.226	5.077	4.884	5.43
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	692	714	737	663
Service Time	3.226	3.077	2.903	3.444
HCM Lane V/C Ratio	0.316	0.429	0.183	0.145
HCM Control Delay	10.6	11.7	9	9.4
HCM Lane LOS	B	B	A	A
HCM 95th-tile Q	1.4	2.1	0.7	0.5

Intersection	
Int Delay, s/veh	7.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	5	330	2	2	126	30	14	96	19	34	62	8
Future Vol, veh/h	5	330	2	2	126	30	14	96	19	34	62	8
Conflicting Peds, #/hr	2	0	22	22	0	2	9	0	7	7	0	9
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	76	76	76	76	76	76	76	76	76	76	76	76
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	7	434	3	3	166	39	18	126	25	45	82	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	207	0	0	459	0	0	719	685	465	726	667	197
Stage 1	-	-	-	-	-	-	472	472	-	194	194	-
Stage 2	-	-	-	-	-	-	247	213	-	532	473	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1358	-	-	1097	-	-	342	369	595	339	378	842
Stage 1	-	-	-	-	-	-	571	557	-	805	738	-
Stage 2	-	-	-	-	-	-	755	724	-	529	557	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1356	-	-	1077	-	-	271	358	581	232	367	834
Mov Cap-2 Maneuver	-	-	-	-	-	-	271	358	-	232	367	-
Stage 1	-	-	-	-	-	-	557	543	-	798	734	-
Stage 2	-	-	-	-	-	-	656	720	-	384	543	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.1	23.1	24.4
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	366	1356	-	-	1077	-	-	320
HCM Lane V/C Ratio	0.464	0.005	-	-	0.002	-	-	0.428
HCM Control Delay (s)	23.1	7.7	0	-	8.4	0	-	24.4
HCM Lane LOS	C	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	2.4	0	-	-	0	-	-	2.1

Intersection	
Int Delay, s/veh	57.2

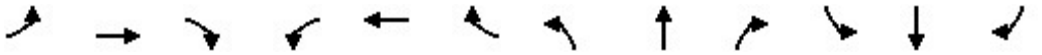
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	118	2	120	2	3	14	101	715	5	13	414	22
Future Vol, veh/h	118	2	120	2	3	14	101	715	5	13	414	22
Conflicting Peds, #/hr	6	0	18	18	0	6	11	0	5	5	0	11
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	122	2	124	2	3	14	104	737	5	13	427	23

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1438	1431	468	1499	1440	751	461	0	0	747	0	0
Stage 1	476	476	-	953	953	-	-	-	-	-	-	-
Stage 2	962	955	-	546	487	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	~ 110	134	593	100	132	409	1095	-	-	857	-	-
Stage 1	568	555	-	310	336	-	-	-	-	-	-	-
Stage 2	306	336	-	520	549	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 88	109	579	66	107	405	1085	-	-	853	-	-
Mov Cap-2 Maneuver	~ 88	109	-	66	107	-	-	-	-	-	-	-
Stage 1	471	539	-	259	280	-	-	-	-	-	-	-
Stage 2	243	280	-	393	533	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 358.2	24.4	1.1	0.3
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1085	-	-	153	205	853	-	-
HCM Lane V/C Ratio	0.096	-	-	1.617	0.096	0.016	-	-
HCM Control Delay (s)	8.7	0	-	$ 358.2	24.4	9.3	0	-
HCM Lane LOS	A	A	-	F	C	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	17.2	0.3	0	-	-

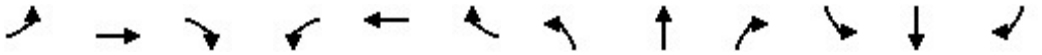
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	2	35	0	1	6	86	292	1	15	600	78
Future Volume (veh/h)	26	2	35	0	1	6	86	292	1	15	600	78
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.96		0.96	1.00		0.93	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1748	1800	1800	1748	1800	1800	1748	1800	1800	1748	1800
Adj Flow Rate, veh/h	28	2	38	0	1	7	93	317	1	16	652	85
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	159	36	140	0	31	218	247	790	2	70	1032	132
Arrive On Green	0.18	0.18	0.18	0.00	0.18	0.18	0.69	0.69	0.69	0.69	0.69	0.69
Sat Flow, veh/h	426	205	799	0	177	1241	252	1143	3	13	1493	192
Grp Volume(v), veh/h	68	0	0	0	0	8	411	0	0	753	0	0
Grp Sat Flow(s),veh/h/ln	1431	0	0	0	0	1419	1398	0	0	1698	0	0
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	2.3	0.0	0.0	0.0	0.0	0.3	5.7	0.0	0.0	14.6	0.0	0.0
Prop In Lane	0.41		0.56	0.00		0.87	0.23		0.00	0.02		0.11
Lane Grp Cap(c), veh/h	335	0	0	0	0	249	1040	0	0	1235	0	0
V/C Ratio(X)	0.20	0.00	0.00	0.00	0.00	0.03	0.40	0.00	0.00	0.61	0.00	0.00
Avail Cap(c_a), veh/h	601	0	0	0	0	520	1040	0	0	1235	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.00	0.00	1.00	0.97	0.00	0.00	0.42	0.00	0.00
Uniform Delay (d), s/veh	21.3	0.0	0.0	0.0	0.0	20.5	3.7	0.0	0.0	5.1	0.0	0.0
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.0	0.0	0.1	1.1	0.0	0.0	0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	0.0	0.0	0.1	3.1	0.0	0.0	7.0	0.0	0.0
LnGrp Delay(d),s/veh	21.6	0.0	0.0	0.0	0.0	20.6	4.8	0.0	0.0	6.1	0.0	0.0
LnGrp LOS	C					C	A			A		
Approach Vol, veh/h		68			8			411			753	
Approach Delay, s/veh		21.6			20.6			4.8			6.1	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		45.5		14.5		45.5		14.5
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0
Max Green Setting (Gmax), s		30.0		22.0		30.0		22.0
Max Q Clear Time (g_c+I1), s		7.7		4.3		16.6		2.3
Green Ext Time (p_c), s		3.3		0.3		4.8		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	6.6
HCM 2010 LOS	A



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	2	120	2	3	14	101	715	5	13	414	22
Future Volume (veh/h)	118	2	120	2	3	14	101	715	5	13	414	22
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.96		0.93	0.98		0.94	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1800	1765	1800	1800	1765	1800	1800	1765	1800	1800	1765	1800
Adj Flow Rate, veh/h	122	2	124	2	3	14	104	737	5	13	427	23
Adj No. of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	222	23	169	72	80	266	154	921	6	63	1020	54
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.63	0.63	0.63	0.63	0.63	0.63
Sat Flow, veh/h	601	95	697	61	331	1097	153	1464	10	16	1620	86
Grp Volume(v), veh/h	248	0	0	19	0	0	846	0	0	463	0	0
Grp Sat Flow(s),veh/h/ln	1393	0	0	1489	0	0	1627	0	0	1722	0	0
Q Serve(g_s), s	9.5	0.0	0.0	0.0	0.0	0.0	17.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	11.4	0.0	0.0	0.7	0.0	0.0	27.3	0.0	0.0	9.4	0.0	0.0
Prop In Lane	0.49		0.50	0.11		0.74	0.12		0.01	0.03		0.05
Lane Grp Cap(c), veh/h	414	0	0	417	0	0	1081	0	0	1137	0	0
V/C Ratio(X)	0.60	0.00	0.00	0.05	0.00	0.00	0.78	0.00	0.00	0.41	0.00	0.00
Avail Cap(c_a), veh/h	680	0	0	695	0	0	1081	0	0	1137	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	0.35	0.00	0.00	0.79	0.00	0.00
Uniform Delay (d), s/veh	24.3	0.0	0.0	20.4	0.0	0.0	9.6	0.0	0.0	6.5	0.0	0.0
Incr Delay (d2), s/veh	1.4	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	0.0	0.3	0.0	0.0	12.8	0.0	0.0	4.8	0.0	0.0
LnGrp Delay(d),s/veh	25.7	0.0	0.0	20.4	0.0	0.0	11.7	0.0	0.0	7.4	0.0	0.0
LnGrp LOS	C			C			B			A		
Approach Vol, veh/h		248			19			846			463	
Approach Delay, s/veh		25.7			20.4			11.7			7.4	
Approach LOS		C			C			B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		48.6		21.4		48.6		21.4
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		30.5		30.5		30.5		30.5
Max Q Clear Time (g_c+I1), s		29.3		13.4		11.4		2.7
Green Ext Time (p_c), s		0.7		1.5		3.1		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	12.7
HCM 2010 LOS	B

Appendix C
Signal Warrant Calculation Sheets

FEHR PEERS

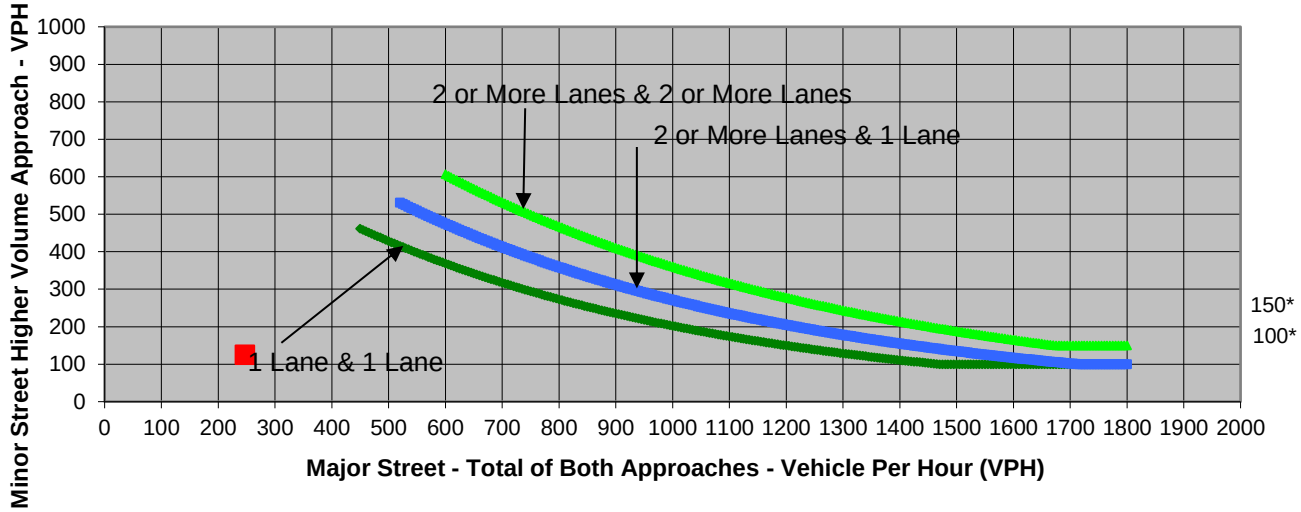
Major Street	Fifth St	Project	TheLabs
Minor Street	Allston Way	Scenario	Existing No Project
		Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	4	51	13	37
Through	30	148	105	26
Right	11	3	7	15
Total	45	202	125	78

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Fifth St	Allston Way	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**247**	**125**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

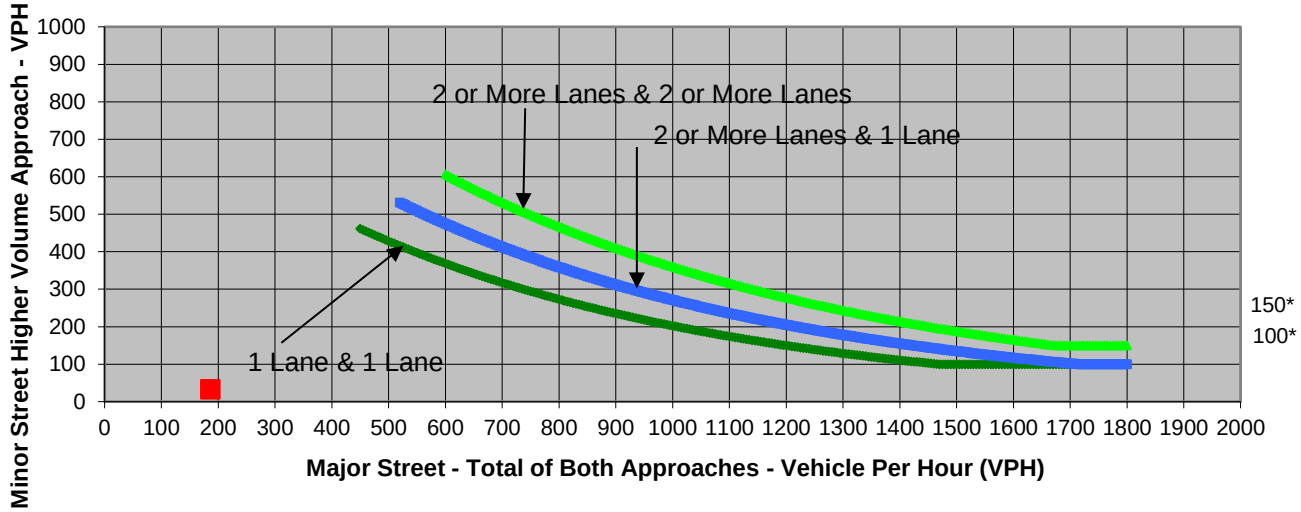
Major Street	Fourth St	Project	TheLabs
Minor Street	Bancroft Way	Scenario	Existing No Project
		Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	4	39	6	6
Through	25	107	9	13
Right	0	11	1	14
Total	29	157	16	33

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Fourth St	Bancroft Way	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**186**	**33**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

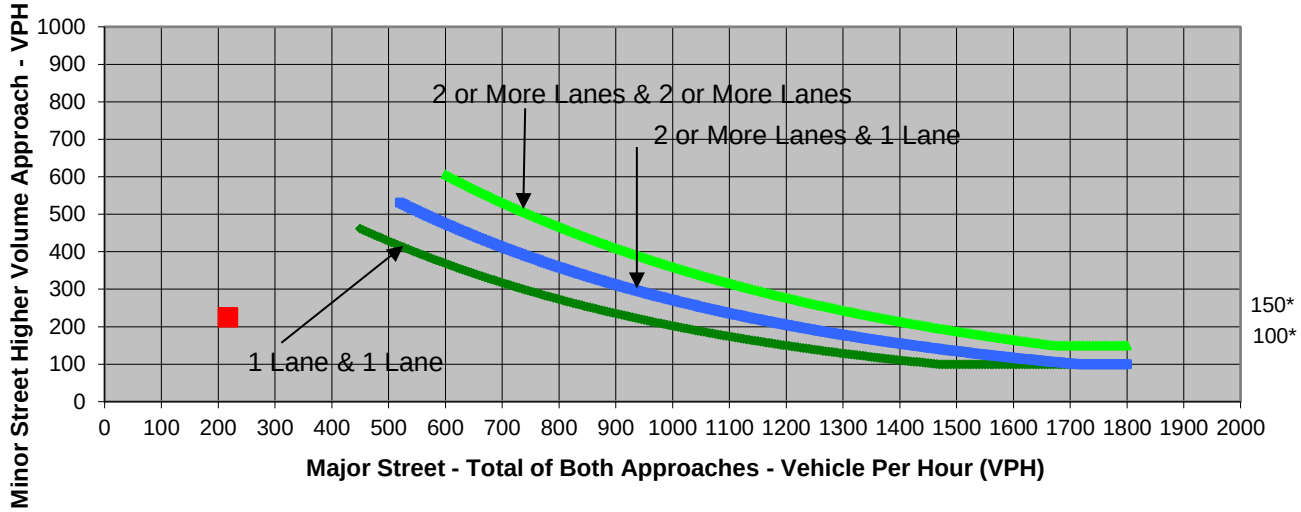
Major Street	Fifth St	Project	TheLabs
Minor Street	Bancroft Way	Scenario	Existing No Project
		Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	5	47	6	22
Through	44	101	196	57
Right	12	8	23	0
Total	61	156	225	79

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Fifth St	Bancroft Way	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**217**	**225**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

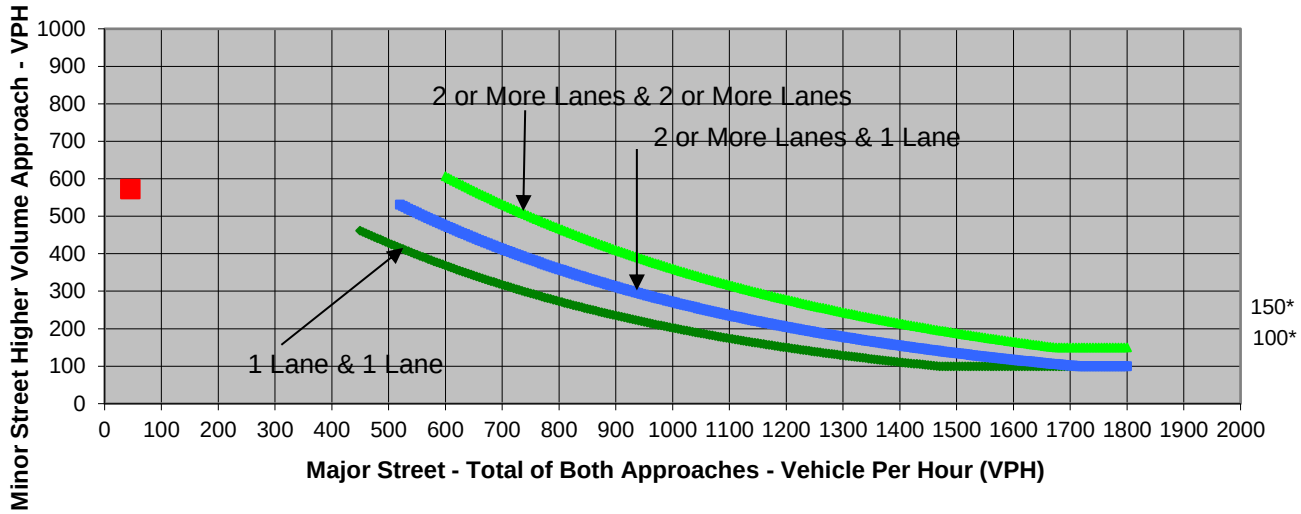
Major Street	Bancroft Way	Project	TheLabs
Minor Street	Sixth St	Scenario	Existing No Project
		Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	27	15	10	0
Through	252	521	2	1
Right	1	37	26	6
Total	280	573	38	7

Major Street Direction

	North/South
X	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Bancroft Way	Sixth St	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**45**	**573**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

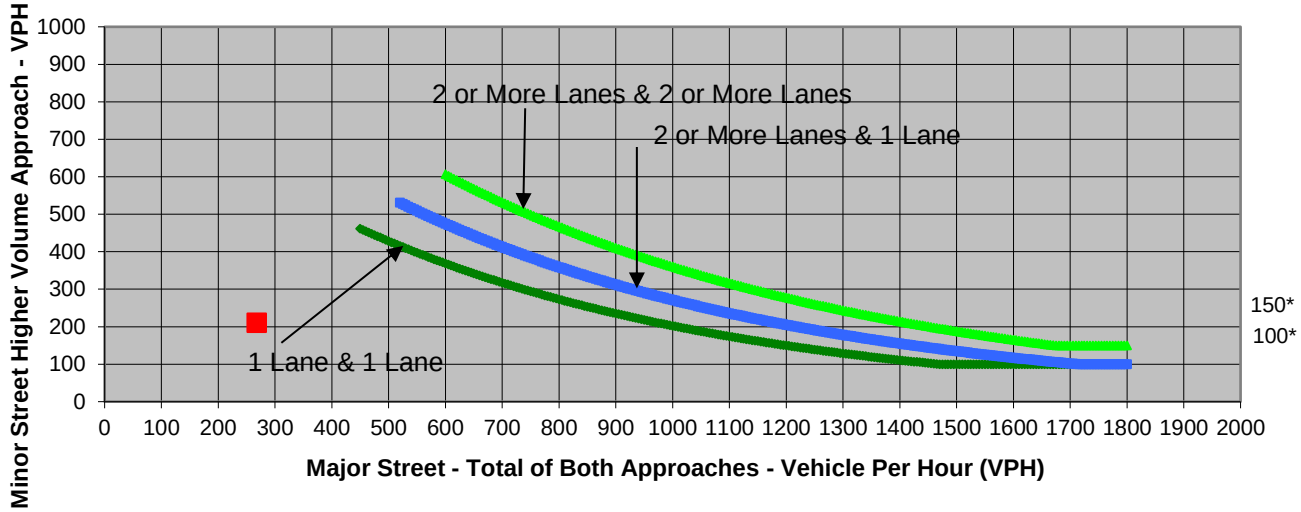
Major Street	Fifth St	Project	TheLabs
Minor Street	Allston Way	Scenario	Existing No Project
		Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	10	49	5	7
Through	114	60	89	163
Right	26	9	3	41
Total	150	118	97	211

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Fifth St	Allston Way	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**268**	**211**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

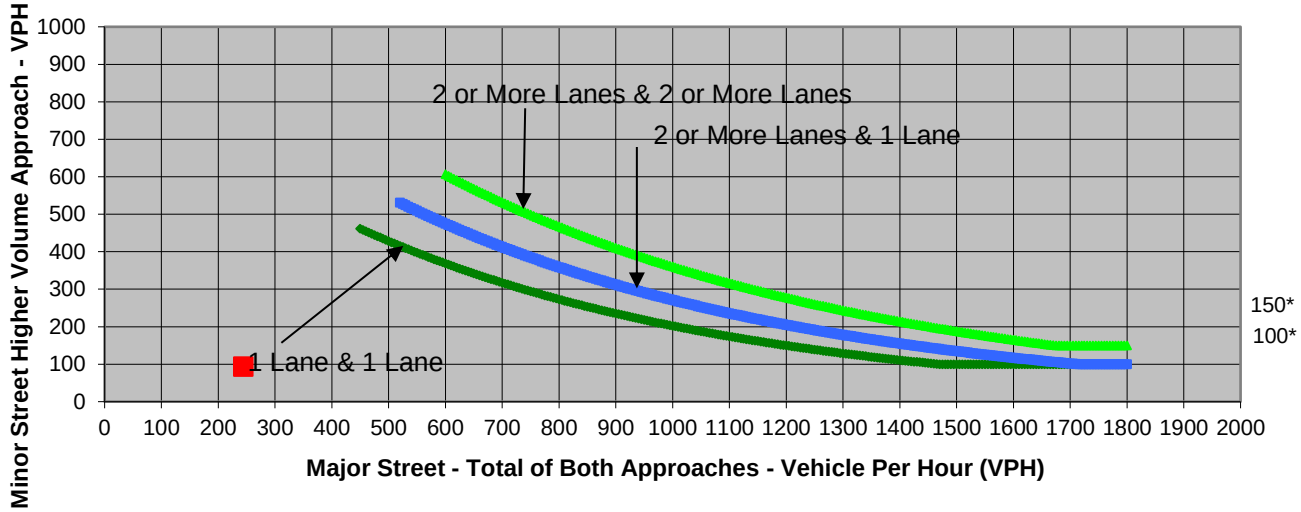
Major Street	Fourth St	Project	TheLabs
Minor Street	Bancroft Way	Scenario	Existing No Project
		Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	9	18	21	9
Through	152	50	25	15
Right	12	3	6	70
Total	173	71	52	94

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Fourth St	Bancroft Way	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**244**	**94**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Fifth St
Minor Street	Bancroft Way

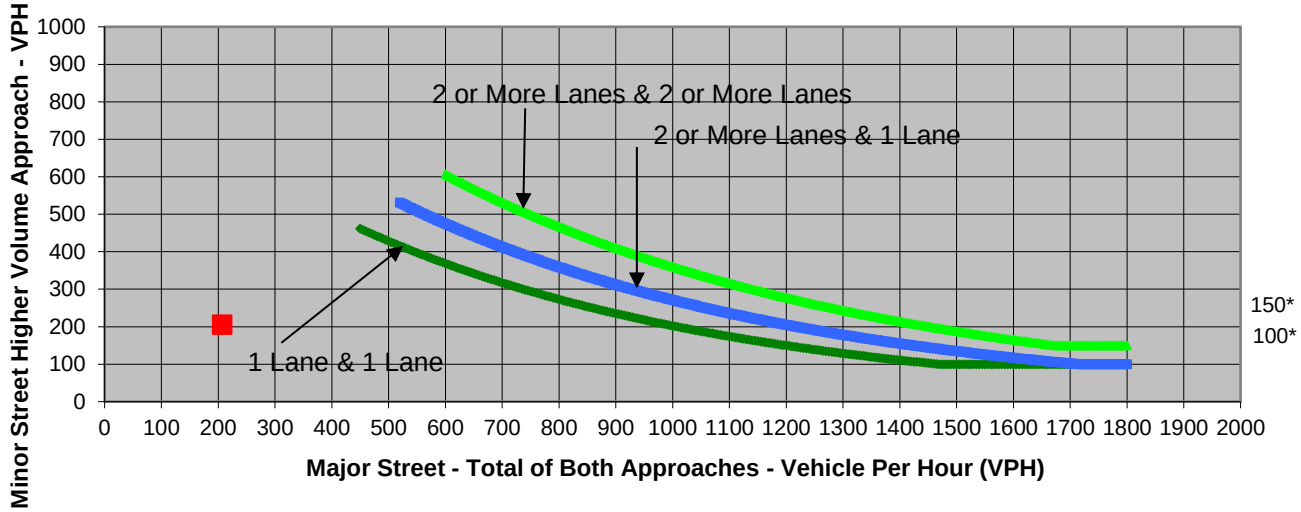
Project	TheLabs
Scenario	Existing No Project
Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	14	8	5	2
Through	96	62	199	113
Right	19	8	2	25
Total	129	78	206	140

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Fifth St	Bancroft Way	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**207**	**206**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

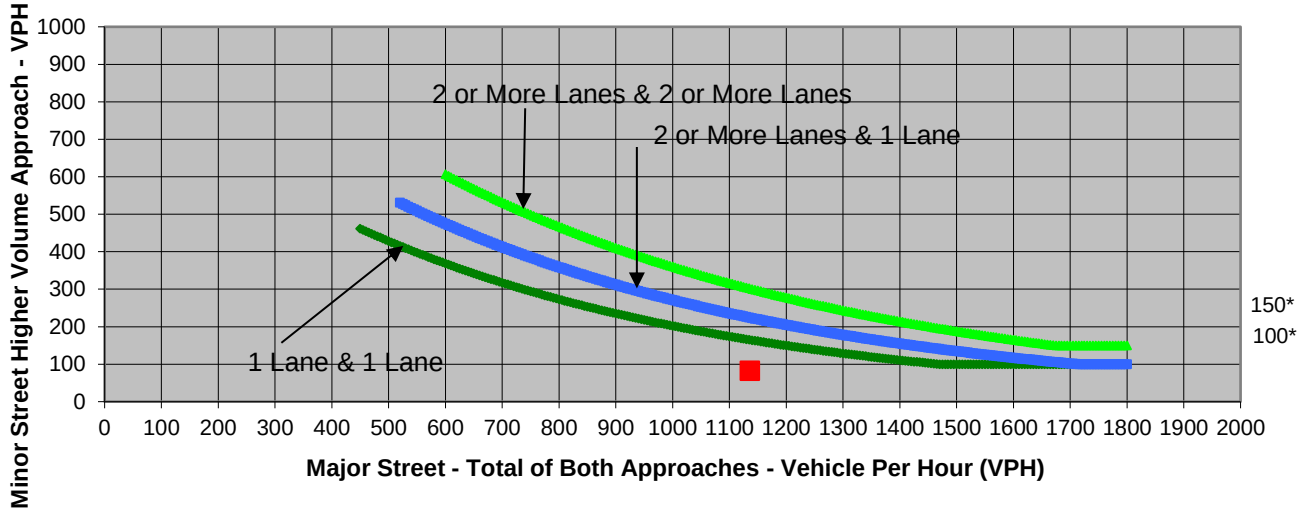
Major Street	Sixth St	Project	TheLabs
Minor Street	Bancroft Way	Scenario	Existing No Project
		Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	91	13	20	2
Through	635	378	2	3
Right	5	14	61	14
Total	731	405	83	19

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Sixth St	Bancroft Way	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**1,136**	**83**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

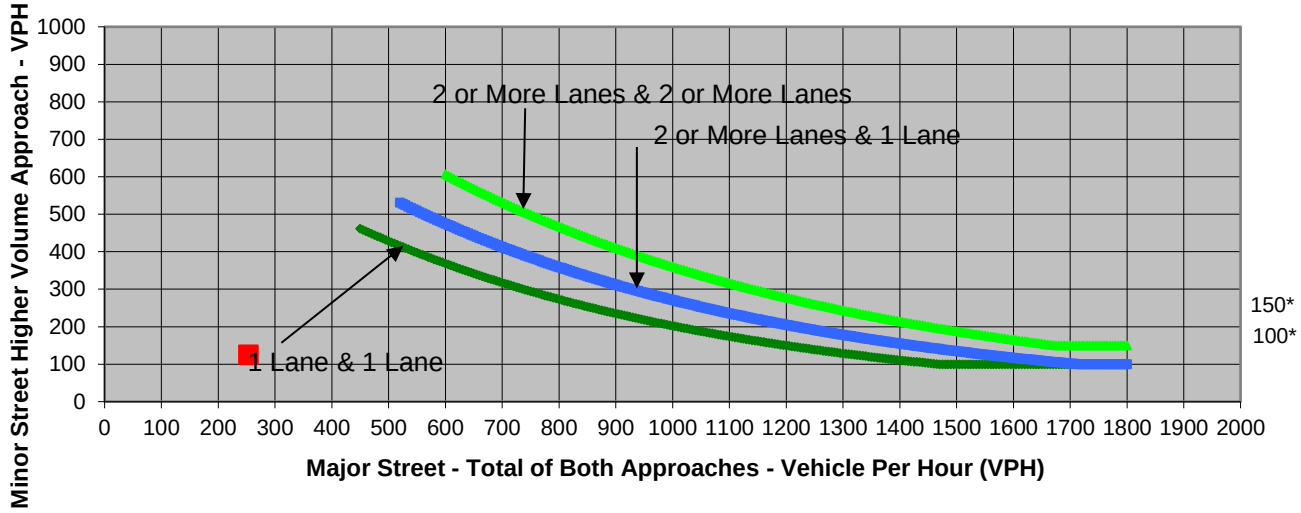
Major Street	Fifth St	Project	TheLabs
Minor Street	Allston Way	Scenario	Near Term
		Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	4	51	13	37
Through	35	149	105	26
Right	11	3	7	15
Total	50	203	125	78

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Fifth St	Allston Way	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**253**	**125**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Fourth St
Minor Street	Bancroft Way

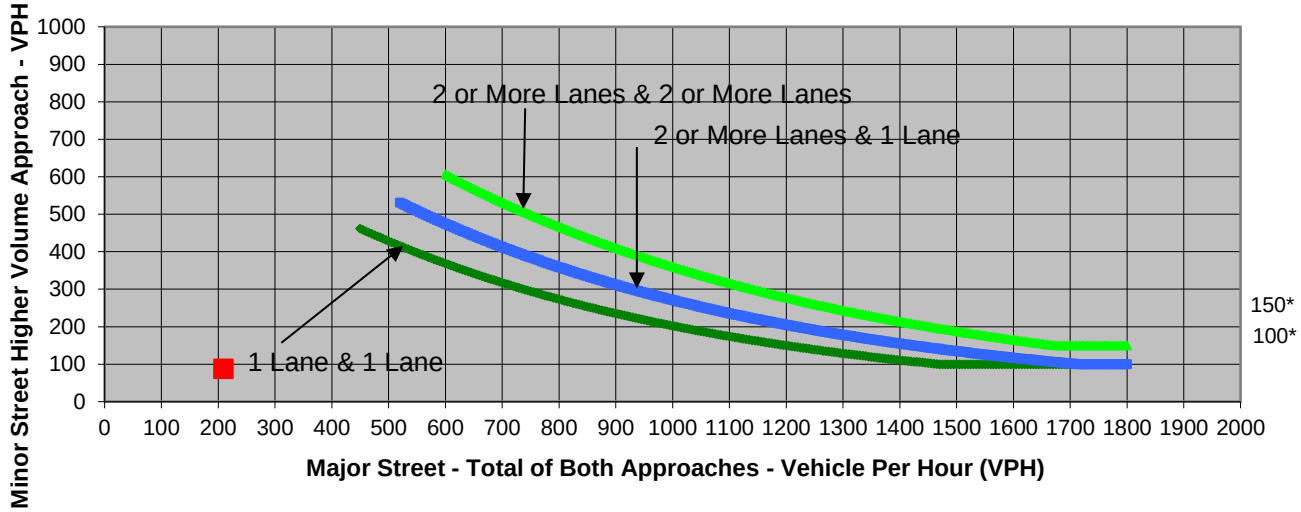
Project	TheLabs
Scenario	Near Term
Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	4	39	15	6
Through	25	107	26	68
Right	0	34	1	14
Total	29	180	42	88

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Fourth St	Bancroft Way	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**209**	**88**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Fifth St
Minor Street	Bancroft Way

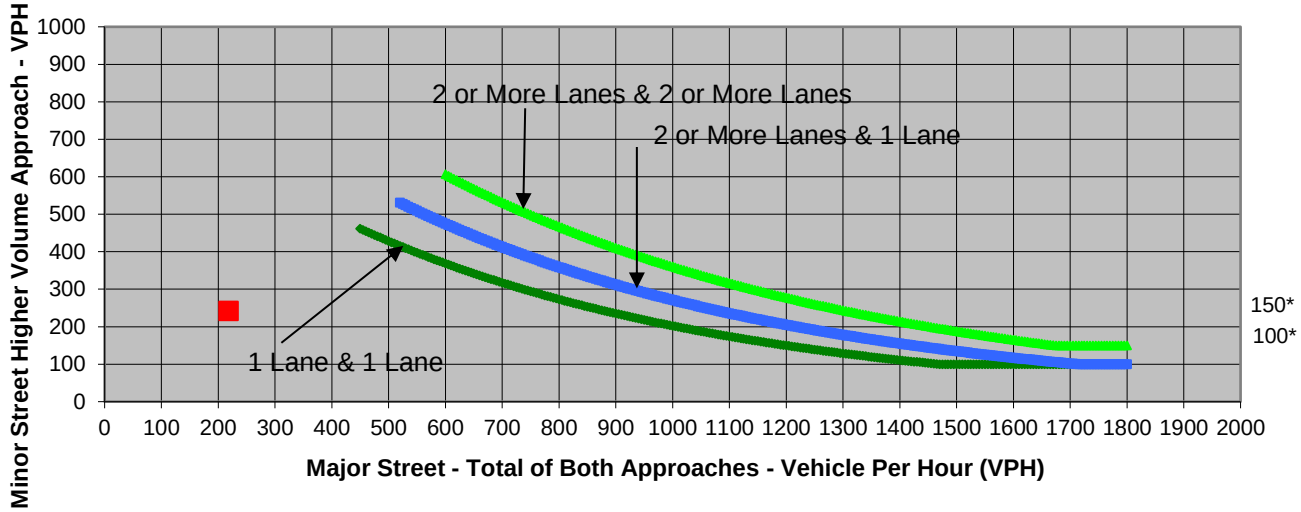
Project	TheLabs
Scenario	Near Term
Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	5	48	6	22
Through	44	101	213	112
Right	12	8	23	5
Total	61	157	242	139

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Fifth St	Bancroft Way	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**218**	**242**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Bancroft Way
Minor Street	Sixth St

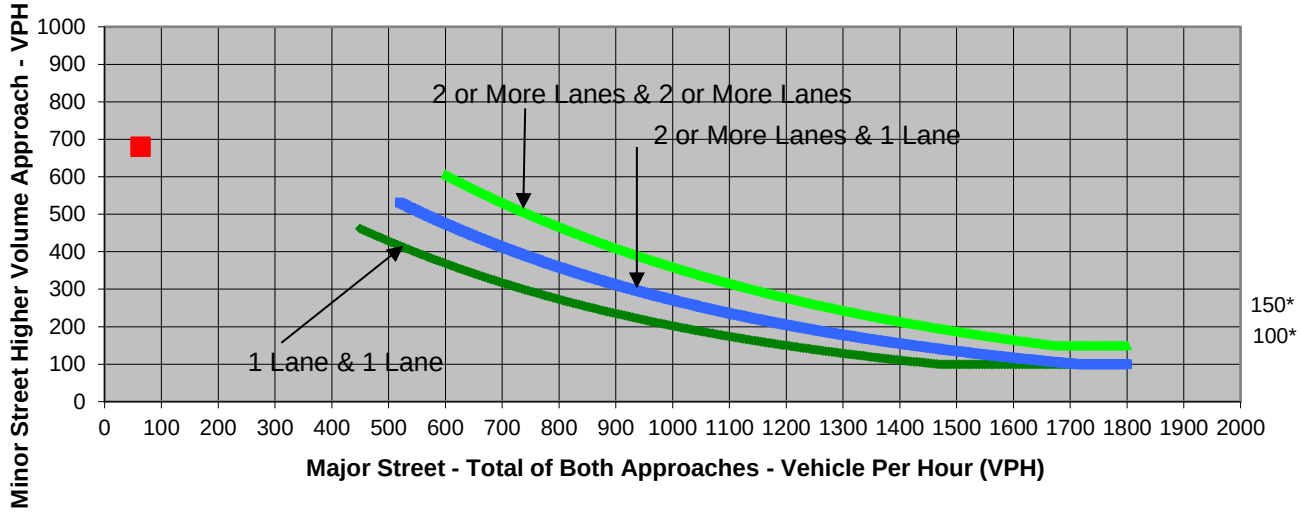
Project	TheLabs
Scenario	Near Term
Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	59	15	23	0
Through	292	600	2	1
Right	1	65	31	6
Total	352	680	56	7

Major Street Direction

	North/South
X	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Bancroft Way	Sixth St	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**63**	**680**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

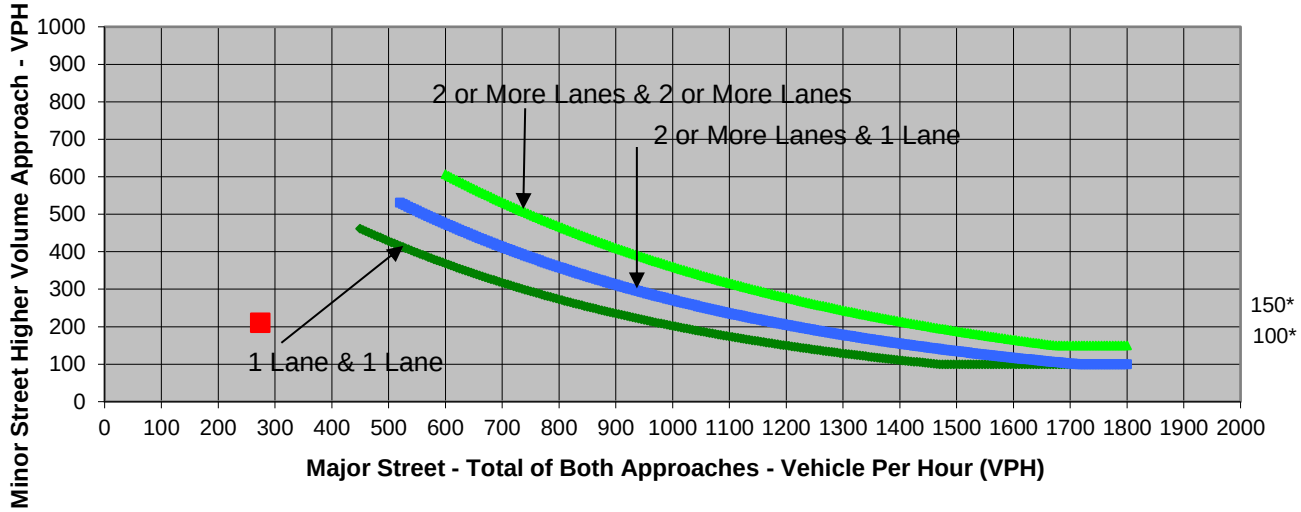
Major Street	Fifth St	Project	TheLabs
Minor Street	Allston Way	Scenario	Near Term
		Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	10	49	5	7
Through	115	65	89	163
Right	26	9	3	41
Total	151	123	97	211

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Fifth St	Allston Way	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**274**	**211**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Fourth St
Minor Street	Bancroft Way

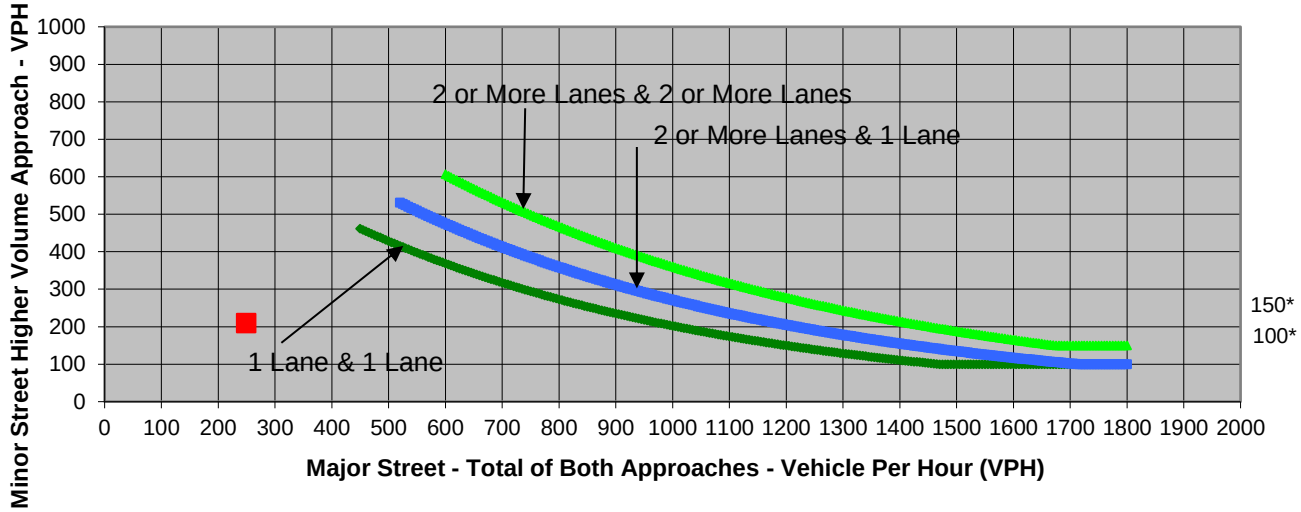
Project	TheLabs
Scenario	Near Term
Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	9	18	72	9
Through	152	50	132	25
Right	12	8	6	70
Total	173	76	210	104

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Fourth St	Bancroft Way	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**249**	**210**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

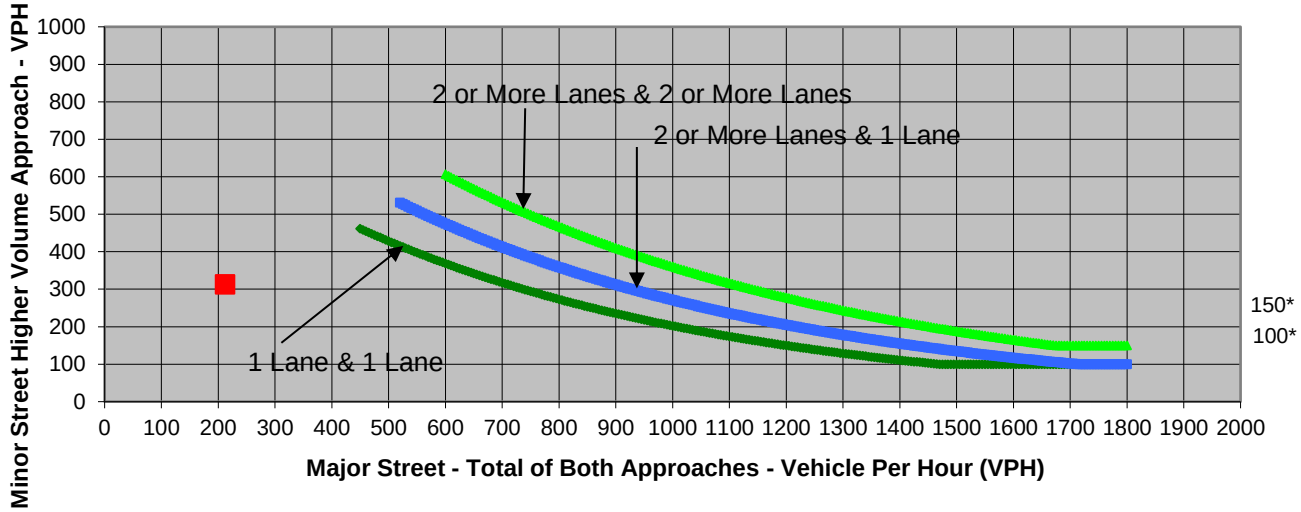
Major Street	Fifth St	Project	TheLabs
Minor Street	Bancroft Way	Scenario	Near Term
		Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	14	13	5	2
Through	96	62	306	123
Right	19	8	2	26
Total	129	83	313	151

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Fifth St	Bancroft Way	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**212**	**313**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

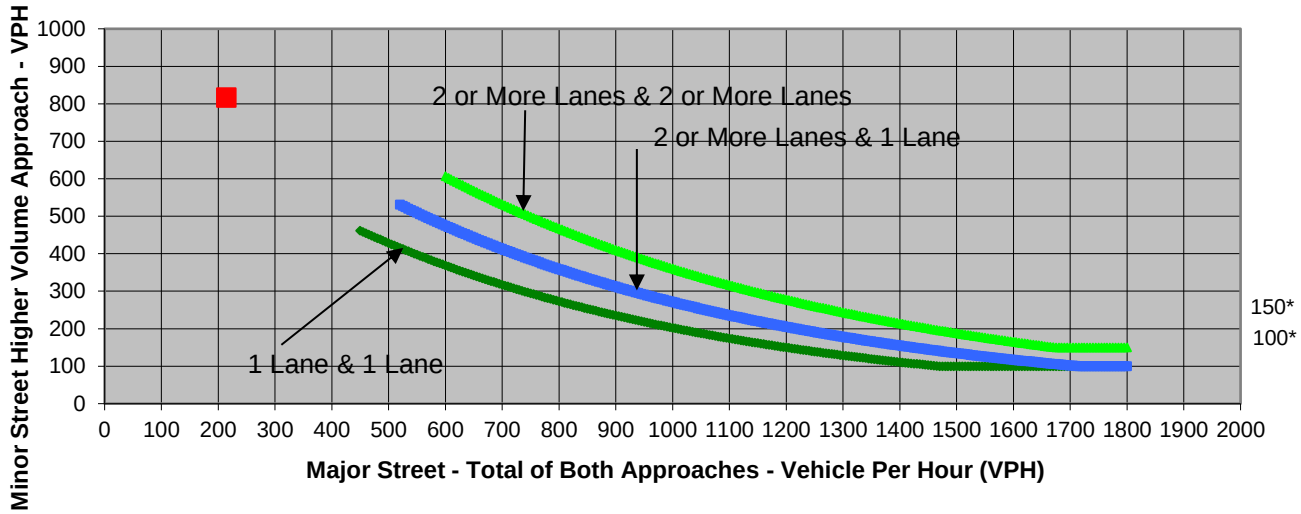
Major Street	Bancroft Way	Project	TheLabs
Minor Street	Sixth St	Scenario	Near Term
		Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	97	13	100	2
Through	715	414	2	3
Right	5	19	93	14
Total	817	446	195	19

Major Street Direction

	North/South
X	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Bancroft Way	Sixth St	
Number of Approach Lanes	**1**	**1**	**YES**
Traffic Volume (VPH) *	**214**	**817**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

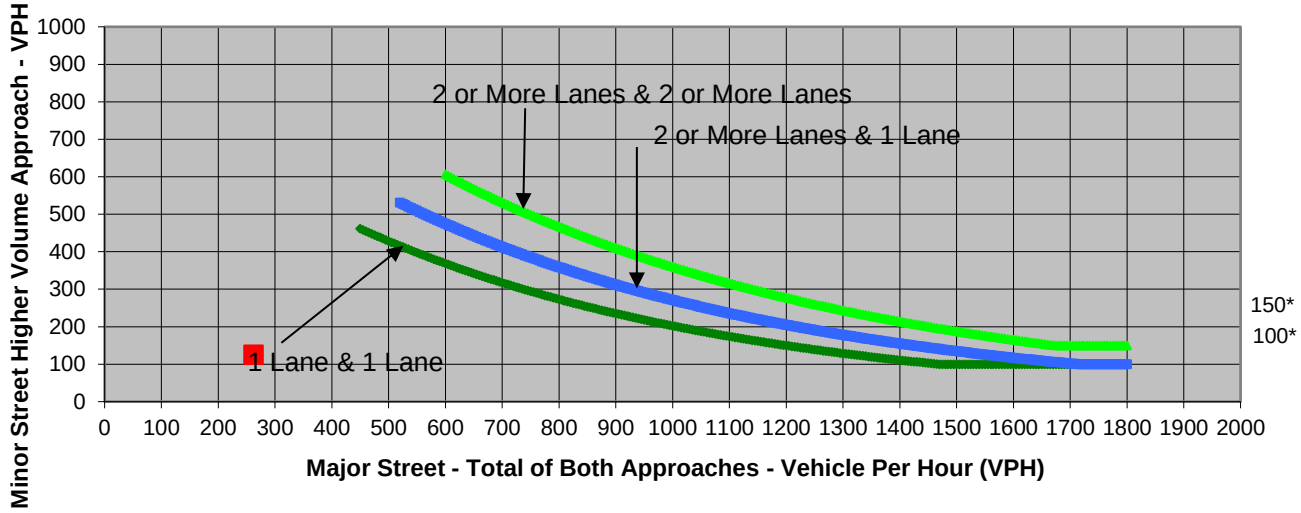
Major Street	Fifth St	Project	TheLabs
Minor Street	Allston Way	Scenario	Near Term Plus Project
		Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	4	51	13	81
Through	35	149	105	26
Right	20	3	7	15
Total	59	203	125	122

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Fifth St	Allston Way	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**262**	**125**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Fourth St
Minor Street	Bancroft Way

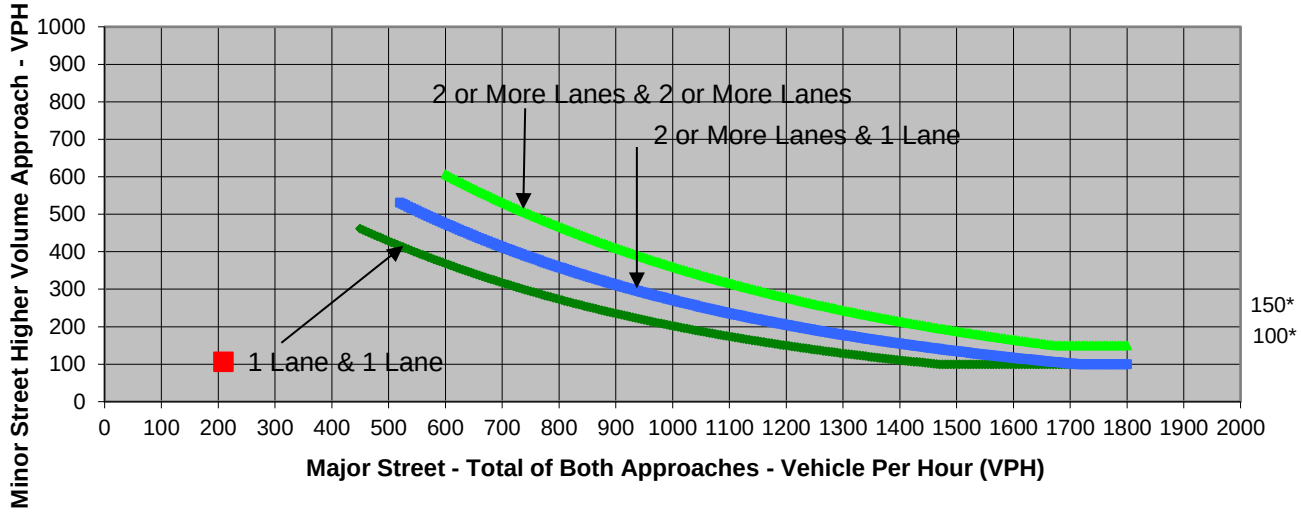
Project	TheLabs
Scenario	Near Term Plus Project
Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	4	39	17	6
Through	25	107	29	87
Right	0	34	1	14
Total	29	180	47	107

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Fourth St	Bancroft Way	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**209**	**107**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

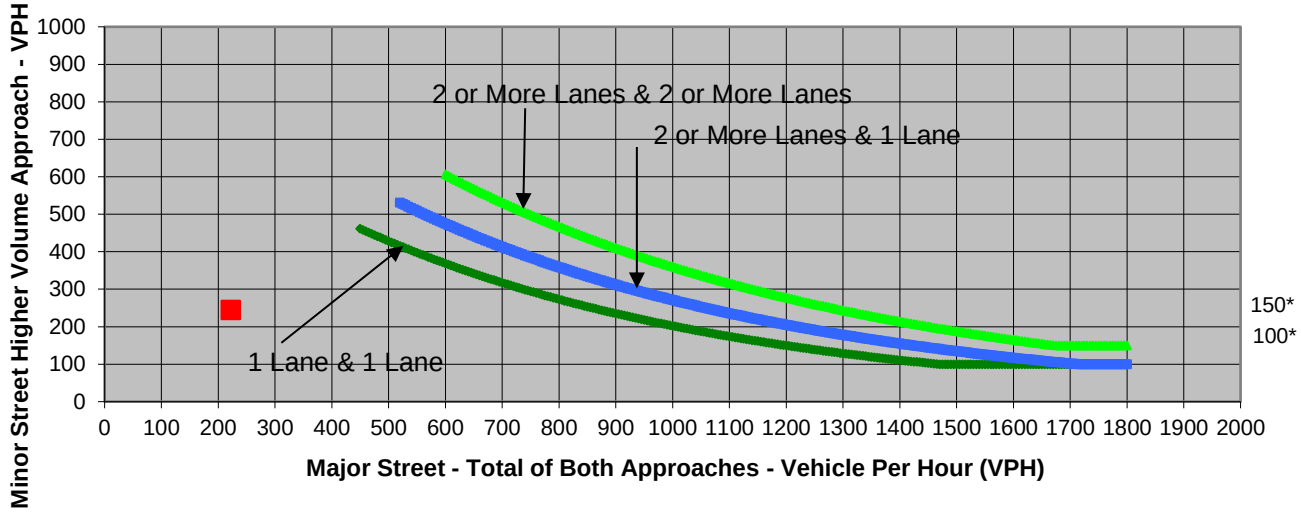
Major Street	Fifth St	Project	TheLabs
Minor Street	Bancroft Way	Scenario	Near Term Plus Project
		Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	5	52	6	22
Through	44	101	216	131
Right	12	8	23	26
Total	61	161	245	179

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Fifth St	Bancroft Way	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**222**	**245**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Bancroft Way
Minor Street	Sixth St

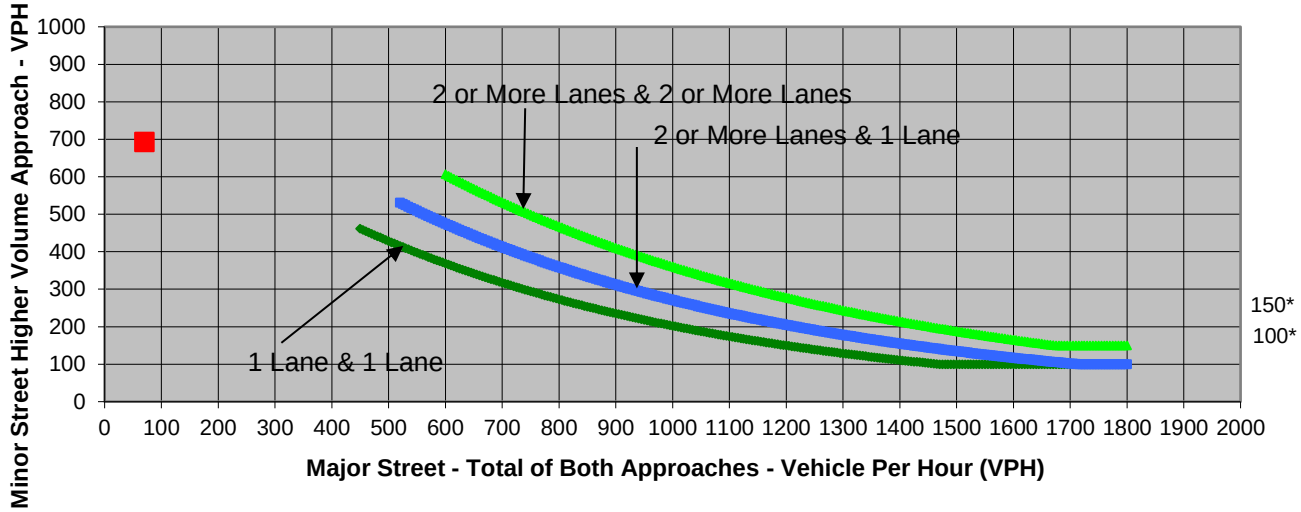
Project	TheLabs
Scenario	Near Term Plus Project
Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	86	15	26	0
Through	292	600	2	1
Right	1	78	35	6
Total	379	693	63	7

Major Street Direction

	North/South
X	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Bancroft Way	Sixth St	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**70**	**693**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

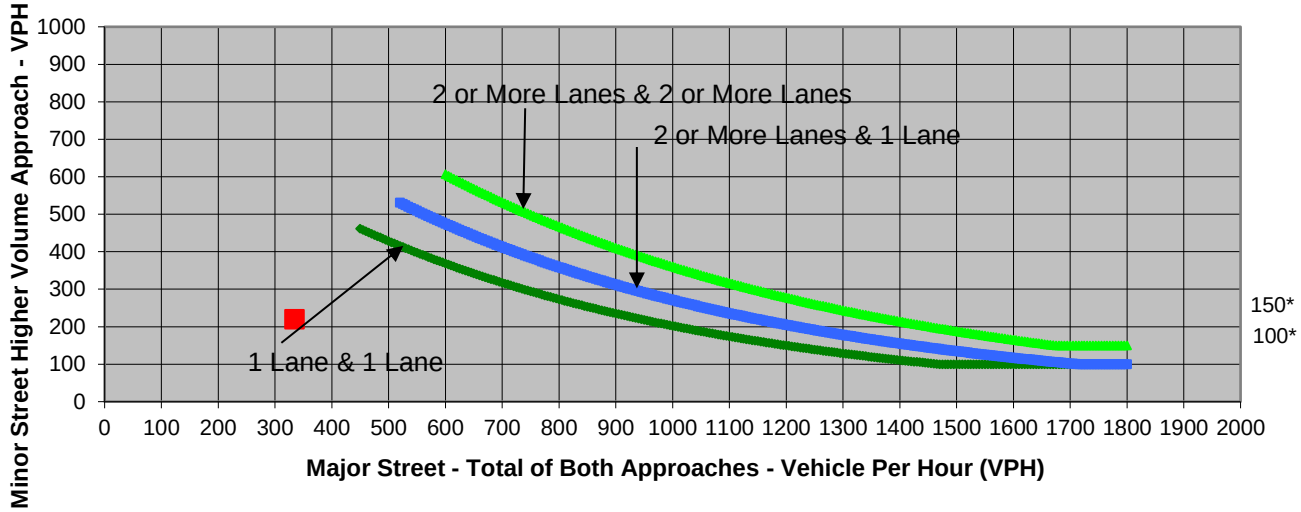
Major Street	Fifth St	Project	TheLabs
Minor Street	Allston Way	Scenario	Near Term Plus Project
		Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	10	49	5	16
Through	115	65	89	163
Right	86	9	3	41
Total	211	123	97	220

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Fifth St	Allston Way	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**334**	**220**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

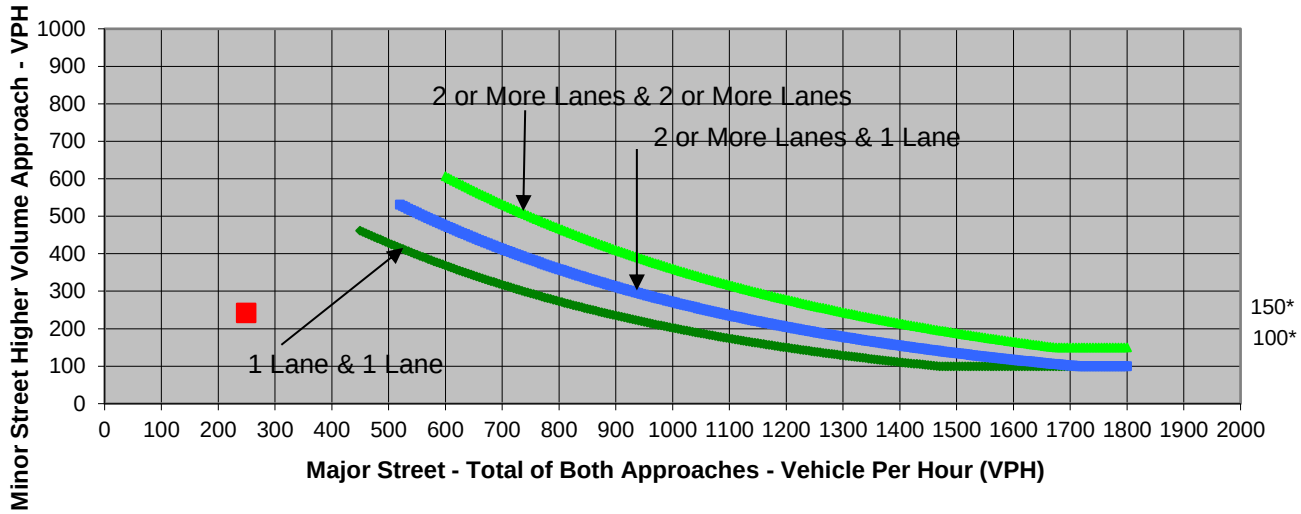
Major Street	Fourth St	Project	TheLabs
Minor Street	Bancroft Way	Scenario	Near Term Plus Project
		Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	9	18	80	9
Through	152	50	156	28
Right	12	8	6	70
Total	173	76	242	107

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Fourth St	Bancroft Way	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**249**	**242**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

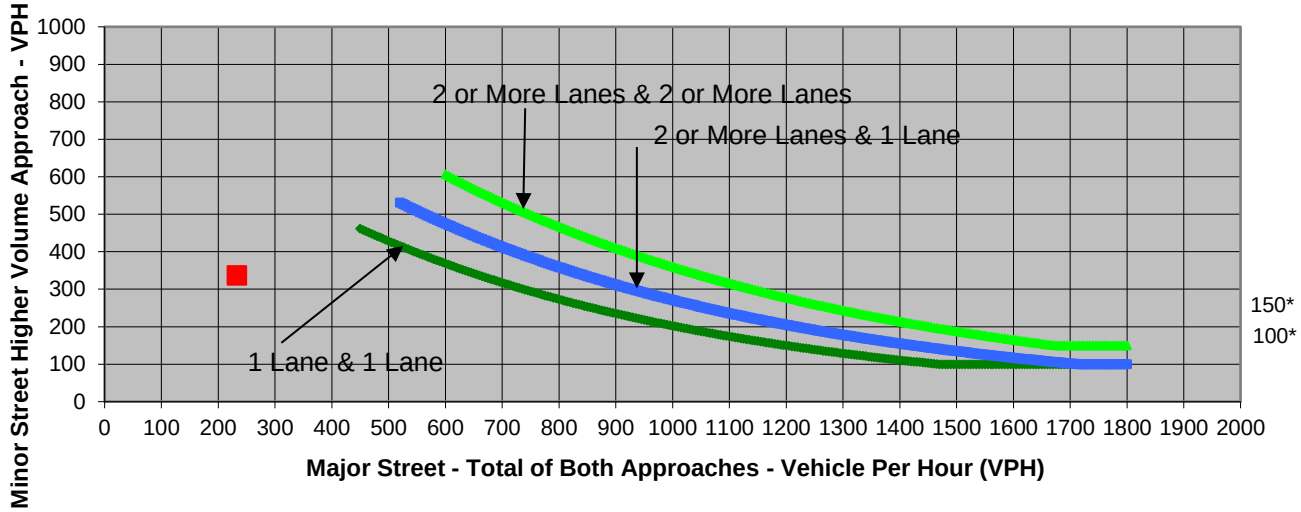
Major Street	Fifth St	Project	TheLabs
Minor Street	Bancroft Way	Scenario	Near Term Plus Project
		Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	14	34	5	2
Through	96	62	330	126
Right	19	8	2	30
Total	129	104	337	158

Major Street Direction

X	North/South
	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Fifth St	Bancroft Way	
Number of Approach Lanes	**1**	**1**	**NO**
Traffic Volume (VPH) *	**233**	**337**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

Major Street	Bancroft Way
Minor Street	Sixth St

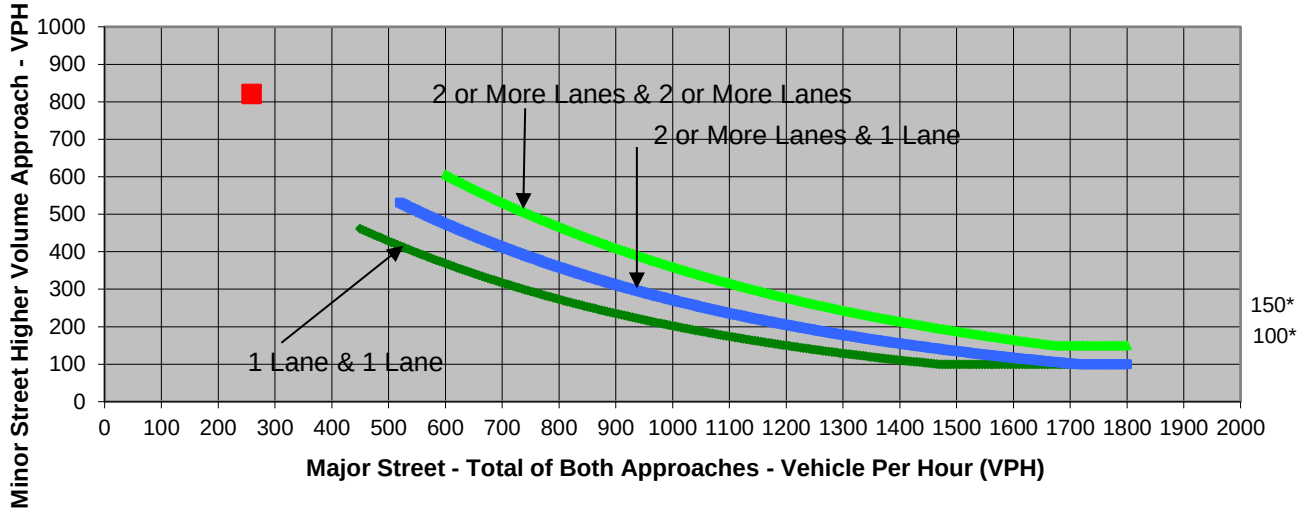
Project	TheLabs
Scenario	Near Term Plus Project
Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	101	13	118	2
Through	715	414	2	3
Right	5	22	120	14
Total	821	449	240	19

Major Street Direction

	North/South
X	East/West



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Bancroft Way	Sixth St	
Number of Approach Lanes	**1**	**1**	**YES**
Traffic Volume (VPH) *	**259**	**821**	

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

Appendix D
TDM Plan

FEHR PEERS

Memorandum

Date: September 13, 2021

To: Bridget Metz, SteelWave

From: Jordan Brooks and Sam Tabibnia, Fehr & Peers

Subject: TheLabs Life Sciences Development – Transportation Demand Management Plan

OK21-0401

This memorandum details the Transportation Demand Management (TDM) plan for the proposed TheLabs development in West Berkeley. Although the project would not have a significant impact on vehicle miles traveled (VMT) and no mitigation is required, it would implement a TDM Plan to reduce VMT and reduce automobile trip generation and parking demand through measures that discourage the use of automobiles and encourage the use of other travel modes.

This memorandum describes the project and its setting, lists the proposed TDM strategies that the project would implement, provides estimates of the effectiveness of the TDM Plan for reducing VMT, and describes the monitoring and evaluation of the TDM Plan.

Project Description

The proposed project is located in West Berkeley and includes the renovation of about 106,200 square feet of existing commercial uses, development of a 415-space parking garage, and development of about 159,100 square feet of new life sciences office/R&D and light manufacturing uses.

Project Location

The proposed project is located between Bancroft Way, Fifth Street, Allston Way, and the railroad in West Berkeley.

The project site has a Walk Score[1] of 91 out of 100 and a Bike Score[2] of 96 out of 100, based on the many nearby commercial uses and good bicycle and pedestrian connectivity.[3] There are continuous sidewalks throughout the area, and low-stress bicycle access along Sixth Street and Channing Way connect the project site to adjacent commercial areas. Additionally, a Bay Wheels bikeshare station is located near the project on Fourth Street at Addison Street.

The project site has a Transit Score[4] of 54 out of 100, indicating many transit options are available nearby. The project is three blocks from the Berkeley Amtrak Station and within easy walking distance of several bus routes, including AC Transit's Line 36 along Dwight Way, Line 51B along University Avenue, and Lines 72 and 72M along San Pablo Avenue, as well as the West Berkeley Shuttle stop on Dwight Way at Sixth Street.

The project's location within walking distance of a variety of uses and near good bicycle and transit facilities is expected to result in a relatively high rate of pedestrian, bicycle, and transit trips. This is evidenced in part by the travel patterns of the area's existing workers, per the US Census. Nationwide, 86 percent of workers commute via automobile, compared to 75 percent of workers in West Berkeley.

Table 1 shows the project trip generation by travel mode based on existing mode splits in West Berkeley, as summarized in the project's Preliminary Transportation Assessment memorandum.

Table 1: Project Trip Generation by Travel Mode

Mode	Mode Share Adjustment Factor[1]	AM Peak Hour	PM Peak Hour
Automobile	1.00	180	181
Transit	0.10	18	18
Bike	0.08	14	14
Walk	0.07	13	13
	Total Net Trips	**225**	**226**

Notes:

1. Based on the mode share estimates for workers in West Berkeley from the 2012-2016 American Community Survey 5-Year Estimates.

Source: Fehr & Peers, 2021.

[1] Walk Score is a measure of the walkability of any address based on distance to amenities within a 5 to 30-minute walk, and other metrics such as block length and intersection density.

[2] Bike Score measures if an area is good for biking considering the availability of bike infrastructure, terrain, destinations, street connectivity, and number of bike commuters.

[3] https://www.walkscore.com/score/2222-fourth-st-berkeley-ca-94710

[4] Transit Score measures how well a location is served by public transit based on the frequency of routes, type of transit (rail, bus, etc.), and distance to the nearest stop.

TDM Strategies

This section describes the strategies that would be implemented at the project, as well as project features that would reduce the automobile trips generated by the project. Some of these strategies would be directly implemented by the building management and others would be implemented by individual tenants. The TDM strategies include both one-time physical infrastructure improvements and on-going operational strategies. Physical improvements would be implemented as part of the project and thus are anticipated to have a one-time capital cost. Some level of ongoing maintenance cost may also be required for certain measures. Operational strategies provide on-going incentives and support for the use of non-auto transportation modes. These TDM measures have monthly or annual costs and would require on-going management.

The TDM Plan, which would be implemented at the time of the occupancy, would include the following strategies:

A. Provide shuttle service between the project and a BART Station during weekday peak commute periods (6:00 AM to 10:00 AM and 3:00 PM to 7:00 PM). The project would also explore the feasibility, and if feasible, will coordinate the shuttle service with existing shuttle services, and/or other employers in West Berkeley. Shuttle service would be adjusted based on ridership
B. Provide bike lockers, showers, personal lockers, and a repair station on-site to encourage bicycling to the site
C. Coordinate with City of Berkeley, and/or other regional agencies to facilitate the potential installation of a BayWheels bikeshare station along the project frontage
D. Offer to provide free parking spaces for at least two car share vehicles (ZIP Car, etc.)
E. Offer carpool/ride-matching services, such as ZimRide, ComoVee, or 511.org RideShare, to pair employees interested in forming commute carpools.
F. Provide at least 10 spaces of preferential carpool parking, including free parking for carpoolers if employees are charged for on-site parking. Carpool parking spaces not occupied by 10:00 AM would be available to other vehicles.
G. Require tenants to provide full or partial transit subsidy to project employees. Tenants may offer one of the following to employees that request it:[5]
    - A monthly commuter check (or alternatively Clipper Card, which is accepted by BART, AC Transit, and other major transit providers in the Bay Area)
    - Subsidized AC Transit bus pass
    - Subsidized Capital Corridor monthly ticket
H. Require tenants to provide pre-tax commuter benefits for project employees

[5] This analysis assumes that a transit fare subsidy of about $2.50 per employee per weekday (value to rider, not cost to employer) will be available to all site employees.

I. Regularly provide project tenants and employees information about various transportation options in the area and the TDM strategies provided by the project. The main lobby of each major project building shall also provide all the information on transportation options, such as a TransitScreen.
J. Provide information on the Bay Area Commuter Benefits Program to all building tenants. As of September 30, 2014, Bay Area employers with 50 or more full-time employees within the Bay Area Air Quality Management District (Air District) geographic boundaries are required to register and offer commuter benefits to their employees in order to comply with Air District Regulation 14, Rule 1, also known as the Bay Area Commuter Benefits Program. Employers must select one of four Commuter Benefit options to offer their employees: a pre-tax benefit, an employer-provided subsidy, employer-provided transit, or an alternative commute benefit. (Information about Commute Benefits Program is at 511.org/employers/commuter/overview.)

Operational TDM strategies are most effective for people who commute to and from a site on a regular basis, especially during weekday peak commute periods when transit service peaks and is most conveniently available. Thus, these strategies are generally targeted at office workers. Visitors are not directly targeted because they would visit the project too infrequently to be aware of the TDM benefits or to make them cost-effective. However, some of the strategies, especially the ones that would improve the infrastructure, would also benefit the site visitors.

VMT Reduction Estimates

Table 2 summarizes the estimated effectiveness of the TDM Plan components in reducing project VMT. The effectiveness of the strategies is primarily based on research compiled in *Quantifying Greenhouse Gas Mitigation Measures* (California Air Pollution Control Officers Association [CAPCOA], August 2010), which is a resource for local agencies to quantify the benefit, in terms of reduced travel demand, of implementing various TDM strategies. It is estimated that the proposed TDM Plan would reduce the project-generated VMT by between 8 and 15 percent.

The VMT reduction ranges in Table 2 represent conservative assumptions about potential VMT reduction at the low end of the range. Due to the location of the project in an area that has good pedestrian and bicycle access, along with moderate peak-hour transit access, a VMT reduction in the middle of the range (10 to 12 percent) is expected with this TDM program.

Table 2: TDM Plan VMT Reduction Estimates

TDM Strategy	Description	Estimated VMT Reduction[1]
BART Shuttle	Provide peak commute period shuttle service to BART	3% - 6%
Bicycle Amenities	Provide secure bicycle parking, showers and lockers, and repair station	<1%
Bike Share	Allow and facilitate installation of a potential BayWheels bikeshare station along the site frontage	
Carshare Parking Spaces	Dedicate on-site carshare parking spaces	<1%
Carpool and Ride-Matching Assistance	Assist project employees in forming carpools and provide preferential carpool parking spaces	1%
Transit Fare Subsidy	Require tenants to provide a monthly transit subsidy to employees	4% - 8%[2]
Pre-Tax Commuter Benefits	Require tenants to provide pre-tax commuter benefits to employees	
Marketing and Education	Active marketing and education of employees on various commuting options	N/A[3]
	Total Estimated Vehicle Trip Generation	**8% – 15%**

Notes:
1. Based on *Quantifying Greenhouse Gas Mitigation Measures* (California Air Pollution Control Officers Association [CAPCOA], August 2010)
2. Assuming a transit subsidy of about $2.50 per day per employee (value to transit user and not necessarily the cost) available to all employees.
3. The effectiveness of this strategy cannot be quantified at this time. This does not necessarily imply that the strategy is ineffective. It only demonstrates that existing literature does not provide a robust methodology for calculating its effectiveness. In addition, many strategies are complementary to each other and isolating their specific effectiveness may not be feasible.

Source: Fehr & Peers, 2021.

Monitoring and Evaluation

This TDM program would include regular periodic evaluation of the program to assess the effectiveness of the various strategies implemented. The project applicant would submit an annual compliance report for the first five years following completion of the project for review and approval by the City. The annual report would consist of the following:

1. A description of the TDM measures and services provided at the project, to the extend feasible the level of use or participation for each measure, and compliance with the required measures in the TDM plan.
2. Results of an annual employee survey that quantify the mode split for site employees, the perception of the TDM plan by the project employees. The survey results should focus on the weekday daytime employees only.

If timely reports are not submitted and/or the annual reports indicate that the project applicant has failed to implement the TDM Plan, the project will be considered in violation of the Conditions of Approval. The project shall not be considered in violation if the TDM Plan is implemented but the estimated reduction goals are not achieved. If in five successive years the project is found to meet the stated TDM goal, additional surveys and monitoring shall be suspended until such a time as the City deems they are needed.

Please contact Jordan Brooks (j.brooks@fehrandpeers.com or 510-587-9429) with questions or comments.