APPENDIX F

TRANSPORTATION IMPACT STUDY

1188 East 14th Street Mixed-Use Development, San Leandro

Transportation Impact Study – Final
October 2020

Prepared For: The Martin Group

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1.0 INTRODUCTION

This transportation impact study (TIS) describes the existing transportation setting and provides a transportation impact analysis for the mixed-use residential development project at 1188 East 14th Street (herein referred to as the "proposed project") based on project plans dated August 28, 2020. This study has been prepared in accordance with the Scope of Work approved by the City of San Leandro Engineering and Transportation Department. Transportation data for project analysis was provided from field observations and data collected by CHS Consulting Group (CHS) adjacent to, and in proximity of, the proposed project and supplemental data provided by the San Leandro Community Development Department and Engineering and Transportation Department. The purpose of the analysis presented in this study is to inform the environmental review of the proposed project.

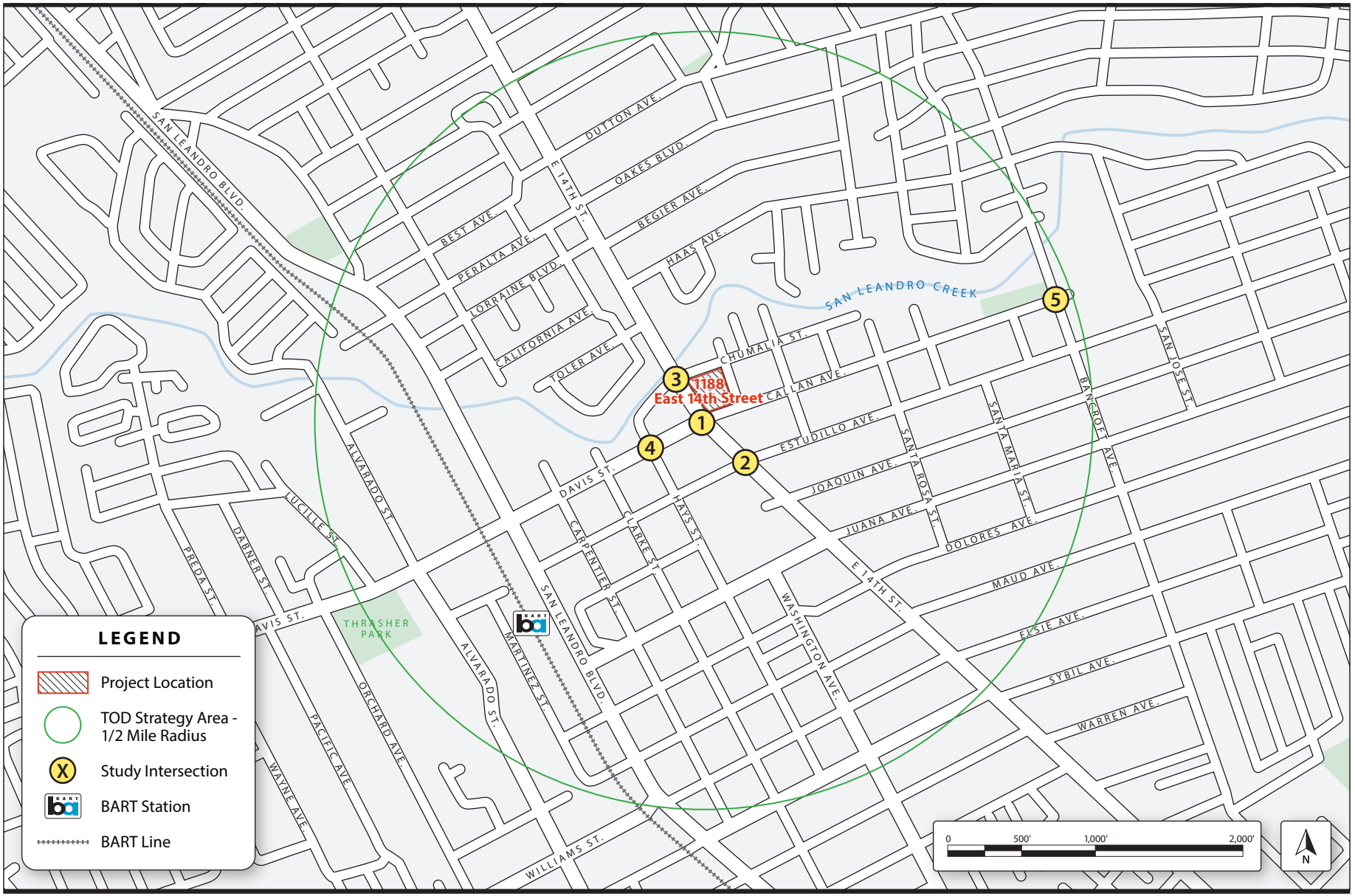
The following topics are addressed in this analysis:

- Traffic site circulation conditions;
- Level of Service (LOS) conditions;
- 95th Percentile Queue Length conditions;
- Vehicle Miles Traveled (VMT);
- Transit conditions;
- Pedestrian conditions; and
- Bicycle conditions.

1.1 Project Location

The project site is located on multiple parcels along East 14th Street in San Leandro, California. The project site consists of approximately 1.66 acres on Parcels 77-447-14-6 (1188 East 14th Street), 77-447-14-7 (1134 East 14th Street), 77-447-15-6 (1120 East 14th Street), and 77-447-7-1 (Hyde Street). The project site is bounded by Chumalia Street to the north, Hyde Street to the east, Callan Avenue to the south, and East 14th Street to the west. The proposed project is also located approximately one-half mile northeast of the San Leandro Bay Area Rapid Transit (BART) station and is located in the general vicinity of downtown San Leandro. The project site is located in the DA-1(S) Zoning District and is within the Downtown San Leandro Transit-Oriented Development (TOD) Strategy area (herein referred to as the "TOD Strategy Plan")(see **Figure 1**).[1]

[1] The Downtown San Leandro Transit-Oriented Development Strategy (TOD Strategy Plan) is a document that establishes a land use framework, a comprehensive circulation system, and design and development guidelines that regulate new development in downtown San Leandro for the next 20 to 30 years. (Source: Downtown San Leandro Transit-Oriented Development Strategy, City of San Leandro, September 4, 2007)



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Consulting Group

Figure 1
Project Location

1.2 Project Description

The proposed project would demolish three existing structures, including a former CVS drug store, a two-story commercial office building, and a two-story retail shopping center, and construct a mixed-use residential development consisting of 196 dwelling units, 286 parking spaces, and approximately 28,914 gross square feet (gsf) of retail floor area. The proposed project would construct a five-story, 75-foot-tall building consisting of three floors of residential over two-level structured parking with ground floor retail. The proposed project would have a residential unit mix of 30 percent studio units, 48 percent one-bedroom units, 18 percent two-bedroom units, and four percent three-bedroom units.

The ground-level parking garage would provide 70 total off-street parking spaces for retail use consisting of 47 standard spaces, one (1) standard electric vehicle (EV) space, 18 compact spaces, one (1) standard ADA-accessible space, one (1) ADA-accessible van spaces, and two (2) ADA-accessible EV space. Additionally, 19 standard diagonal on-street parking spaces would be provided along the west side of Hyde Street. The proposed project would provide 216 parking spaces for residents and guests on the second level of the parking garage comprised of approximately 108 spaces in vertical car stackers, 18 compact parking spaces, six (6) standard ADA accessible spaces, one (1) ADA-accessible Van space, one (1) ADA-accessible EV space, six (6) clean air/vanpool spaces, 55 standard parking spaces, and 21 standard EV spaces.

In addition, 71 parking spaces located on the second level of the parking garage would be designated flex parking made available to retail users between the hours of 9:00 a.m. and 6:00 p.m., five to six days per week. The 108 vertical car stacker spaces located on the second level would be for residential use only at all times and would be separated from flex parking by an access control system. A second access control system would be located at the ground level of the Hyde Street garage entrance to restrict access to residents only outside of overflow flex parking hours.

The proposed project would provide a secure bicycle storage rooms on each level with a total storage capacity of approximately 76 long-term bicycle parking spaces. The proposed project would also provide eight (8) short-term bicycle parking spaces within the sidewalk at the proposed project frontages along East 14th Street and Callan Avenue.

The primary pedestrian entrance to the residential portion of the proposed project would be located along Callan Avenue via a residential lobby, with stair and elevator access to levels two through five. The primary entrances to the retail portions of the proposed project would be provided along East 14th Street. Secondary pedestrian entrances for retail use would be provided along a pedestrian corridor within the ground level parking garage.

The primary vehicular entrances for ground level retail parking would be provided via a 24-foot wide driveway on Callan Avenue and a secondary vehicular entrance to the ground-level parking garage is provided via a 24-foot wide driveway on Chumalia Street. The diagonal on-street parking on Hyde Street would be accessible via Callan Avenue only, as Hyde Street would continue to operate as a one-way northbound-only roadway between Callan Avenue and the proposed project's Hyde Street garage entrance. Hyde Street at the proposed project's garage entrance would be converted from one-way northbound-only travel to a two-way operation to allow for inbound vehicular access to the second-level parking garage from Chumalia Street. **Figure 2** presents the site layout and plans for the proposed project.

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Figure 2
Project Site Plan

1.3 Study Scope and Approach

The purpose of this TIS is to provide a comprehensive evaluation of the proposed project and to examine the extent to which the proposed development would affect the surrounding multimodal transportation network. The scope of work for this TIS includes analysis of transportation impacts under four scenarios:

1. Existing Conditions
2. Existing plus Approved Project (Baseline) Conditions[2]
3. Baseline plus Project Conditions
4. Cumulative (2040) Conditions (includes proposed project)

For the purposes of assessing transportation conditions within the project area, study intersections were evaluated using the *2000 Highway Capacity Manual* operations methodology, consistent with the *City of San Leandro 2035 General Plan Update Draft Environmental Impact Report* (*DEIR*), *Downtown San Leandro Transit-Oriented Development Strategy Draft Environmental Impact Report*[3] (herein referred to as the "TOD Strategy DEIR"), and recent development studies within the City. Proposed project vehicle trips were estimated based on vehicular trip generation rates from the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition and ITE Trip Generation Handbook, 3rd Edition. Cumulative Conditions traffic volumes were developed using the Alameda County Transportation Commission (ACTC) Countywide Travel Demand Model and existing traffic counts at study intersections, consistent with the methodology used in the *City of San Leandro 2035 General Plan Update DEIR*. Trip distribution was based on existing traffic patterns in the proposed project study area. All of these assumptions and methodologies were reviewed and approved by City of San Leandro Staff.

The following five intersections were analyzed for this study:

1. East 14th Street at Davis Street/Callan Avenue (Signalized)
2. East 14th Street at Estudillo Avenue/Washington Plaza entrance (Signalized)
3. East 14th Street at Chumalia Street/Dan Niemi Way (Signalized)
4. Davis Street at Dan Niemi Way/Hays Street (Signalized)
5. Callan Avenue at Bancroft Avenue (Signalized)

[2] Existing plus Approved Project (Baseline) Conditions includes existing traffic conditions with the addition of estimated traffic generation from any project(s) that are currently under construction, built but not occupied, or are not built but have final development approval and a construction permit issued by the City of San Leandro as of October 24, 2018.

[3] The Downtown San Leandro Transit-Oriented Development Strategy Draft Environmental Impact Report (DEIR) was prepared to provide an assessment of the potential environmental consequences of adopting the Downtown San Leandro Transit-Oriented Development Strategy (TOD Strategy Plan), which was prepared by the City of San Leandro. (Source: Downtown San Leandro Transit-Oriented Development Strategy, Draft Environmental Impact Report, Kimley-Horn and Associates, Inc., September 5, 2006.)

2.0 EXISTING CONDITIONS

This section describes the existing transportation conditions in the study area for the proposed project, presented in **Figure 1,** p. 2. The existing setting includes descriptions of the roadways and documentation of existing vehicular traffic, local and regional transit service, pedestrian, and bicycle access conditions. This section presents the existing roadway network in the vicinity of the project site, as well as the project study area transit and parking conditions.

2.1 Roadway Network

The following includes a discussion of existing roadways in the vicinity of the proposed project. The functional designation of each roadway was obtained from the *San Leandro 2035 General Plan* and the *TOD Strategy Plan*.

2.1.1 Regional Access

Interstate 880 (I-880) is a north-south freeway serving San Leandro and the East Bay, connecting Oakland to the north and San Jose to the south. The freeway also connects to Interstate 80 (I-80) and Interstate 580 (I-580), which provide connections to San Francisco, the East Bay, and the North Bay. Access to I-880 from the project site is provided via the Davis Street interchange, approximately 1 mile west of the project site.

Interstate 580 (I-580) is an east-west freeway serving San Leandro, the East Bay, and North Bay, connecting San Rafael to the north via the Richmond-San Rafael Bridge and Tracy to the east. The freeway also connects to Interstate 80 (I-80) and Interstate 680 (I-680), which provide connections to San Francisco, the East Bay, and North Bay. Access to I-580 from the project site is provided via the Estudillo Avenue interchange, approximately 1.1 miles east of the project site.

2.1.2 Local Access

The City of San Leandro's roadway system is comprised of freeways, arterials, collectors, and local streets. The *San Leandro 2035 General Plan* defines freeways as limited access multi-lane roadways that accommodate trips from one part of the region to another; arterials as the basic network for through traffic, providing connections between freeways and major destinations, and providing access to collector streets and local streets; collectors as roadways connecting neighborhoods with arterials, typically consisting of two lanes with curb parking in each direction and traffic signals at major intersections; and local streets as low speed roadways that link individual parcels to collector or arterial streets, typically accommodating one lane of traffic and curbside parking in each direction.[4]

Local vehicle, bicycle, and pedestrian access to the proposed project site would be from Chumalia Street from the north, Callan Avenue from the south, East 14th Street from the west, and Hyde Street from the east. Local access is provided by arterial and local roadways in proximity to the project site. Descriptions of these roadways, along with some others, are presented below.

Callan Avenue is an east-west roadway that runs from East 14th Street/Davis Street to Bancroft Avenue. The roadway operates with a single travel lane in each direction. On-street parallel and diagonal parking is permitted intermittently along both sides of the street. The *General Plan* designates Callan Avenue as an arterial street between East 14th Street/Davis Street and Huff Avenue and as a collector street between

[4] Source: https://www.sanleandro.org/civicax/filebank/blobdload.aspx?blobid=26253, accessed June 2018.

Huff Avenue and Bancroft Avenue. The *Downtown San Leandro Transportation-Oriented Development Strategy* identifies Callan Avenue as a Downtown Neighborhood Street.

East 14th Street is a north-south roadway that runs from Interstate 238 (I-238) to Bristol Boulevard. East 14th Street generally operates with two travel lanes in each direction. On-street parallel parking is intermittently provided on both sides of the street. Class II bike lanes run in both directions between Broadmoor Avenue and Chumalia Street. A Class III bike route runs along East 14th Street north of Broadmoor Boulevard. The *General Plan* designates East 14th Street as an arterial street. The *Downtown San Leandro Transportation-Oriented Development Strategy* identifies East 14th Street as a Commercial Main Street.

Davis Street **– State Route 112 (SR 112)** is an east-west arterial roadway that runs from San Francisco Bay to its eastern terminus at East 14th Street/Callan Avenue. Davis Street generally operates with two travel lanes in each direction. On-street parallel parking is permitted along both sides of Davis Street, between Carpentier Street and Hays Street/Dan Niemi Way. Class II bike lanes run along Davis Street in both directions, between Frederick Road/Gilmore Drive and San Leandro Boulevard. The *Downtown San Leandro Transportation-Oriented Development Strategy* identifies Davis Street as an Urban Boulevard between the Union Pacific Railroad (UPRR) Rail alignment and Hays Street / Dan Niemi Way. West of the UPPR Rail alignment, Davis Street is designated as a Vehicular Arterial roadway.

San Leandro Boulevard is a north-south roadway that runs from East 14th Street to West Broadmoor Boulevard where it becomes San Leandro Street. The roadway operates with one or two travel lanes in each direction. San Leandro Boulevard is identified as an arterial street in the *General Plan* and as an Urban Boulevard in the *Downtown San Leandro Transportation-Oriented Development Strategy*. Class II bike lanes run along San Leandro Boulevard from San Leandro Creek to Williams Street. Class II buffered bike lanes are also provided along San Leandro between San Leandro Creek and Broadmoor Boulevard and between Williams Street and Hudson Lane.

Estudillo Avenue is an east-west roadway that runs from East 14th Street to its eastern terminus at Chabot Park. The roadway operates with a single travel lane in each direction. On-Street parallel parking is intermittently permitted on both sides of the street. Class II bike lanes run in both directions between East 14th Street and I-580. A Class III bike route runs along Estudillo Avenue between I-580 and its eastern terminus at Chabot Park. The *General Plan* identifies Estudillo Avenue as a Collector Street between East 14th Street and Huff Avenue and as an Arterial Street between Huff Avenue and I-580. The *Downtown San Leandro Transportation-Oriented Development Strategy* identifies Estudillo Avenue as a Downtown Neighborhood Street between East 14th Street and Santa Rosa Street.

Chumalia Street is an east-west road that runs from East 14th Street to its eastern terminus approximately 275 feet east of Jefferson Street. The roadway operates with a single travel lane in each direction. On-street parallel parking is provided along both sides of the street. There are no bicycle facilities on the roadway. The *General Plan* identifies Chumalia Street as a local street.

Dan Niemi Way is a road that runs for about 525 feet, between Davis Street and East 14th Street. The roadway operates with a single travel lane in each direction. On-street parking is prohibited and there are no bicycle facilities on the roadway. The *General Plan* identifies Dan Niemi Way as a local street.

Hyde Street is a north-south roadway that runs for approximately 550 feet from Callan Avenue to its terminus just north of Chumalia Street. Between Callan Avenue and Chumalia Street, Hyde Street operates as a one-way street in the northbound direction, with diagonal parking provided on both sides of the

street. North of Chumalia Street, Hyde operates two-way with a single travel lane in each direction and on-street parallel parking permitted on both sides of the roadway. There are currently no bicycle facilities provided on Hyde Street. The *General Plan* identifies Hyde Street as a local street.

Bancroft Avenue is a north-south road that runs from 42nd Avenue in Oakland to East 14th Street in San Leandro. Near the project site, the roadway operates with a single travel lane in each direction. On-street parallel parking is intermittently permitted on both sides of the street and Class II bike lanes run in both directions. The *General Plan* identifies Bancroft Avenue as an arterial street.

Hays Street is a north-south road that runs approximately 0.5 miles from Castro Street to Davis Street. The roadway operates with a single travel lane in each direction. On-street parallel parking is intermittently provided along both sides of the street and there are no bicycle facilities on the roadway. The *General Plan* identifies Hays Street as a local street.

2.2 Intersection Traffic Volumes

A total of five intersections were counted on Thursday, October 4, 2018 during the AM (7:00 a.m. to 9:00 a.m.) and PM (4:00 p.m. to 6:00 p.m.) peak periods for the purposes of this study; these intersections and their traffic controls are listed below. These counts were collected during a temporary stoppage in East Bay Bus Rapid Transit (BRT) construction work, in which all work area travel lanes were open to traffic. Collected vehicle, bicycle, and pedestrian volumes for the weekday AM and PM peak period are presented in **Appendix A**.

1. East 14th Street/Davis Street/Callan Avenue (Signal)
2. East 14th Street/Estudillo Avenue/Washington Plaza entrance (Signal)
3. East 14th Street/Chumalia Street/Dan Niemi Way (Signal)
4. Davis Street/Dan Niemi Way/Hays Street (Signal)
5. Callan Avenue/Bancroft Avenue (Signal)

Figure 3 presents the lane configurations, and **Figure 4** presents the existing weekday AM and PM peak hour vehicle turning movements for the study intersections.

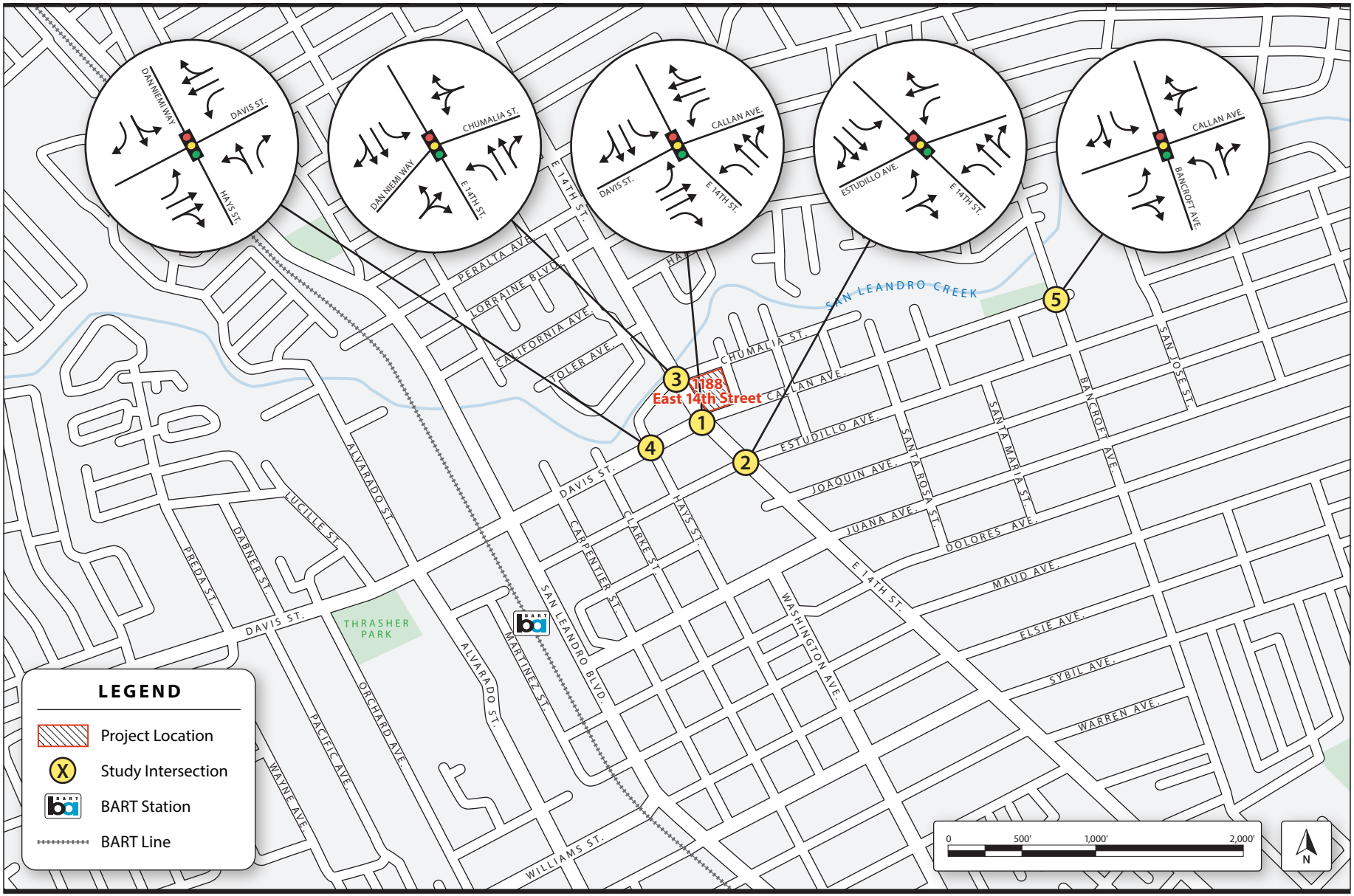

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Figure 3
Existing Intersection Lane Configurations and Traffic Controls

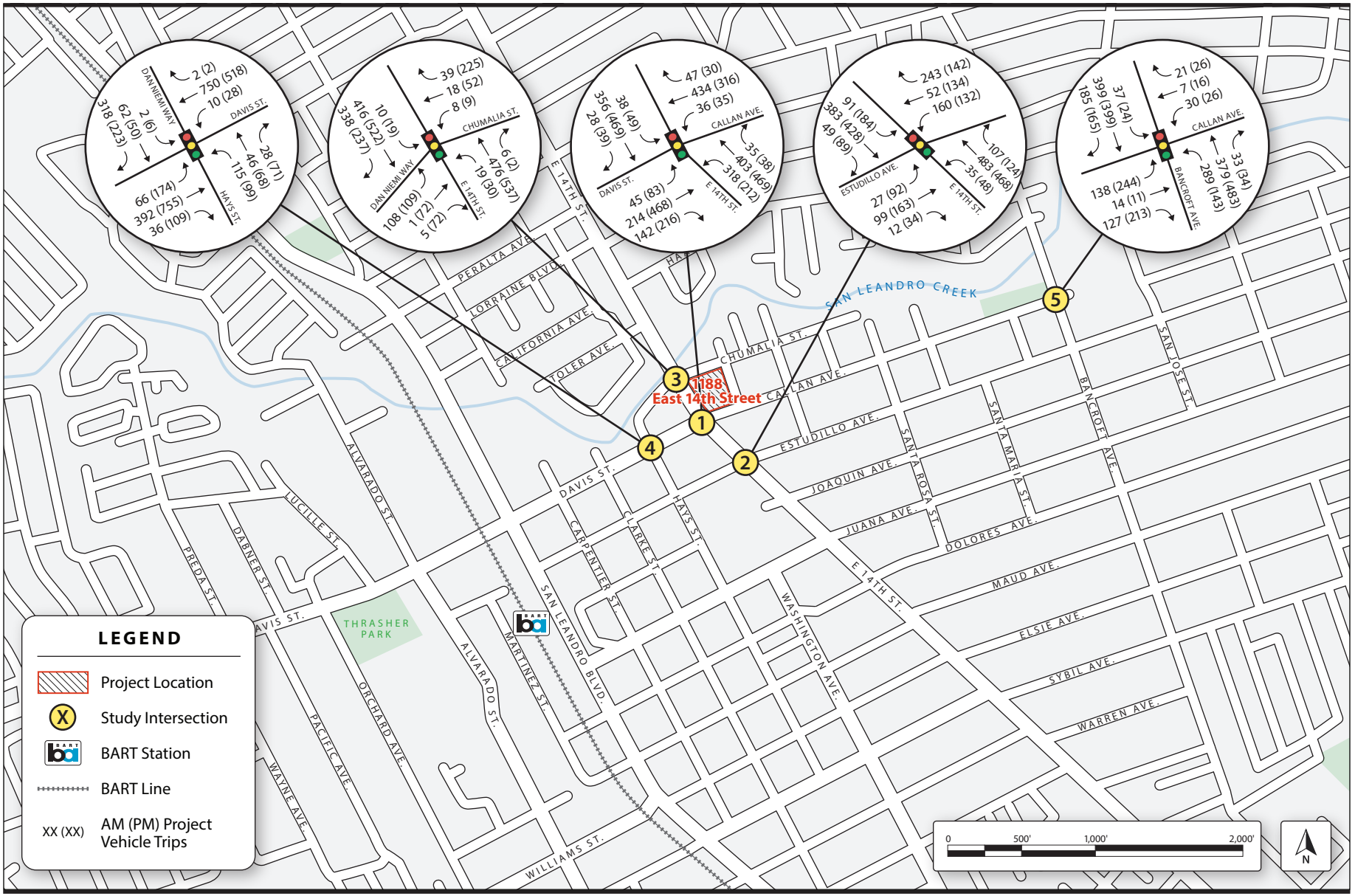

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Figure 4
Existing Peak Hour Traffic Volumes

2.3 Level of Service Analysis – Existing Conditions

Traffic operational level of service (LOS) conditions were evaluated for traffic during weekday AM (7:00 to 9:00 AM) and PM (4:00 to 6:00 PM) peak periods. LOS is a qualitative description of an intersection's performance based on the average delay per vehicle. Intersection LOS range from LOS A, which indicates free flow conditions with minimal delays, to LOS F, which indicates congested conditions with considerably long delays. The City of San Leandro considers LOS D to be the minimum acceptable service level for intersections located outside of Priority Development Areas (PDAs). For intersections located within PDAs, the acceptable level of service is LOS E. Study intersections located within PDAs include the intersection of Davis Street and Callan Avenue at East 14th Street, Estudillo Avenue and East 14th Street, Dan Niemi Way and Hays Street at Davis Street, and Chumalia Street and Dan Niemi Way at East 14th Street. It should also be noted that Davis Street and East 14th Street are under California Department of Transportation (Caltrans) jurisdiction.

The study intersections were evaluated using the *2000 Highway Capacity Manual* operations methodology, consistent with the *2035 General Plan Update DEIR, TOD Strategy DEIR,* and recent development studies within the City. This method determines the capacity for each directional approach to an intersection. LOS is calculated based on the average stopped delay per vehicle (seconds per vehicle) for the various approaches at the intersection. For signalized intersections, CHS additionally incorporated current Caltrans signal timing cards into the analysis for both peak periods.

Table 1 presents the LOS and delay analysis results for the study intersections during the weekday AM and PM peak hours under Existing Conditions. Existing intersection turning movement count data are provided in **Appendix A,** and Existing Conditions intersection LOS calculations are provided in **Appendix B**. As shown in **Table 1**, all of the study intersections are currently operating within City LOS standards of LOS D or better under Existing Conditions.

Table 1 – Existing Conditions: Peak Hour Intersection Level of Service Results

Existing Conditions		Control Type	AM Peak Hour		PM Peak Hour	
ID	Intersection		Delay[2]	LOS[3]	Delay[2]	LOS[3]
1	East 14th Street/Davis Street/Callan Avenue[1]	Signal	26.3	C	24.4	C
2	East 14th Street/Estudillo Avenue/Washington Plaza Entrance[1]	Signal	14.4	B	21.0	C
3	East 14th Street/Chumalia Street/Dan Niemi Way[1]	Signal	7.4	A	19.8	B
4	Davis Street/Dan Niemi Way/Hays Street[1]	Signal	21.1	C	22.1	C
5	Callan Avenue/Bancroft Avenue	Signal	35.1	D	19.6	B

Source: CHS Consulting Group, 2020.

Notes:

1. Intersection is located within a Priority Development Area (PDA) where LOS E is the minimum acceptable service level.
2. Delay reported as seconds per vehicle. For signalized and all-way stop controlled intersections, a weighted average delay and level of service (LOS) based on all intersection approaches is reported. For unsignalized intersections (1-way and 2-way stop controlled), delay and LOS for the worst stop-controlled approach is reported.
3. LOS = Level of Service

2.4 95th Percentile Queue Length Analysis – Existing Conditions

As part of the LOS analysis, peak hour 95th percentile queue lengths were analyzed and compared with the existing storage capacity of exclusive left- and right-turn lanes at study intersections where proposed

project-generated traffic is expected to be added. Peak hour 95th percentile queue lengths were analyzed at the following locations:

East 14th Street at Davis Street and Callan Avenue
- Northbound left-turn lane
- Eastbound left-turn lane
- Westbound left-turn lane

East 14th Street at Estudillo Avenue
- Eastbound left-turn lane
- Southbound left-turn lane
- Westbound left-turn lane

East 14th Street at Dan Niemi Way and Chumalia Street
- Southbound left-turn lane

Davis Street at Hays Street / Dan Niemi Way
- Southbound left-turn lane

Bancroft Avenue at Callan Avenue
- Eastbound left-turn lane
- Northbound left-turn lane

Existing AM and PM peak hour intersection queue analysis results are summarized in **Table 2**.

Table 2 – Existing Conditions: Peak Hour Intersection Queue Analysis Results

Intersection	Turn Pocket	Storage Capacity	95th Percentile Queue (feet) AM Peak Hour	95th Percentile Queue (feet) PM Peak Hour
East 14th St. / Davis St. / Callan Ave.	NBL	100	**277**	**181**
	EBL	160	56	77
	WBL	60	42	39
East 14th St./ Estudillo Ave.	EBL	80	35	**129**
	SBL	80	11	**82**
	WBL	120	**152**	**131**
East 14th St. / Dan Niemi Way / Chumalia St.	SBL	75	7	17
Davis St. / Hays St. / Dan Niemi Way	SBR	90	**126**	64
Bancroft Ave./ Callan Ave.	EBL	240	121	229
	NBL	95	**263**	54

Source: CHS Consulting Group, 2020.

Notes:
1. **Bold** text indicates 95th percentile queue length exceeds existing turn pocket capacity.
2. NBL = northbound-left, EBL = eastbound-left, WBL = westbound-left, SBL = southbound-left, SBR = southbound-right.

As shown in **Table 2**, under Existing Conditions, the 95th percentile queue length at the northbound left-turn pocket at East 14th Street / Davis Street / Callan Avenue, the westbound left-turn pocket at East 14th Street / Estudillo Avenue, the southbound right-turn pocket at East 14th Street / Dan Niemi Way / Chumalia Street, and the northbound left-turn pocket at Bancroft Avenue / Callan Avenue exceed storage capacity during the AM peak hour. During the PM peak hour, the 95th percentile queue length at the northbound left-turn pocket at East 14th Street / Davis Street / Callan Avenue; the eastbound left-turn

pocket, southbound left-turn pocket, and westbound left-turn pocket at East 14th Street / Estudillo Avenue exceed existing storage capacity, under Existing Conditions.

2.5 Vehicle Miles Traveled (VMT)

Vehicle miles traveled (VMT) is a measurement of miles traveled by vehicles within a specified region over a specified time period.[5] The City of San Leandro is in the process of adopting VMT as its California Environmental Quality Act (CEQA) metric for transportation impacts, as mandated by Senate Bill 743 (SB 743). Effective July 1, 2020, SB 743 requires all CEQA lead agencies to establish VMT as the metric replacing LOS for evaluating CEQA traffic and transportation impacts. VMT thresholds consistent with SB 743 guidance from the Governor's Office of Planning and Research (OPR) establish that a project that is substantially similar to other surrounding land uses and located in a TAZ generating VMT per capita at least 15 percent below regional averages would have a less than significant impact.[6]

CHS used the Metropolitan Transportation Commission (MTC) Regional Travel Model, which estimates average daily VMT per capita for residents and employees within each transportation analysis zone (TAZ). For purposes of this study, CHS consulted this model to determine VMT for the TAZ in which the proposed project is located, TAZ 871.

As shown in **Table 3**, TAZ 871 has an average employee VMT of 21.36 miles per employee, which is approximately nine percent above the regional average minus 15 percent VMT threshold of 19.64 miles per employee. The average resident VMT for TAZ 871 is 10.35 miles per capita, which is approximately 18 percent below the regional average minus 15 percent VMT threshold of 12.64 miles per capita.

Table 3 – Existing Conditions: Vehicle Miles Traveled (VMT) per Capita

Type	2020 MTC Regional Travel Model Estimates		TAZ 871
	Regional Average	Regional Average minus 15%	
Employee	23.11	19.64	21.36
Resident	14.88	12.64	10.35

Source: Metropolitan Transportation Commission (MTC); CHS Consulting Group, 2020

2.6 Transit Network

The study area for transit generally covers a quarter-mile radius from the project site. The project site is served by local public transit service provided by Alameda-Contra Costa Transit (AC Transit), as well as regional BART rail service. **Figure 5**, p.15, presents the transit lines in the study area and the bus stops within the study area boundary.

2.6.1 Alameda-Contra Costa Transit (AC Transit)

AC Transit operates bus lines within 13 cities and adjacent unincorporated areas in Alameda and Contra Costa County, as well as connecting Transbay to and from San Francisco. There are five bus routes located within a quarter-mile radius from the project site.

[5] Source: Alameda County Congestion Management Program, September 2019
[6] Source: Technical Advisory on Evaluating Transportation Impacts in CEQA, December 2018.

Route 1T (Tempo) provides BRT service connecting major destinations throughout Oakland and San Leandro and provides transfer connections to additional local and regional transit services. The BRT route operates predominantly in a dedicated bus-only lane, uses transit signal technology to improve travel times and reliability along the corridor, and uses a new fleet of hybrid-electric buses. The route operates two-way service 24-hours per day with 10-minute headways. Major destinations served by Route 1T include the San Leandro BART Station, Durant Square, Fruitvale BART Station, Laney College, and 19th Street BART Station (Uptown Transit Center). In the vicinity of the project site, this route stops on Davis Street, between Hays Street/Dan Niemi Way and East 14th Street, approximately 500 feet west of the project site.

Route 10 provides service connecting major destinations throughout San Leandro and Hayward and provides transfer connections to additional local and regional transit services. Route 34 operates two-way service with 15-minute headways between 5:29 a.m. and 12:32 a.m. Major destinations served by Route 10 include the San Leandro BART Station, Pelton Center, San Leandro Hospital, Bay Fair BART Station, and Hayward BART Station.

Route 34 provides service connecting major destinations throughout Oakland, San Leandro, San Lorenzo, Cherryland, and Hayward and provides transfer connections to additional local and regional transit services. Route 34 operates two-way service with 30-minute headways between 6:28 a.m. and 10:46 p.m. Major destinations served by Route 34 include Foothill Square Shopping Center, the San Leandro BART Station, West Gate Shopping Center, Kaiser Permanente Medical Center, and Hayward BART Station.

Route 35 provides service connecting major destinations throughout Oakland and San Leandro and provides transfer connections to additional local and regional transit services. Route 35 operates two-way service with 30 minute headways between 6:13 a.m. and 10:28 p.m. Major destinations served by Route 35 include Foothill Square Shopping Center, the San Leandro BART Station, Westgate Shopping Center, the San Leandro Marina, Marina Community Center, Greenhouse Marketplace, and the Bayfair BART Station.

Route 801 provides service connecting major destinations throughout Fremont, Union City, Hayward, San Leandro, and Oakland and provides transfer connections to additional local and regional transit services. Route 35 operates an all-nighter two-way service with 1 hour headways between 12:50 a.m. and 5:50 a.m. Major destinations served by Route 35 include the Fremont BART Station, the Union City BART Station, the South Hayward BART station, the Hayward BART Station, the Bay Fair BART Station, the San Leandro BART Station, the 12th Street Oakland City Center BART Station, and downtown Oakland.

The following stops are within walking distance of the project site:

- Davis Street and Dan Niemi Way (375 feet west of the project site)
- Davis Street and Hays Street (400 feet west of the project site)
- Davis Street and Clarke Street (670 feet west of the project site)
- Hays Street and Davis Street (560 feet southwest of the project site)
- Hays Street and Estudillo Avenue (680 feet southwest of the project site)
- East 14th Street and Toler Avenue (650 feet north of the project site)
- East 14th Street and Haas Avenue (1,160 feet north of the project site)

- East 14th Street and Lorraine Boulevard (1,300 feet north of the project site)
- East 14th Street and Estudillo Avenue (340 feet south of the project site)
- Estudillo Avenue and East 14th Street (770 feet southeast of the project site)
- East 14th Street and Joaquin Avenue (880 feet southeast of the project site)
- Estudillo Avenue at the San Leandro Community Library (1,080 feet southeast of the project site)
- East 14th Street at West Juana Avenue (1,220 feet south of the project site)

Table 4 presents the headways, hours of operation, and location of the nearest stop to the project site for each route.

Table 4 – Local AC Transit Routes

Route	Direction[1]	Weekday Headways[2]		Hours of Operation	Nearest Stop Location	Distance to Project Site (feet)[3]
		AM Peak	PM Peak			
1T	IB	10	10	24-hour	Davis St. and Hays St.	400
	OB	10	10	24-hour	Davis St. and Dan Niemi Way	375
10	IB	15	15	5:29a.m. - 12:32a.m.	Davis St. and Clarke St.	670
	OB	15	15	5:13a.m. – 11:58p.m.	East 14th St and Estudillo Ave.	340
34	IB	30	30	6:46a.m. – 10:46p.m.	East 14th St. and Estudillo Ave.	340
	OB	30	30	6:28a.m. – 10:28p.m.	Hays St. and Davis St.	560
35	IB	30	30	6:28a.m. – 10:28p.m.	Hays St. and Estudillo Ave.	680
	OB	30	30	6:13a.m. – 10:13p.m.	Hays St. and Davis St.	560
801	IB	60	60	12:50a.m. – 5:50a.m.	East 14th St. and Joaquin Ave.	880
	OB	60	60	12:12a.m. – 5:12a.m.	East 14th St. and Estudillo Ave.	340

Source: AC Transit, 2018; CHS Consulting, 2020

Notes:

1. IB = Inbound; OB = Outbound
2. Headways in minutes. AM peak = 7:00 AM to 9:00 AM and PM peak = 4:00 PM to 6:00 PM
3. Distances are approximate and are measured from the nearest proposed project pedestrian entrance at the project site along local streets to reach the nearest transit stop.

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Figure 5
Existing Transit Network

2.6.2 Bay Area Rapid Transit (BART)

BART provides regional commuter rail service between the East Bay (from Pittsburg/Bay Point, Richmond, Dublin/Pleasanton and Fremont), San Mateo County (from San Francisco International Airport and Millbrae), and San Francisco, with operating hours between 4:00 a.m. and midnight on weekdays, and 7:30 a.m. to 1:00 a.m. on weekends. Within San Leandro, BART operates in a viaduct above street level and runs north to south. During the weekday a.m. and p.m. peak periods, headways are generally 5 to 15 minutes for each line. The San Leandro BART Station is accessible from the project site (approximately 0.4 miles southwest of the project site) or can be accessed via transfer from AC Transit Routes 1, 10, 34, 35 and 801. The San Leandro BART Station also provides connections to the future East Bay BRT.

2.7 Pedestrian Conditions

Pedestrian amenities generally include sidewalks, crosswalks, curb ramps, pedestrian signals, and streetscape and landscape amenities (i.e., benches, tree-lined buffers, planters, bulb-outs, street lighting, etc.). Sidewalks in the area are generally between 6 and 10 feet wide. ADA-compliant curb ramps are defined as those with truncated domes. Curb ramps identified below are generally without truncated domes unless otherwise noted.

The intersection of East 14th Street and Davis Street at Callan Avenue provides clear crosswalk markings at all four legs and ADA-compliant curb ramps at all four corners. The intersection is signal controlled and includes pedestrian signal heads and push buttons. Sidewalks along Davis Street are generally 8 feet wide.

The intersection of East 14th Street and Estudillo Avenue provides clear crosswalk markings at all four legs and ADA-compliant curb ramps at all four corners. The intersection is signal controlled and includes pedestrian signal heads and push buttons. Sidewalks along East 14th Street are generally 8 feet wide.

The intersection of East 14th Street and Chumalia Street / Dan Niemi Way provides standard crosswalk markings and ADA-compliant curb ramps at all four corners. However, it is recommended that these crosswalks be upgraded to high-visibility "ladder" style markings for improved pedestrian safety, as per Caltrans Standard Plan A24F.[7] The intersection is signal controlled and includes pedestrian signal heads and push buttons. Sidewalks along Chumalia Street are generally 8 feet wide.

The intersection of Davis Street and Dan Niemi Way/Hays Street provides crosswalk markings at all four legs and ADA-compliant curb ramps at all four corners. However, it is recommended that these crosswalks be upgraded to high-visibility "ladder" style markings for improved pedestrian safety, as per Caltrans Standard Plan A24F. The intersection is signal controlled and includes pedestrian signal heads and push buttons. However, these pedestrian push buttons are non-compliant and it is recommended that they be replaced with Accessible Pedestrian Signal (APS) push buttons. Sidewalks along Dan Niemi Way and Hays Street are generally 8 feet wide.

The intersection of Callan and Bancroft Avenues provides clearly defined yellow crosswalk markings at the northern and western legs and ADA-compliant curb ramps at the northeastern, northwestern, and southwestern corners. The intersection is signal controlled and includes pedestrian signal heads and push buttons. Sidewalks along Bancroft Avenue are generally 10 feet wide.

[7] Caltrans Standard Plan A24F: http://ppmoe.dot.ca.gov/hq/esc/oe/project_plans/Errata/Errata-2010/2010_StdPln_Errata_No.4/rspa24f.pdf

Pedestrian improvements are currently planned in the vicinity of the project site as part of the East Bay Greenway. The East Bay Greenway would create a 16-mile regional trail facility that connects Oakland, San Leandro, and Hayward via Class I Shared Use Paths and Class IV protected bikeways that would follow the BART rail alignment. The East Bay Greenway would run in a north-south direction approximately 0.34 miles (1,800 feet) west of the project site, accessible via Davis Street. Additionally, the planned San Leandro Creek Trail would provide new pedestrian improvements adjacent to the project site along San Leandro Creek, East 14th Street, and Callan Avenue.

In support of the qualitative evaluation of pedestrian traffic in and around the project site, CHS collected pedestrian counts at crosswalks at each study intersection on Thursday, October 4th, 2018 during the AM peak (7:00 a.m. to 9:00 a.m.) and PM peak (4:00 p.m. to 6:00 p.m.) periods (see **Appendix A**). The highest concentration of pedestrian activity in the study area was observed at the intersection of Bancroft Avenue and Callan Avenue during the AM peak hour (between 7:15 and 8:15 a.m.) and at the intersection of Estudillo Avenue and East 14th Street during the PM peak hour (between 4:00 and 5:00 p.m.). **Table 5** summarizes existing pedestrian counts at the five study intersections during the weekday AM and PM peak hours.

Table 5 – Existing Peak Hour Intersection Pedestrian Crossings

Intersection	North Leg	East Leg	South Leg	West Leg
1. Davis Street/Callan Avenue at East 14th Street (Signalized)	7 (5)	17 (20)	27 (27)	33 (22)
2. Estudillo Avenue at East 14th Street (Signalized)	39 (75)	9 (29)	11 (24)	11 (20)
3. Chumalia Street/Dan Niemi Way at East 14th Street (Signalized)	0 (0)[2]	28 (0)	9 (0)	36 (0)
4. Davis Street at Dan Niemi Way/Hays Street (Signalized)	16 (15)	14 (22)	13 (30)	21 (18)
5. Bancroft Avenue at Callan Avenue (Signalized)	164 (61)	70 (9)	2 (3)	52 (47)

Source: CHS Consulting Group, 2020.
Notes:
1. Pedestrian counts are for AM (PM) Peak Hour.
2. Pedestrian crossings at these legs are prohibited

2.8 Bicycle Conditions

Bicycle facilities include bicycle lanes, trails, and paths, as well as bicycle parking, bicycle lockers, and showers for cyclists. On-street bicycle facilities include Class I bikeways (trails or shared-use paths with exclusive right-of-way for use by bicyclists or pedestrians); Class II bikeways (bicycle lanes striped within the paved areas of roadways and established for the preferential use of bicycles); Class III bikeways (signed bicycle routes that allow bicycles to share travel lanes with vehicles); and Class IV separated bikeways (on-street bike facilities that are physically separated from traffic by curbs, plant boxes, bollards, grade separation, or parked cars for exclusive right-of-way for use by bicyclists). **Figure 6**, p. 21, presents the location of bikeways near the project site.

Existing Bikeways

According to the San Leandro Bicycle and Pedestrian Master Plan, San Leandro currently has approximately 43.4 miles of bikeways including 5.2 miles of Class I bikeways, 23.2 miles of Class II bike lanes, 1.3 miles of Class II buffered bike lanes, and 13.7 miles of Class III bike routes.[8]

[8] Source: *San Leandro Bicycle and Pedestrian Master Plan 2018 Update,* City of San Leandro, March 2018.

In proximity to the project site, there are Class II bike lanes along Estudillo Avenue, Bancroft Avenue, East 14th Street north of Chumalia Street and Dan Niemi Way, and San Leandro Boulevard. Class III bicycle facilities are provided along Juana Avenue, Washington Avenue, and Dutton Avenue.

In support of the qualitative evaluation of bicycle traffic in and around the project site, CHS collected bicycle counts at the five study intersections on Thursday, October 4th, 2018 (see **Appendix A**). **Table 6** summarizes existing bicycle counts at the five study intersections during the AM and PM peak hours.

As summarized in **Table 6**, there is generally a low level of existing bicycle traffic at study intersections. The highest levels of bicycle traffic during both the AM peak hour and PM peak hour periods were observed at the intersection of Bancroft Avenue at Callan Avenue.

Table 6 – Existing Peak Hour Intersection Bicycle Crossings

Intersection	Intersection Approach			
	NB	SB	EB	WB
1. Davis Street/Callan Avenue at East 14th Street (Signalized)	0 (11)	4 (3)	3 (4)	1 (2)
2. Estudillo Avenue at East 14th Street (Signalized)	1 (4)	5 (5)	5 (11)	8 (7)
3. East 14th Street at Chumalia Street/Dan Niemi Way (Signalized)	1 (0)	9 (0)	2 (0)	2 (0)
4. Davis Street at Dan Niemi Way/Hays Street (Signalized)	2 (7)	6 (0)	2 (2)	1 (2)
5. Bancroft Avenue at Callan Avenue (Signalized)	5 (27)	17 (8)	8 (7)	0 (7)

Source: CHS Consulting Group, 2020.
Note: Bicycle counts are for AM (PM) Peak Hour.

Future Bikeway Improvements

In terms of future bikeways, the *City of San Leandro Bicycle and Pedestrian Master Plan*[9] proposes an additional 41.2 miles of bicycle facilities that would increase the system wide total mileage of bikeways to 84.6 miles.

The East Bay Greenway is a proposed bikeway that would create a 16-mile regional trail facility that connects Oakland, San Leandro, and Hayward via Class I Shared Use Paths and Class IV protected bikeways that would follow the BART rail alignment. The East Bay Greenway would run in a north-south direction approximately 0.4 miles west of the project site, accessible via Davis Street.

The San Leandro Creek project would add a combination of Class I, Class II, Class III, and Class IV bikeways that generally follow along San Leandro Creek, between Hegenberger Road in Oakland and Chabot Park in San Leandro. In the vicinity of the project site, the recommended route would run from west to east along San Leandro Creek from San Leandro Boulevard to East 14th Street, as a Class I bikeway. The San Leandro Creek Trail would run along East 14th Street from San Leandro Creek to Davis Street, as Class II bike lanes. Along East 14th Street, between Davis Street and Estudillo Avenue and continuing east along Estudillo Avenue to Bancroft Avenue, the San Leandro Creek Trail would operate as a Class IV separated bikeway. The long-term solution/alternative route would run along a similar path as the recommended route, but would consist of Class II bike lanes along Callan Avenue, between East 14th Street and Huff Avenue; in place of a Class IV separated bikeway along Estudillo Avenue, between East 14th Street and Grand Avenue. *The City of San Leandro Bicycle and Pedestrian Master Plan Update* also makes recommendations for future bikeways in the vicinity of the project site. A Class I shared-use path is recommended along San Leandro Creek, between the Union Pacific Railroad Niles Subdivision in Oakland

[9] Source: *San Leandro Bicycle and Pedestrian Master Plan 2018 Update,* City of San Leandro, March 2018.

and East 14th Street. Class II bike lanes are recommended along East 14th Street, between Chumalia Street and Estudillo Avenue.

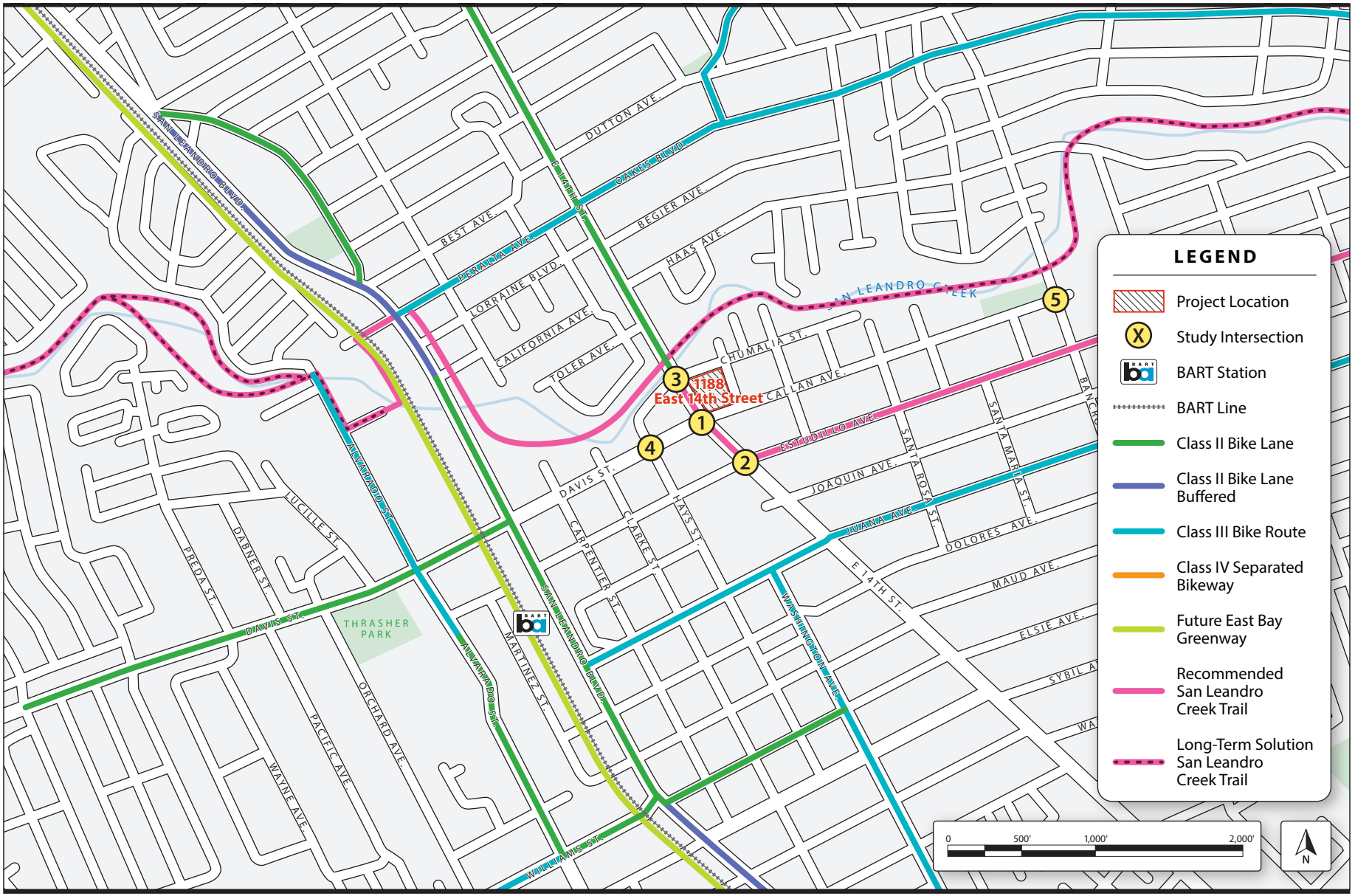
Additionally, Bancroft Avenue, between Durant Avenue and East 14th Street; Davis Street, between East 14th Street and Oyster Bay Park; Estudillo Avenue, between East 14th Street and Lake Chabot Park; and East 14th Street, between San Leandro Creek to the city limits of Ashland, are part of the *City of San Leandro Bicycle and Pedestrian Master Plan Update* study corridors that require additional study before bikeway improvements can be made. As part of the study corridors, Bancroft Avenue, Davis Street, and Estudillo Avenue are being studied for implementation of a Class IV separated bikeway, while East 14th Street will require a Complete Street study to determine the feasibility of implementing bicycle facilities in conjunction with the East Bay BRT that will run along East 14th Street.

Recommendations for Bikeway Improvements

Based on this review of existing bicycle conditions in the study area, there is currently a lack of bicycle facilities in Downtown San Leandro, especially between the project site and the San Leandro BART Station. It is anticipated that residents and visitors who would cycle to and from the Project would use Chumalia Street to access the site, due to lower traffic volumes compared with East 14th Street and Callan Avenue/Davis Street. Therefore, it is recommended that the feasibility of implementing Class II bike lanes along Dan Niemi Way (between East 14th Street and Davis Street) and on Chumalia Street (Between East 14th Street and Hyde Street), be further studied to provide a safe and convenient bicycle route between the project site and the San Leandro BART Station.

Dan Niemi Way is approximately 40-feet-wide with a 20-foot-wide travel lane in each direction and no on-street parking permitted. Therefore, Dan Niemi Way could generally accommodate a 6-foot-wide Class II bike lane and a single 14-foot-wide travel lane in each direction. However, further design review would be required to accommodate the dedicated southbound right-turn lane at the Dan Niemi Way/Davis Street/Hays Street intersection and additional analysis would be required to assess the safety of a bike route, as Dan Niemi Way currently has five (5) driveway curb cuts where bicyclists would come into conflict with vehicles entering/exiting adjacent off-street parking lots.

Chumalia Street is approximately 40-feet-wide with a 20-foot-wide travel lane in each direction and on-street parallel parking permitted on both sides of the street. Therefore, Chumalia Street would not be suited to accommodate 6-foot-wide Class II bike lanes without the removal of on-street parking. However, if on-street parking were prohibited along at least one side of the street, Chumalia Street could accommodate a 6-foot-wide Class II bike lane and 10.5-foot-wide travel lane in each direction. Alternatively, due to Chumalia Street's lower traffic volumes, a Class III bike route may also be considered for Chumalia Street that would not require the removal of on-street parking.



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Consulting Group

Figure 6
Existing Bicycle Network

3.0 EXISTING PLUS APPROVED PROJECT (BASELINE) CONDITIONS

This section analyzes near-term Baseline Conditions, defined as the addition of traffic from nearby City-approved and pending developments to Existing Conditions. The approved developments are within an approximately one-mile radius of the proposed project site and thus would be expected to add traffic to the study intersections. Approved projects consist of developments that are under construction, built but not occupied, or are not built but have final development approval and a construction permit issued by the City of San Leandro as of October 24, 2018. Based on communication with City of San Leandro staff, the one project in the area that meets these criteria is the La Vereda Project at 528 West Juana Avenue, consisting of 85 affordable senior housing units. This project would be expected to generate additional near-term traffic through the study intersections.

Under Baseline Conditions for purposes of this study, it is assumed that the local transportation network, including the study intersection traffic controls and lane geometry, would remain the same as Existing Conditions. **Figure 7** presents the location of the approved project, **Figure 8** presents the total peak hour vehicle trips for the approved project assigned to the study intersections, and **Figure 9** presents the Existing plus Approved Project (Baseline) peak hour traffic volumes resulting from the addition of approved project trips to Existing Conditions.

3.1 Approved Project Trip Generation and Distribution

Vehicular trip generation for La Vereda was calculated using the *TOD Strategy DEIR* trip generation rates, given the approved project is consistent with the *TOD Strategy Plan*. Trip distribution and assignment for La Vereda were based on the distribution of existing traffic counts at project study intersections. It should also be noted that most of the vehicle trips generated by La Vereda would be distributed to intersections outside of the project study area and thus only a small proportion are represented at study intersections. **Table 7** presents land use, size, and estimated vehicular trip generation for the approved project.

Table 7 - Approved Project: Vehicular Trip Generation

Project Name	Land Use	Size	Trip Rate	Weekday Trips	AM Peak Hour			PM Peak Hour		
					Total	In	Out	Total	In	Out
La Vereda	Residential	85 units	3.09	263	20	3	16	23	15	8

Source: TOD Strategy DEIR trip generation rates for BART Area Residential Condominium/Townhouse. *Downtown San Leandro TOD Strategy Draft Environmental Impact Report – Parking & Traffic Analysis of Land Use Alternatives, September 5, 2006*.

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Figure 7
Approved Project Location

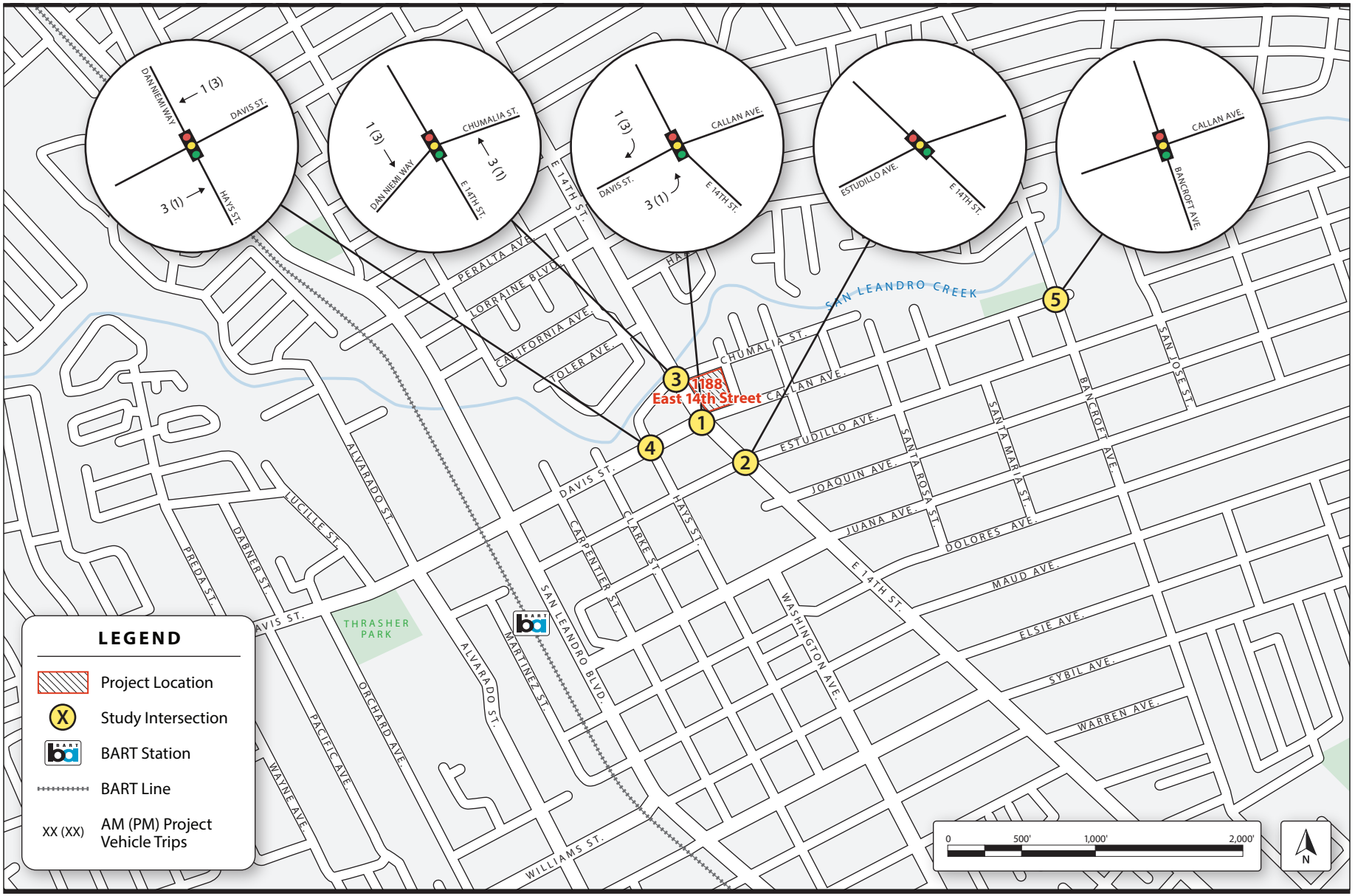

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Figure 8
Approved Project Trip Assignments

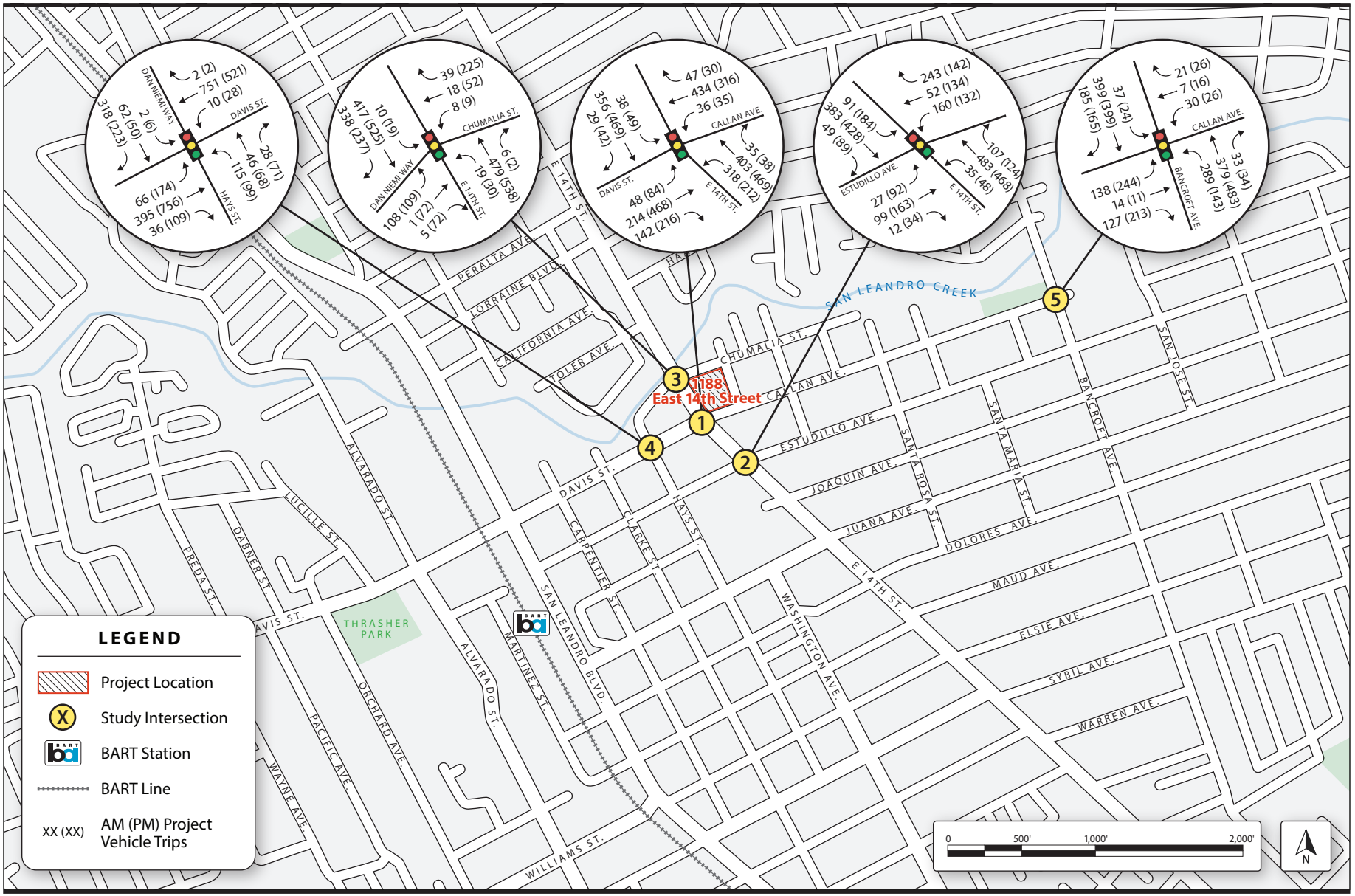

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Figure 9
Baseline Peak Hour Traffic Volumes

3.2 Level of Service Analysis – Existing plus Approved (Baseline) Conditions

Table 8 presents the LOS and delay analysis results for the study intersections during the weekday AM and PM peak hours under Existing plus Approved (Baseline) Conditions. Existing plus Approved (Baseline) Conditions intersection LOS calculations are provided in **Appendix C**.

Table 8 – Baseline Conditions: Peak Hour Intersection Level of Service Results

ID	Intersection	Control Type	AM Peak Hour		PM Peak Hour	
			Delay[2]	LOS[3]	Delay[2]	LOS[3]
1	East 14th Street/Davis Street/Callan Avenue[1]	Signal	26.3	C	24.4	C
2	East 14th Street/Estudillo Avenue[1]	Signal	14.5	B	21.0	C
3	East 14th Street/Chumalia Street/Dan Niemi Way[1]	Signal	7.5	A	19.8	B
4	Davis Street/Dan Niemi Way/Hays Street[1]	Signal	21.1	C	22.1	C
5	Callan Avenue/Bancroft Avenue	Signal	35.1	D	19.6	B

Source: CHS Consulting Group, 2020.

Notes:

1. Intersection is located within a Priority Development Area (PDA) where LOS E is the minimum acceptable service level.
2. Delay reported as seconds per vehicle. For signalized and all-way stop controlled intersections, a weighted average delay and level of service (LOS) based on all intersection approaches is reported. For unsignalized intersections (1-way and 2-way stop controlled), delay and LOS for the worst stop-controlled approach is reported.
3. LOS = Level of Service

As shown in **Table 8**, all of the study intersections would continue to operate within City LOS standards of LOS D or better under Existing plus Approved (Baseline) Conditions. Although average delays increase slightly at some study intersections compared to Existing Conditions, all study intersections are expected to maintain the same LOS as Existing Conditions.

3.3 95th Percentile Queue Length Analysis – Baseline Conditions

As part of the LOS analysis under Existing plus Approved Project (Baseline) Conditions, peak hour 95th percentile queue lengths were analyzed and compared with the existing storage capacity of exclusive left- and right-turn lanes at study intersections where proposed project-generated traffic is expected to be added. Baseline Peak Hour intersection queue analysis results are summarized in **Table 9**.

As shown in **Table 9**, under Existing plus Approved Project (Baseline) Conditions, the 95th percentile queue length at the northbound left-turn pocket at East 14th Street / Davis Street / Callan Avenue, the westbound left-turn pocket at East 14th Street / Estudillo Avenue, the southbound right-turn pocket at East 14th Street / Dan Niemi Way / Chumalia Street, and the northbound left-turn pocket at Bancroft Avenue / Callan Avenue would continue to exceed storage capacity during the AM peak hour. During the PM peak hour, the 95th percentile queue length at the northbound left-turn pocket at East 14th Street / Davis Street / Callan Avenue; the eastbound left-turn pocket, southbound left-turn pocket, and westbound left-turn pocket at East 14th Street / Estudillo Avenue would continue to exceed existing storage capacity, under Baseline Conditions. There were no substantial changes to the constrained queue lengths when compared to Existing Conditions.

Table 9 – Baseline Conditions: Peak Hour Intersection Queue Analysis Results

Intersection	Turn Pocket	Storage Capacity	95th Percentile Queue (feet) AM Peak Hour	95th Percentile Queue (feet) PM Peak Hour
East 14th Street / Davis Street / Callan Avenue	NBL	100	**274**	**181**
	EBL	160	61	77
	WBL	60	42	39
East 14th Street / Estudillo Avenue	EBL	80	39	129
	SBL	80	11	**82**
	WBL	120	**152**	**131**
East 14th St / Dan Niemi Way / Chumalia	SBL	75	7	17
Davis Street / Hays Street / Dan Niemi Way	SBR	90	**126**	64
Bancroft Avenue / Callan Avenue	EBL	240	121	229
	NBL	95	**263**	54

Source: CHS Consulting Group, 2020.

Note: **Bold** text indicates 95th percentile queue length exceeds existing turn pocket storage capacity

4.0 BASELINE PLUS PROJECT CONDITIONS

This section presents the Baseline (Existing plus Approved) plus Project Conditions. This scenario is similar to Baseline Conditions, but with added traffic from the proposed project. **Figure 11**, p. 36, presents the Baseline plus Project peak hour traffic volumes.

4.1 Project Trip Generation

For the purposes of this study, the *ITE Trip Generation Manual, 10th Edition*[10] was used to estimate the anticipated vehicular trip generation for the proposed project during both the AM and PM peak hours for a typical weekday. Based on the proposed project's location within a moderately-dense urban area with good pedestrian connectivity and in proximity to high-frequency transit, Dense Multi-Use Urban[11] trip generation rates from *ITE Trip Generation Manual* were used as available.

Trip generation for the Project was calculated based on the proposed number of residential dwelling units and gsf of ground level commercial floor area. Vehicle trips for the residential dwelling units were estimated using the Mid-Rise Residential with First Floor Commercial land use category (ITE code 231) for General Urban/Suburban settings; for the supermarket component of the proposed project, vehicle trips were estimated using the Supermarket land use category (ITE code 850) for Dense Multi-Use Urban settings; for the coffee shop component of the proposed project, vehicle trips were estimated using the Coffee Shop land use designation (ITE code 936) for Dense Multi-Use Urban settings; for the durable goods retail component of the proposed project, vehicle trips were estimated using the Shopping Center land use designation (ITE code 820) for Dense Multi-Use Urban settings; and for the bank component of the proposed project, vehicle trips were estimated using the Walk-In Bank land use designation (ITE code 911) for General Urban/Suburban[12] settings contained in *ITE Trip Generation Manual, 10th Edition*.

As shown in **Table 10**, the Project would generate approximately 263 AM peak hour vehicle trips (124 inbound to the site and 139 outbound), and 485 PM peak hour vehicle trips (256 inbound to the site and 229 outbound from the site).

[10] Source: Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition Supplement, February 2020.

[11] ITE defines "Dense Multi-Use Urban" as a fully developed area (or nearly so) with diverse and complementary land uses, good pedestrian connectivity, and convenient and frequent transit; residential uses are typically multifamily or single-family on small lots; commercial uses often have no setback from the sidewalk network; and the complementary land uses provide the opportunity for short trips within the Dense Multi-Use Urban area, made convenient by walking, bicycling, or transit.

[12] The ITE Trip Generation Manual, 10th Edition does not provide a Dense Multi-Use Urban trip rate for Walk-In Bank land use code 911; therefore, as a conservative estimate the General Urban/Suburban settings trip rates were used.

Table 10 – ITE Vehicular Trip Generation Estimate

Vehicle Trip Generation Rates								
Land Use	**ITE Code**	**Unit**	**AM Peak Hour**			**PM Peak Hour**		
			Total	**Inbound**	**Outbound**	**Total**	**Inbound**	**Outbound**
Residential	231	units	0.30	28%	72%	0.36	70%	30%
Supermarket	850	1ksf	5.94	53%	47%	10.94	50%	50%
Coffee Shop	936	1ksf	3.64	75%	25%	79.09	51%	49%
Shopping Center	820	1ksf	2.41	54%	46%	4.92	48%	52%
Walk-In Bank	911	1ksf	22.54	52%	48%	12.13	44%	56%
Vehicle Trip Generation Estimates								
Land Use	**Amount**	**Unit**	**AM Peak Hour**			**PM Peak Hour**		
			Total	**Inbound**	**Outbound**	**Total**	**Inbound**	**Outbound**
Residential	196	units	59	16	43	71	50	21
Supermarket	23.208	1ksf	138	73	65	254	127	127
Coffee Shop	1.547	1ksf	6	4	2	122	62	60
Shopping Center	1.598	1ksf	4	2	2	8	4	4
Walk-In Bank	2.515	1ksf	56	29	27	30	13	17
Total			***262***	***124***	***138***	***485***	***256***	***229***

Source*: ITE Trip Generation Manual, 10th Edition Supplement, February 2020*; CHS Consulting Group, 2020.
Note: 1ksf = 1,000 square-feet

Internal Trip Capture

The rates presented in the *ITE Trip Generation Manual,* 10th Edition were collected at single-use, free-standing sites. Therefore, the *ITE Trip Generation Handbook*, 3rd Edition[13] recommends using the National Cooperative Highway Research Program (NCHRP) *Report 684: Enhancing Internal Trip Capture Estimation for Mixed-Use Developments*[14] procedure to estimate the level of internal trip capture from complementary land uses within mixed-use developments. The NCHRP internal trip capture spreadsheet tool was applied to the proposed project's residential, supermarket, coffee shop, shopping center, and bank land uses to estimate the number of trips that would occur between the proposed internal land uses. The internal trips would thus be discounted from the number of trips that would have otherwise occurred between the proposed project's land uses had they been single-use, stand-alone developments. **Table 11**, presents the resulting internal trip capture reductions for the AM and PM peak hours, as calculated using the NCHRP spreadsheet tool. Detailed NCHRP internal trip capture calculations are provided in **Appendix F**.

As shown in **Table 11**, internal trip capture would reduce AM peak hour vehicle trips by eight trips (3 inbound and 5 outbound) and PM peak hour vehicle trips by 175 trips (88 inbound and 87 outbound) when compared to similar single-use, free-standing developments.

[13] Source: Institute of Transportation Engineers (ITE) Trip Generation Handbook, 3rd Edition, September 2017.
[14] Source: Bochner, B., Hooper, B. Sperry, and R. Dunphy. NCHRP Report 684: Enhancing Internal Trip Capture Estimation for Mixed-Use Developments. Washington DC: Transportation Research Board, 2011.

Table 11 – ITE Internal Trip Capture Reductions

Land Use	ITE Code	AM Peak Hour			PM Peak Hour		
		Total	Inbound	Outbound	Total	Inbound	Outbound
Residential	231	-1	0	-1	-45	-32	-13
Supermarket	850	-2	0	-2	-65	-30	-35
Coffee Shop	936	-4	-3	-1	-55	-22	-33
Shopping Center	820	0	0	0	-2	-1	-1
Walk-In Bank	911	-1	0	-1	-8	-3	-5
Total Vehicle Trip Reduction		***-8***	***-3***	***-5***	***-175***	***-88***	***-87***

Source: NCHRP Internal Trip Capture Tool, *ITE Trip Generation Handbook, 3rd Edition, September 2017*; CHS Consulting Group, 2019.

Pass-By Trips

Not all traffic entering and exiting the project site is necessarily new traffic added to the roadway network. Retail developments often locate next to busy arterial roadways in order to attract existing passing motorists. As such, these developments attract a portion of their trips from traffic passing the project site on the way from an origin to an ultimate destination. Therefore, "pass-by" trips do not add new traffic to the adjacent roadway network and may be discounted from the total external trips generated by the proposed project. The proposed project's location at the junction of two significant arterial roadways (E. 14th Street and Davis Street/Callan Avenue) indicates that a significant share of the vehicle trips accessing the retail land uses at the project site would be drawn from existing traffic on the local roadway network.

Pass-by trips for the proposed project were calculated using average pass-by trip rates from the *ITE Trip Generation Handbook*, 3rd Edition. The average pass-by trip rate for the Supermarket land use (ITE code 850) is 36 percent during the PM peak hour only. The *ITE Trip Generation Handbook*, 3rd Edition does not provide a pass-by rate for the Walk-In Bank land use (ITE code 911), thus the pass-by trip rates for the Drive-In Bank land use (ITE code 912) were used, as both a walk-in and drive-in bank would be expected to experience similar pass-by trip rates. Therefore, the average pass-by trip rate for the Walk-In Bank land use (ITE code 911) is 29 percent during the AM peak hour and 35 percent during the PM peak hour. Similarly, The *ITE Trip Generation Handbook*, 3rd Edition does not provide a pass-by rate for the Coffee Shop without a Drive-Through land use (ITE code 936). However, it was determined that the Coffee Shop with a Drive-Through land use (ITE code 938) was not an appropriate replacement for Coffee Shop without a Drive-Through. Therefore, as a conservative estimate, the pass-by trip rate for High-Turnover Sit-Down Restaurant (ITE code 932) of 43 percent during the PM peak period only was applied to the Coffee Shop without a Drive-Through land use. Similarly, as a conservative estimate, no pass-by trip rate reductions were applied to the proposed project's shopping center land use, as this land use is not large enough to generate a significant number of peak hour vehicle trips.

As shown in **Table 12**, pass-by trip reductions would reduce AM peak hour vehicle trips generated by the Walk-In Bank by 16 vehicle trips (eight inbound and eight outbound). Pass-by trip reductions would reduce PM peak hour vehicle trips generated by the Supermarket land use by 68 vehicle trips (35 inbound and 33 outbound), the Coffee Shop land use by 29 vehicle trips (17 inbound and 12 outbound), and the Walk-In Bank land use by six vehicle trips (three inbound and three outbound), for a total reduction of 103 PM peak hour vehicle trips (55 inbound and 48 outbound).

Table 12 – ITE Pass-By Vehicle Trip Reduction

Land Use	ITE Code	Percent Reduction		AM Peak Hour			PM Peak Hour		
		AM Peak Hour	PM Peak Hour	Total	In	Out	Total	In	Out
Residential	231	0%	0%	0	0	0	0	0	0
Supermarket	850	0%	36%	0	0	0	-68	-35	-33
Coffee Shop	936	0%	43%	0	0	0	-29	-17	-12
Shopping Center	820	0%	0%	0	0	0	0	0	0
Walk-In Bank	911	29%	35%	-16	-8	-8	-6	-3	-3
Total Pass-By Vehicle Trip Reduction				**-16**	**-8**	**-8**	**-103**	**-55**	**-48**

Source: ITE Trip Generation Handbook, 3rd Edition, September 2017; CHS Consulting Group, 2020.

Existing Land Use Trip Credits

The project site is currently occupied by three buildings including the former CVS drug store (approximately 26,076 gsf), the Portuguese Fraternal Society of America (PFSA) building (approximately 11,755 gsf), and the PFSA office building (approximately 7,945 gsf). The former CVS drug store was not in operation during the time of traffic count collection on October 4, 2018. Therefore, the CVS drug store was not included in the existing trip credit calculation. The remaining land uses occupying the project site are comprised of a mixture of small retail businesses occupying approximately 8,990 gsf, professional services occupying approximately 3,765 gsf, and an instructional apprenticeship organization occupying approximately 6,945 gsf.

Traffic generated by the existing land uses were captured in the Existing Conditions traffic counts collected on October 4, 2018. Considering the existing land uses will no longer be in operation and generating vehicle trips under Baseline plus Project Conditions, these existing vehicle trips were discounted from the proposed project's vehicle trip generation.

The *ITE Trip Generation Manual*, 10th Edition was used to estimate the number of vehicle trips generated by the existing uses at the project site during the AM and PM peak hours for a typical weekday. Trip generation for existing uses was calculated based on the gsf of retail and commercial floor area. Vehicle trips for the retail uses were estimated using the Shopping Center land use designation (ITE code 820), commercial uses were estimated using the General Office land use designation (ITE code 710), and instructional uses were estimated using the Junior/Community College land use designation (ITE code 540) contained in *ITE Trip Generation Manual*, 10th Edition. **Table 13** presents the estimated daily AM and PM peak hour vehicle trips for the existing uses on an average weekday. As shown in **Table 13** the existing land uses currently generate approximately 27 AM peak hour trips (19 inbound and 8 outbound) and 51 PM peak hour trips (23 inbound and 28 outbound).

Table 13 – Existing Uses Vehicle Trip Generation

Existing Uses Vehicle Trip Generation Rates							
Land Use	**ITE Code**	**AM Peak Hour**			**PM Peak Hour**		
		Total	**Inbound**	**Outbound**	**Total**	**Inbound**	**Outbound**
Shopping Center	820	0.94	62%	38%	3.81	48%	52%
General Office	710	1.16	86%	14%	1.15	16%	84%
Instruction	540	2.07	77%	23%	1.86	50%	50%
Existing Uses Vehicle Trips							
Land Use	**Size**	**AM Peak Hour**			**PM Peak Hour**		
		Total	**Inbound**	**Outbound**	**Total**	**Inbound**	**Outbound**
Shopping Center	8,990	8	5	3	34	16	18
General Office	3,765	4	3	1	4	1	3
Instruction	6,945	14	11	3	13	6	7
Total	**19,700**	**27**	**19**	**8**	**51**	**23**	**28**

Source: *ITE Trip Generation Manual, 10th Edition Supplement, February 2020*; CHS Consulting Group, 2020.

Net New Project Vehicle Trips

Taking into account the proposed project's location in a dense multi-use urban setting, mixed-use urban design, proximity to high-capacity transit (BART and AC Transit 1T BRT Route on adjacent East 14th Street), and existing land uses, the proposed project would generate 51 fewer AM peak hour vehicle trips (30 inbound and 21 outbound) and 329 fewer PM peak hour vehicle trips (166 inbound and 163 outbound) when compared to similar single-land use, free-standing developments in a typical suburban setting. As a result and as shown in **Table 14**, the proposed project would generate 212 net new vehicle trips during the AM peak hour (94 inbound and 118 outbound), 156 net new vehicle trips during the PM peak hour (90 inbound and 66 outbound) on a typical weekday.

It should be noted that for conservative purposes the vehicle trip reductions for the proposed project were filtered. The internal vehicle trip reduction was applied first to the standard ITE trip rates, pass-by trips were then calculated based on the resulting project trips after internal trip reductions were applied. Furthermore, the project site is considered an infill transit-oriented development, which generally experience different travel mode characteristics when compared to a stand-alone development in an auto oriented development. ITE research conducted in California at new infill transit oriented developments similar to the proposed project showed that approximately 37 percent of trips during both the AM and PM peak periods arrived via walking or bicycling, while 15 percent arrived via transit during the AM peak hour and 17 percent arrived via transit during the PM peak hour.[15] This would equate to a reduction in vehicle trips of 52 percent during the AM peak hour and 54 percent during the PM peak hour. This would result in a further reduction of 102 vehicle trips during the AM peak hour (45 inbound and 57 outbound) and 72 vehicle trips during the PM peak hour (42 inbound and 30 outbound). However, for conservative purposes these reductions were not factored into the proposed project travel demand.

[15] Source: ITE Trip Generation Handbook, 3rd Edition, September 2017.

Table 14 – Summary of Net New Project Vehicle Trips

Land Use	Amount	Unit	AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out
Residential	196	units	59	16	43	71	50	21
Internal Trip Capture			-1	0	-1	-45	-32	-13
Total Residential Vehicle Trips			***58***	***16***	***42***	***26***	***18***	***8***
Supermarket	23,208	sq ft	138	73	65	254	127	127
Internal Trip Capture			-2	0	-2	-65	-30	-35
Pass-By Trips			0	0	0	-68	-35	-33
Total Supermarket Vehicle Trips			***136***	***73***	***63***	***121***	***62***	***59***
Coffee Shop	1,547	sq ft	6	4	2	122	62	60
Internal Trip Capture			-4	-3	-1	-55	-22	-33
Pass-By Trips			0	0	0	-29	-17	-12
Total Coffee Shop Vehicle Trips			***2***	***1***	***1***	***38***	***23***	***15***
Shopping Center	1,598	sq ft	4	2	2	8	4	4
Internal Trip Capture			0	0	0	-2	-1	-1
Total Shopping Center Vehicle Trips			***4***	***2***	***2***	***6***	***3***	***3***
Walk-In Bank	2,515	sq ft	56	29	27	30	13	17
Internal Trip Capture			-1	0	-1	-8	-3	-5
Pass-By Trips			-16	-8	-8	-6	-3	-3
Total Walk-In Bank Vehicle Trips			***39***	***21***	***18***	***16***	***7***	***9***
A: Total ITE Vehicle Trips			***263***	***124***	***139***	***485***	***256***	***229***
Total ITE Internal Trip Capture			*-8*	*-3*	*-5*	*-175*	*-88*	*-87*
Total ITE Pass-By Trips			*-16*	*-8*	*-8*	*-103*	*-55*	*-48*
B: Total ITE Trip Reduction			***-24***	***-11***	***-13***	***-278***	***-143***	***-135***
C: Total Project Vehicle Trips			***239***	***113***	***126***	***207***	***113***	***94***
D: Existing Uses Vehicle Trip Credit			***-27***	***-19***	***-8***	***-51***	***-23***	***-28***
E: Net New Project Vehicle Trips			**212**	**94**	**118**	**156**	**90**	**66**

Sources: ITE Trip Generation Manual, 10th Edition Supplement, February 2020; ITE Trip Generation Handbook, 3rd Edition, September 2017; CHS Consulting Group, 2020.

Notes:

1. sf = square feet
2. Total ITE trip reduction is the combined trip reduction from the ITE internal trip capture and pass-by calculations.
3. Vehicle trips in table may differ slightly from calculations, due to rounding.

4.2 Project Trip Distribution and Assignment

Table 15 presents the expected trip distribution patterns for the proposed project based on review of existing conditions traffic counts collected by CHS and determined in collaboration with City of San Leandro staff. These trip distribution patterns were used as the basis for assigning the proposed project trips to the local streets and study intersections within the study area. **Figure 10** presents the AM and PM peak hour trip distribution and trip assignment at the study intersections for the proposed project. **Figure 11** presents the AM and PM peak-hour Baseline plus Project Conditions traffic volumes at the study intersections, resulting from the addition of proposed project trips to Baseline Conditions traffic volumes.

Table 15 – Project Trip Distribution Percentages

Intersection	Percent
Davis Street (to/from the west)	48%
East 14th Street (North of Davis Street)	14%
East 14th Street (South of Estudillo Street)	14%
Bancroft Avenue (North of Callan Avenue)	6%
Estudillo Avenue (to/from the east)	18%
TOTAL	**100%**

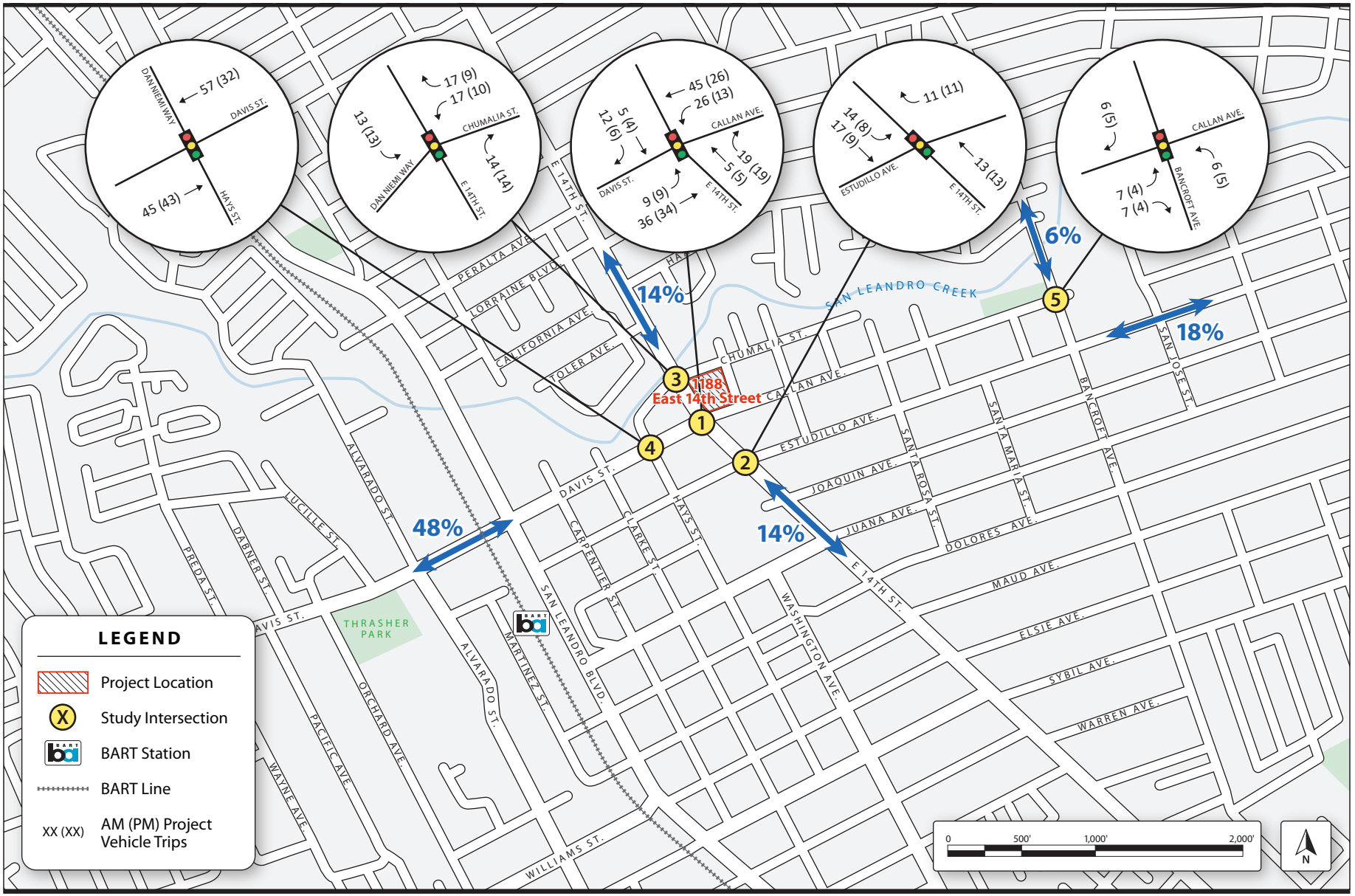

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Figure 10
Project Trip Distribution and Trip Assignment

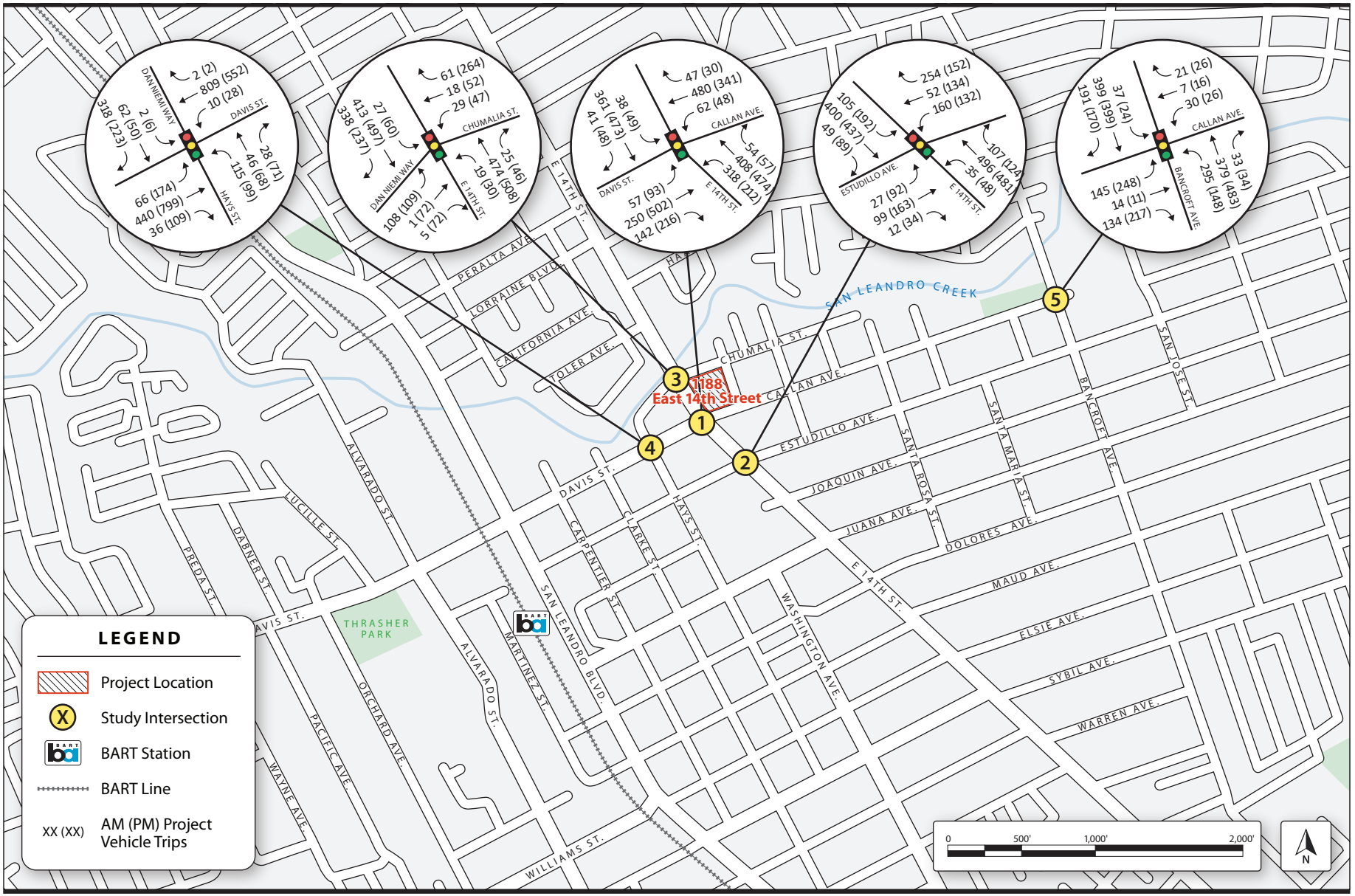

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Figure 11
Baseline Plus Project Peak Hour Traffic Volumes

4.3 Level of Service Analysis – Baseline plus Project Conditions

Table 16 presents the LOS and delay analysis results for the study intersections during the weekday AM and PM peak hours under Baseline plus Project Conditions. Baseline plus Project Conditions intersection LOS calculations are provided in **Appendix D**.

As shown in **Table 16**, all of the study intersections would continue to operate within City LOS standards of LOS D or better under Baseline plus Project Conditions, which includes the addition of project traffic. Although average delays increase slightly at the study intersections compared to Baseline Conditions, most study intersections are expected to maintain the same LOS as Baseline Conditions. During the PM peak hour, the intersection of East 14th Street / Chumalia Street / Dan Niemi Way would change from LOS B under Baseline Conditions to LOS C under Baseline plus Project Conditions, but would still operate within acceptable City standards.

Table 16 – Baseline plus Project Conditions: Peak Hour Intersection Level of Service Results

Intersection	Control Type	Baseline Conditions				Baseline plus Project Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delay[2]	LOS[3]
East 14th St/Davis St/Callan Avenue[1]	Signal	26.3	C	24.4	C	26.5	C	24.3	C
East 14th Street/Estudillo Avenue[1]	Signal	14.5	B	21.0	C	14.4	B	21.8	C
East 14th St/Chumalia St/Dan Niemi Way[1]	Signal	7.5	A	19.8	B	9.1	A	22.8	C
Davis Street/Dan Niemi Way/Hays Street[1]	Signal	21.1	C	22.1	C	20.6	C	21.9	C
Callan Avenue/Bancroft Avenue	Signal	35.1	D	19.6	B	36.2	D	20.0	B

Source: CHS Consulting Group, 2020.

Notes:

1. Intersection is located within a Priority Development Area (PDA) where LOS E is the minimum acceptable service level.
2. Delay reported as seconds per vehicle. For signalized and all-way stop controlled intersections, a weighted average delay and level of service (LOS) based on all intersection approaches is reported. For unsignalized intersections (1-way and 2-way stop controlled), delay and LOS for the worst stop-controlled approach is reported.
3. LOS = Level of Service

4.4 95th Percentile Queue Length Analysis – Baseline plus Project Conditions

As part of the LOS analysis under Baseline plus Project Conditions, peak hour 95th percentile queue lengths were analyzed and compared with the existing storage capacity of exclusive left- and right-turn lanes at study intersections where proposed project-generated traffic is expected to be added. Baseline and Baseline plus Project peak hour intersection queue analysis results are summarized in **Table 17**, p. 39.

As shown in **Table 17**, p. 39, under Baseline plus Project Conditions the 95th percentile queue length at the northbound left-turn pocket at East 14th Street / Davis Street / Callan Avenue, the westbound left-turn pocket at East 14th Street / Estudillo Avenue, the southbound right-turn at Davis Street / Hays Street / Dan Niemi Way, and the northbound left-turn at Bancroft Avenue / Callan Avenue would continue to exceed storage capacity during the AM peak hour. In addition, the westbound left-turn pocket at East 14th Davis Street / Callan Avenue would now be at capacity during the AM peak hour. During the PM peak hour, the northbound left-turn pocket at East 14th Street / Davis Street / Callan Avenue; the eastbound left-turn pocket, southbound left-turn pocket, and westbound left-turn pocket at East 14th Street / Estudillo Avenue would continue to exceed existing storage capacity.

Although 95th percentile queue lengths increase slightly at the study intersections compared to Baseline Conditions, most study intersections are expected to maintain a 95th percentile queue length that is within the existing turn pocket storage capacity. For turn pockets that already exceed capacity under Baseline Conditions, the proposed project would contribute less than a car length to the 95th percentile queue length, except for one exception below.

Of the constrained turn pockets under Baseline plus Project Conditions, the proposed project would contribute an additional one foot (less than one car length) to the 95th percentile queue length at the northbound left-turn pocket and 20 feet (approximately one car length) to the 95th percentile queue length at the westbound left-turn pocket of the East 14th Street / Davis Street / Callan Avenue intersection; an additional 18 feet (approximately one car length) to the southbound right-turn pocket at the Davis Street / Hays Street / Dan Niemi Way intersection; and a reduction of 13 feet to the 95th percentile queue length at the northbound left-turn pocket at the Bancroft Avenue / Callan Avenue intersection, during the AM peak hour. Therefore, the proposed project would not contribute significantly, as these turn pockets are already constrained under Existing and Baseline Conditions, and the proposed project would not contribute more than one car length to any single turn pocket during the AM peak hour.

Similarly, of the turn pockets constrained during the PM peak hour under Baseline plus Project Conditions, the proposed project would contribute a additional six feet to the 95th percentile queue length at the northbound left-turn pocket of the East 14th Street / Davis Street / Callan Avenue intersection; would add an additional four feet to the eastbound left-turn pocket, an additional 47 feet (approximately three car lengths) to the southbound left-turn pocket, and contribute a reduction of three feet to westbound left-turn pocket at the East 14th Street / Estudillo Avenue intersection. Even though the proposed project would contribute approximately three car lengths (47 feet) to the southbound left-turn pocket of the East 14th Street / Estudillo Avenue intersection, this turn pocket is already at capacity under Existing and Baseline Conditions, and is physically constrained by the northbound left-turn pocket at the East 14th Street / Davis Street / Callan Avenue intersection. Therefore, it is recommended that further analysis be conducted for the East 14th Street / Estudillo Avenue intersection to address the constrained turn pockets occurring under Existing, Baseline, and Baseline plus Project Conditions.

Furthermore, this analysis assumes a worst-case-scenario for project generated traffic at the intersection of East 14th Street and Estudillo Avenue, as proposed project generated traffic that was assigned to the southbound left-turn lane and westbound right-turn lanes would in reality have multiple alternative route options, including the Huff Avenue roadway segment linking Estudillo and Callan Avenues, approximately a quarter-mile east of the project site.

Table 17 – Baseline plus Project Conditions: Peak Hour Intersection Queue Analysis Results

Intersection	Turn Pocket	Storage Capacity	Baseline Conditions		Baseline plus Project Conditions	
			AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
East 14th Street / Davis Street / Callan Avenue	NBL	100	**274**	**181**	**275**	**187**
	EBL	160	61	77	69	84
	WBL	**60**	42	39	**62**	50
East 14th Street / Estudillo Avenue	EBL	80	39	**129**	39	**133**
	SBL	80	11	**82**	13	**129**
	WBL	120	**152**	**131**	**151**	**128**
East 14th St / Dan Niemi Way / Chumalia Street	SBL	75	7	17	13	43
Davis Street / Hays Street / Dan Niemi Way	SBR	90	**126**	64	**144**	64
Bancroft Avenue / Callan Avenue	EBL	240	121	229	130	234
	NBL	95	**263**	54	**250**	56

Source: CHS Consulting Group, 2020.

Note: **Bold** text indicates 95th percentile queue length exceeds existing turn pocket storage capacity

4.5 Vehicle Miles Traveled (VMT)

As discussed in Section 2.5, the proposed project is located in TAZ 871, which has an average employee VMT of 21.36 miles per employee, which is nine percent above the regional average minus 15 percent VMT threshold of 19.64 miles per employee; and an average resident VMT of 10.35 miles per capita, which is approximately 18 percent below the regional average minus 15 percent threshold of 12.64 miles per capita.

However, per CEQA Appendix G, Section 15064.3(b)(1), land use projects within one-half mile of an existing high-quality transit corridor should be presumed to cause less than significant transportation impacts. The proposed project would be located within one-half mile of the San Leandro BART station and adjacent to a high-quality transit corridor (AC Transit Route 1T operates on East 14th Street and Davis Street at 10-minute headways), and thus is expected to generate significantly lower VMT per employee and resident compared to existing uses in TAZ 871. The proposed project would also conform to the standards prescribed in the *TOD Strategy* and would provide on-site parking below the rate required by *City Code*. For these reasons, the proposed project would be presumed to result in a less-than-significant impact in terms of VMT.

4.6 Project Site Access and Circulation

The proposed project site plan was reviewed to determine adequacy of circulation. Internal drive aisles are at least 24-feet wide and of sufficient width to accommodate two-way traffic operations for circulating vehicles, delivery trucks, and emergency vehicles, as well as vehicular parking maneuvers to/from the perpendicular parking spaces (see **Appendix G**). The drive aisle dimensions are consistent with the requirements of Section 4-1720 of the *City of San Leandro Zoning Code* (herein referred to as the "*City Code*"), which requires a minimum 24-foot width for onsite parking lot drive aisles.

The ground level parking garage serving ground-level retail and residents would be accessed via two separate driveways, including a 24-foot wide driveway on Callan Avenue and a 39-foot-4-inch wide driveway on Chumalia Street. The Callan Avenue driveway would require restriping the westbound left-

turn pocket at the intersection of Callan Avenue and Hyde Street, extending the existing double left-turn lane on Callan Avenue west to the proposed project driveway. The restriping would provide vehicles making left-turns into the Callan Avenue driveway sufficient space to queue and vehicles making left-turns out of the Callan Avenue driveway a refuge area to cross westbound traffic and merge with eastbound traffic. In addition to restriping the westbound left-turn pocket at the Callan Avenue driveway, "do not block" intersection markings would be installed within the westbound travel lanes, directly adjacent to the Callan Avenue driveway, to ensure any potential vehicle queues on westbound Callan Avenue won't block access to/from the Callan Avenue driveway. An interior freight loading area for the supermarket would be provided on the ground floor, accessible via the 39-foot-4-inch wide driveway on Chumalia Street. Smaller deliveries would be accommodated curbside on Chumalia Street, directly adjacent to the Supermarket employee entrance and onsite loading dock.

The second level of the parking garage serving residents would be accessible via a 24-foot wide ramp on Hyde Street. Hyde Street between Chumalia Street and the project driveway would be converted to two-way traffic operation, permitting vehicles to access the second level of the parking garage from Chumalia Street. Hyde Street would continue to operate as a one-way northbound-only roadway south of the proposed project driveway. Approximately 19 of the existing 22 diagonal on-street parking spaces would continue to be provided along the west side of Hyde Street, while the 21 existing diagonal on-street parking spaces along the east side of Hyde Street would be removed.

The Project driveways, located on Callan Avenue, Hyde Street, and Chumalia Street would provide adequate sight distance to ensure exiting vehicles would be within view of pedestrians on the adjacent sidewalk. However, vehicles parking along Chumalia Street and street trees planted along the Project's driveways may affect the visibility of exiting vehicles. Therefore, in accordance with Section 4-1728 of the *City Code*, the proposed project shall ensure that there are no obstructions between the height of three (3) feet and seven (7) feet within 10 feet in either direction of the Project driveways at the street property line. This would include implementing parking restrictions within at least 10 feet of the Project's driveways and maintaining at least a 7-foot clearance between the ground and the lower branch of any tree within 10 feet of the Project's driveways.

4.7 Project Parking

In accordance with Section 4-1708 of the *City Code*, the TOD Strategy Plan recommends a maximum parking ratio for residential uses of 1.5 parking spaces per dwelling unit and an allowance of unbundled flex[16] spaces of 0.25 to 0.5 parking spaces per unit above the 1.5 space per unit maximum. The proposed project would provide 216 parking spaces for residential use on the second level of the parking garage at a ratio of approximately 1.1 parking spaces per unit. The 216 parking spaces located on the second-level parking garage and serving the residential use would consist of 108 vertical car stacker spaces, 18 compact parking spaces, six (6) standard ADA-accessible spaces, one (1) ADA-accessible van space, one (1) ADA-accessible EV space, 21 standard EV spaces, six (6) clean air/vanpool spaces, and 55 standard parking spaces.

The TOD Strategy Plan further recommends a maximum parking ratio for retail uses of 2.0 spaces per 1,000 square-feet of gross floor area. The proposed project would provide 70 parking spaces for retail use on the ground level of the parking garage at a ratio of approximately 2.4 parking spaces per 1,000 square-

[16] The *Downtown San Leandro Transportation Oriented Development Strategy* defines unbundled flex parking as on-site parking that is not exclusive to a particular dwelling unit that may be leased to tenants with additional parking needs or can be reserved for visitor parking.

feet. The 70 on-site parking spaces located on the ground-level parking garage would consist of one (1) standard EV parking spaces, 18 compact parking spaces, one (1) standard ADA-accessible spaces, one (1) ADA-accessible van spaces, two (2) ADA-accessible EV parking space, and 47 standard parking spaces. Additionally, 19 of the existing 43 standard parking spaces would continue to be provided as diagonal on-street parking spaces along the proposed project's Hyde Street frontage.

As per Section 4-1702(D) of the *City Code*, if more than one use is located on-site, the number of required on-site parking spaces shall be equal to the sum of the maximum allowable prescribed for each use. The proposed project's 286 on-site parking spaces would thus be within the prescribed maximum of 352 parking spaces. Therefore, on this basis the proposed project would be consistent with the guidelines of the *City Code* and *TOD Strategy Plan*.

As supported by Section 4-1706 of the *City Code*, a use permit may be granted for the collective provision of parking on-site that serves more than one (1) land use, allowing a reduced total on-site parking supply for complimentary land uses. The proposed project would designate the 71 parking spaces of the 216 residential parking spaces located in the level-two parking garage as flexible parking spaces, allowing retail users to access any potential surplus of on-site parking. The 71 flex parking spaces would thus supplement the 70 retail spaces located on the ground level for a total of up to 141 on-site parking spaces available to retail users between 9:00 a.m. and 5:00 p.m., five to six days per week. Six (6) motorcycle parking spaces would also be provided on the second level of the parking garage.

Additionally, the proposed project would provide a Class 1 (long-term) secure bicycle storage rooms on each level of the parking garage with a combined storage capacity of 76 long-term bicycle parking spaces. The Class 1 bicycle storage room on the ground-level would be located in the parking garage adjacent to proposed project driveway on Chumalia Street and would provide direct pedestrian access to the sidewalk. The Class 1 bicycle storage room on the second level would be located within the gated resident only portion of the garage, accessible via the retail or residential elevators.

As per Section 4-1714 of the *City Code*, commercial uses are required to provide bicycle parking at a rate of five percent of the required automobile parking spaces. Based on the city code, the coffee shop would be required to provide one (1) parking space for each 100 gsf, the supermarket would be required to provide one (1) space per 200 gsf, the general retail sales use would be required to provide 1 space per 200 gsf, and the bank would be required to provide one (1) per 300 gsf.[17] This would equate to approximately 116 parking spaces required for the supermarket, 16 parking spaces for the coffee shop, eight spaces for general retail sales, and eight parking spaces for the bank for a total of 148 parking spaces. Therefore, the proposed project would provide eight (8) Class 2 (short-term) bicycle parking spaces within the sidewalk along the Project frontages on East 14th Street and Callan Avenue, meeting the required bicycle parking spaces, per *City Code* (5% of 148 vehicular parking spaces). The Class 2 (Short-term) bicycle parking spaces would meet the design requirements defined in Section 4-1714 of the *City Code*, providing spaces that permit the secure locking of bicycle frame and at least one wheel with a standard u-type lock and support the bicycle in a stable position without damage to wheels, frame, or other components (*Ord. 2008-003 § 12; Ord. 2001-015 § 1*). Therefore, the proposed project would be consistent with the guidelines of the *City Code* and *TOD Strategy Plan*.

[17] Source: San Leandro Zoning Code: http://www.qcode.us/codes/sanleandro-zoning/

5.0 CUMULATIVE CONDITIONS

This section details expected traffic conditions at the study intersections under Cumulative Conditions. This scenario is defined as future traffic conditions in year 2040 attributable to City-wide buildout development that includes proposed project trips, given that the proposed project is consistent with the TOD Strategy Plan. Traffic volumes under Cumulative Conditions are based on the ACTC 2040 travel demand model and existing traffic counts at study intersections. CHS developed growth factors derived from linear traffic growth projected in the ACTC 2040 travel demand model and applied them to the existing (2018) traffic volumes collected at the five study intersections.

It should also be noted that 2018 vehicular traffic turning movements collected for this study were in some cases lower than the existing traffic volumes used to estimate year 2040 intersection volumes in the *City of San Leandro 2035 General Plan Update DEIR*. As a result, some 2040 intersection turning movements estimated from the ACTC model were lower than comparable 2035 DEIR intersection turning movements. To estimate a worst-case (conservative) scenario, CHS adjusted such 2040 turning movements to match the 2035 DEIR. Additionally, other calculated 2040 turning movements were higher than comparable 2035 DEIR turning movements. Consequently, 2040 cumulative conditions LOS and delay results as presented in this study report may differ from the 2040 results presented in the *City of San Leandro 2035 General Plan Update DEIR*.

Figure 12 presents the Cumulative (2040) peak hour traffic volumes resulting from these adjustments, which include proposed project traffic.

5.1 Land Use and Transportation Assumptions

Future land use and transportation assumptions for the cumulative traffic analysis are reflected in the 2040 traffic volumes in this study and are consistent with the *2035 General Plan Update*, the *Downtown San Leandro Transit-Oriented Development Strategy,* and City of San Leandro *Bicycle and Pedestrian Master Plan.*

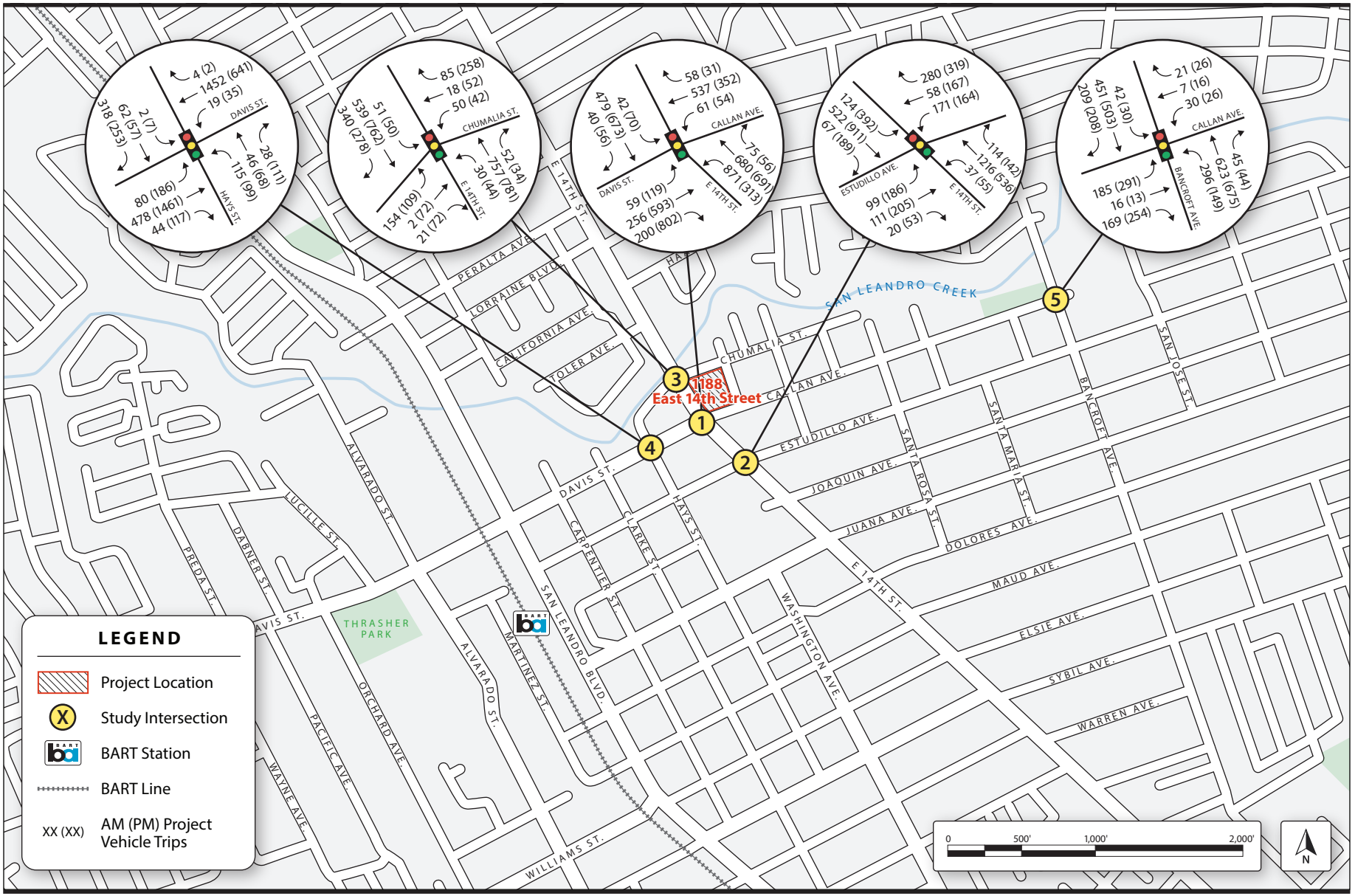

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Figure 12
Cumulative (2040) Peak Hour Traffic Volumes

5.2 Level of Service Analysis – Cumulative Conditions

Table 18 presents the LOS and delay analysis results for the study intersections for the weekday AM and PM peak hours under Cumulative (2040) Conditions. Cumulative Conditions intersection turning movement count data are provided in **Figure 12**, p. 43, and intersection LOS calculations are provided in **Appendix E**. As shown in **Table 18**, some of the study intersections would no longer continue to operate within City LOS standards of LOS D or better under Cumulative Conditions. However, all study intersections operating worse than LOS D under Cumulative Conditions are within the TOD Strategy PDA, where LOS E is the minimum acceptable service level. Therefore, all of the study intersections would operate within acceptable City LOS standards under Cumulative Conditions. These service levels are due primarily to background traffic growth in Cumulative Conditions, as the proposed project would only contribute up to 158 peak hour vehicle trips (approximately 5 percent of peak hour traffic volume) at the East 14th Street/Davis Street/Callan Avenue intersection.

Table 18 – Cumulative Conditions: Peak Hour Intersection Level of Service Results

Cumulative Conditions		Control Type	AM Peak Hour		PM Peak Hour	
ID	Intersection		Delay	LOS	Delay	LOS
1	East 14th Street/Davis Street/Callan Avenue[1]	Signal	66.8	E	47.6	D
2	East 14th Street/Estudillo Avenue[1]	Signal	24.2	C	51.1	D
3	East 14th Street/Chumalia Street/Dan Niemi Way[1]	Signal	9.7	A	19.1	B
4	Davis Street/Dan Niemi Way/Hays Street[1]	Signal	22.1	C	21.4	C
5	Callan Avenue/Bancroft Avenue	Signal	51.1	D	29.8	C

Source: CHS Consulting Group, 2020.

Notes:

1. Intersection is located within a Priority Development Area (PDA) where LOS E is the minimum acceptable service level.
2. Delay reported as seconds per vehicle. For signalized and all-way stop controlled intersections, a weighted average delay and level of service (LOS) based on all intersection approaches is reported. For unsignalized intersections (1-way and 2-way stop controlled), delay and LOS for the worst stop-controlled approach is reported.
3. LOS = Level of Service

5.3 95th Percentile Queue Length Analysis – Cumulative Conditions

As part of the LOS analysis under Cumulative Conditions, peak hour 95th percentile queue lengths were analyzed and compared with the existing storage capacity of exclusive left- and right-turn lanes at study intersections where proposed project-generated traffic is expected to be added. Cumulative Conditions Peak Hour intersection queue analysis results are summarized in **Table 19**, p. 45.

As shown in **Table 19**, under Cumulative Conditions the 95th percentile queue length at the northbound left-turn pocket at East 14th Street / Davis Street / Callan Avenue; the southbound and westbound left-turn pockets at East 14th Street / Estudillo Avenue; the southbound right-turn pocket at Davis Street / Hays Street / Dan Niemi Way; and the northbound left-turn pocket at Bancroft Avenue / Callan Avenue would continue to exceed storage capacity during the AM peak hour, under Cumulative Conditions. In addition, the eastbound left-turn at East 14th Street / Estudillo Avenue would exceed existing storage capacity under Cumulative Conditions, which is attributable to traffic growth from the San Leandro General Plan.

During the PM peak hour, the northbound left-turn pocket at East 14th Street / Davis Street / Callan Avenue; and the eastbound, southbound, and westbound left-turn pockets at East 14th Street / Estudillo Avenue would continue to exceed existing storage capacity under Cumulative Conditions. In addition, the

eastbound left-turn pocket at Bancroft Avenue / Callan Avenue would exceed existing storage capacity under Cumulative Conditions, which is attributable to traffic growth from the San Leandro General Plan.

Table 19 – Cumulative Conditions: Peak Hour Intersection Queue Analysis Results

Intersection	Turn Pocket	Storage Capacity	95th Percentile Queue (feet) AM Peak Hour	95th Percentile Queue (feet) PM Peak Hour
East 14th Street / Davis Street / Callan Avenue	NBL	100	**1,058**	**335**
	EBL	160	69	99
	WBL	60	59	47
East 14th Street / Estudillo Avenue	EBL	80	**166**	**275**
	SBL	80	**180**	**352**
	WBL	120	**163**	**138**
East 14th St / Dan Niemi Way / Chumalia Street	SBL	75	19	48
Davis Street / Hays Street / Dan Niemi Way	SBR	90	**229**	68
Bancroft Avenue / Callan Avenue	EBL	240	194	**292**
	NBL	95	**272**	82

Source: CHS Consulting Group, 2020.

Note: **Bold** text indicates 95th percentile queue length exceeds existing turn pocket storage capacity

6.0 CONCLUSIONS

This section presents the study conclusions for the 1188 East 14th Street TIS in the City of San Leandro. Implementation of the proposed project would result in no significant impacts with respect to the addition of proposed project traffic, and therefore, no mitigation measures are required.

- The proposed project is expected to generate 212 net new vehicle trips during the AM peak hour and 156 during the PM peak hour.

- Under Existing Conditions, all five study intersections operate within City LOS standards of LOS D or better. The existing 95th percentile queue length already exceeds the storage capacity of the northbound left-turn pocket at the intersection of Bancroft Avenue and Callan Avenue, during the AM peak hour. During the PM peak hour, the existing 95th percentile queue length already meets the storage capacity of the southbound left-turn pocket at the intersection of East 14th Street and Estudillo Avenue.

- Pedestrian, bicycle, and transit facilities adequately serve the project site with few network gaps within the study area. Pedestrian, bicycle, and transit improvements to fill network gaps and improve pedestrian, bicycle, and transit access and safety have been identified within the *City of San Leandro 2035 General Plan Update, Downtown San Leandro Transit-Oriented Development Strategy, and Bicycle and Pedestrian Master Plan*. Additional recommendations for new bicycle facilities have been identified as feasible for Dan Niemi Way and Chumalia Street, which would require further analysis and design review before implementation.

- Under Existing plus Approved Project (Baseline) Conditions, study intersections are anticipated to continue to operate within City LOS standards of LOS D or better. Anticipated 95th percentile queue lengths would result in no impacts when compared with Existing Conditions.

- Under Baseline plus Project Conditions, study intersections are anticipated to continue to operate within City LOS standards of LOS D or better. Project generated traffic is anticipated to increase 95th percentile queue lengths that would constrain the westbound left-turn turn pocket at the intersection of East 14th Street / Davis Street / Callan Avenue during the AM peak hour. Proposed project generated vehicle trips would not contribute more than one car length to 95th percentile queue lengths at turn pockets that are already at capacity under Existing Conditions, excepting for the southbound left-turn pocket at East 14th Street / Estudillo Avenue that is physically constrained by the northbound left-turn pocket at the intersection of East 14th Street / Davis Street / Callan Avenue.

- Per CEQA Appendix G, Section 15064.3(b)(1), the proposed project would be located adjacent to a high-quality transit corridor (AC Transit Route 1T stops adjacent to the project site on East 14th Street and Davis Street with 10-minute headways) and within one-half mile of the San Leandro BART station, and thus is presumed to cause less-than-significant impacts related to VMT.

- On-site circulation is expected to be adequate. The proposed project would meet all requirements for vehicle and bicycle parking outlined in the *Downtown San Leandro Transportation-Oriented Development Strategy,* but would provide fewer vehicle parking spaces than prescribed by *City of San Leandro Zoning Code.*

- Under Cumulative Conditions, study intersections are not anticipated to continue operating within City LOS standards of LOS D or better. The East 14th Street/Callan Avenue/Davis Street intersection would exceed LOS D during the AM peak. However, this intersection is located within a PDA where they would operate within the acceptable LOS standard of LOS E or better. Anticipated 95th percentile queue lengths would exceed existing storage capacity at six study intersection turn pockets during the AM peak hour and six study intersection turn pockets during the PM peak hour.

7.0 REFERENCES

- *Highway Capacity Manual, Transportation Research Board*, 2000
- *Institute of Transportation Engineers Trip Generation Manual, 10th Edition Supplement*, February 2020.
- *Institute of Transportation Engineers Trip Generation Handbook, 3rd Edition*, September 2017.
- Bochner, B., Hooper, B. Sperry, and R. Dunphy. *NCHRP Report 684: Enhancing Internal Trip Capture Estimation for Mixed-Use Developments*. Washington DC: Transportation Research Board, 2011.
- *City of San Leandro 2035 General Plan Update* – Adopted September 19, 2016.
- *City of San Leandro 2035 General Plan Update*, Draft Environmental Impact Report, June 1, 2016.
- *San Leandro Bicycle and Pedestrian Master Plan,* City of San Leandro, March 2018.
- *Downtown San Leandro Transit-Oriented Development Strategy,* City of San Leandro, September 4, 2007.
- *Downtown San Leandro Transit-Oriented Development Strategy,* Draft Environmental Impact Report, Kimley-Horn and Associates, Inc., September 5, 2006.

Appendices

Appendix A	Existing Vehicle, Pedestrian, and Bicycle Turning Movements
Appendix B	Existing Conditions LOS and Queue Length Calculations
Appendix C	Baseline Conditions LOS and Queue Length Calculations
Appendix D	Baseline plus Project LOS and Queue Length Calculations
Appendix E	Cumulative Conditions LOS and Queue Length Calculations
Appendix F	NCHRP Internal Trip Capture Calculations
Appendix G	Detailed Project Site Plans

APPENDIX A – EXISTING VEHICLE, PEDESTRIAN, AND BICYCLE TURNING MOVEMENTS

Counts Unlimited
PO Box 1178
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City of San Leandro
N/S: East 14th Street
E/W: Davis Street/Callan Avenue
Weather: Clear

File Name : 01_SLD_E 14th_Davis_Callan AM
Site Code : 22018742
Start Date : 10/4/2018
Page No : 1

Groups Printed- Total Volume

	East 14th Street Southbound				Callan Avenue Westbound				East 14th Street Northbound				Davis Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	3	50	5	58	1	97	6	104	40	57	5	102	10	42	30	82	346
07:15 AM	9	48	7	64	3	110	5	118	52	51	8	111	7	44	25	76	369
07:30 AM	6	93	8	107	6	137	12	155	92	78	8	178	12	53	36	101	541
07:45 AM	12	99	5	116	5	93	7	105	66	80	9	155	7	53	40	100	476
Total	30	290	25	345	15	437	30	482	250	266	30	546	36	192	131	359	1732
08:00 AM	11	87	5	103	11	92	15	118	86	116	9	211	18	61	35	114	546
08:15 AM	9	77	10	96	14	112	13	139	74	129	9	212	8	47	31	86	533
08:30 AM	9	76	8	93	10	132	15	157	70	78	13	161	14	70	35	119	530
08:45 AM	10	62	3	75	6	112	7	125	47	70	9	126	15	44	41	100	426
Total	39	302	26	367	41	448	50	539	277	393	40	710	55	222	142	419	2035
Grand Total	69	592	51	712	56	885	80	1021	527	659	70	1256	91	414	273	778	3767
Apprch %	9.7	83.1	7.2		5.5	86.7	7.8		42	52.5	5.6		11.7	53.2	35.1		
Total %	1.8	15.7	1.4	18.9	1.5	23.5	2.1	27.1	14	17.5	1.9	33.3	2.4	11	7.2	20.7	

	East 14th Street Southbound				Callan Avenue Westbound				East 14th Street Northbound				Davis Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	6	93	8	107	6	**137**	12	**155**	**92**	78	8	178	12	53	36	101	541
07:45 AM	**12**	**99**	5	**116**	5	93	7	105	66	80	**9**	155	7	53	**40**	100	476
08:00 AM	11	87	5	103	11	92	**15**	118	86	116	9	211	**18**	**61**	35	**114**	**546**
08:15 AM	9	77	**10**	96	**14**	112	13	139	74	**129**	9	**212**	8	47	31	86	533
Total Volume	38	356	28	422	36	434	47	517	318	403	35	756	45	214	142	401	2096
% App. Total	9	84.4	6.6		7	83.9	9.1		42.1	53.3	4.6		11.2	53.4	35.4		
PHF	.792	.899	.700	.909	.643	.792	.783	.834	.864	.781	.972	.892	.625	.877	.888	.879	.960

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Site Code : 22018742
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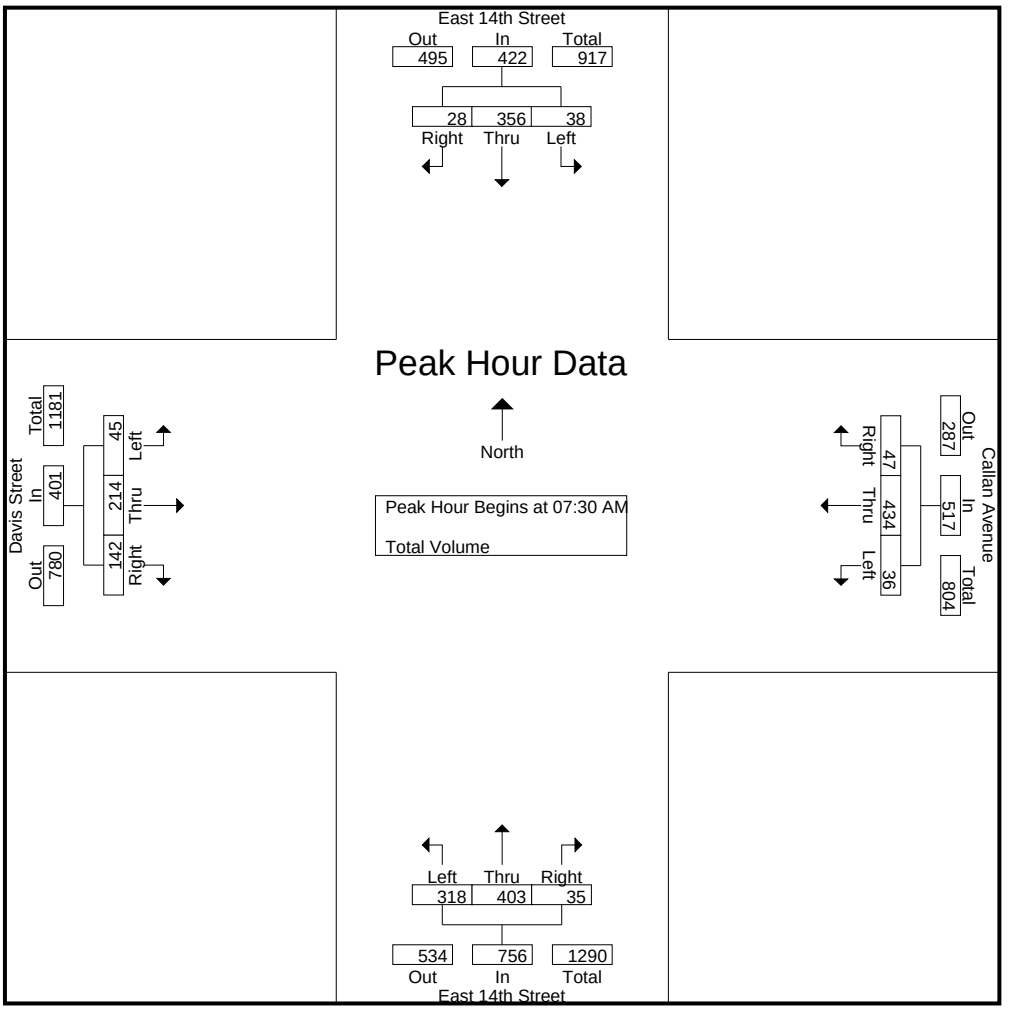

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				08:00 AM				07:30 AM				07:45 AM			
+0 mins.	6	93	8	107	11	92	**15**	118	**92**	78	8	178	7	53	**40**	100
+15 mins.	**12**	**99**	5	**116**	**14**	112	13	139	66	80	**9**	155	**18**	61	35	114
+30 mins.	11	87	5	103	10	**132**	15	**157**	86	116	9	211	8	47	31	86
+45 mins.	9	77	**10**	96	6	112	7	125	74	**129**	9	**212**	14	**70**	35	**119**
Total Volume	38	356	28	422	41	448	50	539	318	403	35	756	47	231	141	419
% App. Total	9	84.4	6.6		7.6	83.1	9.3		42.1	53.3	4.6		11.2	55.1	33.7	
PHF	.792	.899	.700	.909	.732	.848	.833	.858	.864	.781	.972	.892	.653	.825	.881	.880

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Weather: Clear

File Name : 01_SLD_E 14th_Davis_Callan PM
Site Code : 22018742
Start Date : 10/4/2018
Page No : 1

Groups Printed- Total Volume

	East 14th Street Southbound				Callan Avenue Westbound				East 14th Street Northbound				Davis Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	15	106	5	126	6	64	15	85	57	111	11	179	11	102	60	173	563
04:15 PM	11	107	11	129	6	71	18	95	56	95	11	162	22	108	59	189	575
04:30 PM	12	115	6	133	7	69	12	88	56	104	6	166	18	109	52	179	566
04:45 PM	15	119	5	139	9	69	3	81	52	117	10	179	22	110	58	190	589
Total	53	447	27	527	28	273	48	349	221	427	38	686	73	429	229	731	2293
05:00 PM	11	105	14	130	11	96	12	119	55	114	10	179	19	120	56	195	623
05:15 PM	9	127	9	145	6	74	5	85	46	122	9	177	22	108	54	184	591
05:30 PM	14	118	11	143	9	77	10	96	59	116	9	184	20	130	48	198	621
05:45 PM	12	97	8	117	9	53	11	73	57	100	12	169	20	118	60	198	557
Total	46	447	42	535	35	300	38	373	217	452	40	709	81	476	218	775	2392
Grand Total	99	894	69	1062	63	573	86	722	438	879	78	1395	154	905	447	1506	4685
Apprch %	9.3	84.2	6.5		8.7	79.4	11.9		31.4	63	5.6		10.2	60.1	29.7		
Total %	2.1	19.1	1.5	22.7	1.3	12.2	1.8	15.4	9.3	18.8	1.7	29.8	3.3	19.3	9.5	32.1	

	East 14th Street Southbound				Callan Avenue Westbound				East 14th Street Northbound				Davis Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	**15**	119	5	139	9	69	3	81	52	117	**10**	179	**22**	110	**58**	190	589
05:00 PM	11	105	**14**	130	**11**	**96**	**12**	**119**	55	114	10	179	19	120	56	195	**623**
05:15 PM	9	**127**	9	**145**	6	74	5	85	46	**122**	9	177	22	108	54	184	591
05:30 PM	14	118	11	143	9	77	10	96	**59**	116	9	**184**	20	**130**	48	**198**	621
Total Volume	49	469	39	557	35	316	30	381	212	469	38	719	83	468	216	767	2424
% App. Total	8.8	84.2	7		9.2	82.9	7.9		29.5	65.2	5.3		10.8	61	28.2		
PHF	.817	.923	.696	.960	.795	.823	.625	.800	.898	.961	.950	.977	.943	.900	.931	.968	.973

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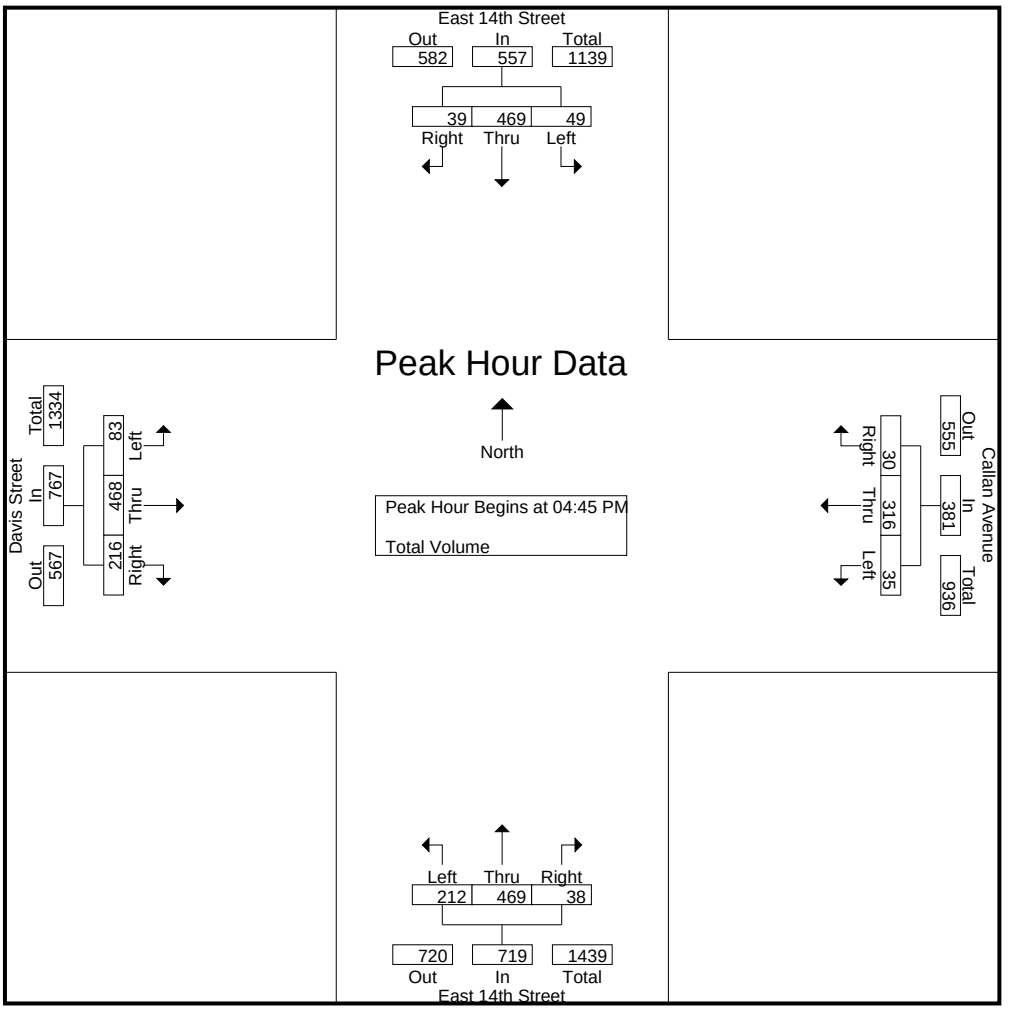
File Name : 01_SLD_E 14th_Davis_Callan PM
Site Code : 22018742
Start Date : 10/4/2018



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:15 PM				04:45 PM				05:00 PM			
+0 mins.	**15**	119	5	139	6	71	**18**	95	52	117	**10**	179	19	120	56	195
+15 mins.	11	105	**14**	130	7	69	12	88	55	114	10	179	**22**	108	54	184
+30 mins.	9	**127**	9	**145**	9	69	3	81	46	**122**	9	177	20	**130**	48	**198**
+45 mins.	14	118	11	143	**11**	**96**	12	**119**	**59**	116	9	**184**	20	118	**60**	198
Total Volume	49	469	39	557	33	305	45	383	212	469	38	719	81	476	218	775
% App. Total	8.8	84.2	7		8.6	79.6	11.7		29.5	65.2	5.3		10.5	61.4	28.1	
PHF	.817	.923	.696	.960	.750	.794	.625	.805	.898	.961	.950	.977	.920	.915	.908	.979

Location: San Leandro
N/S: East 14th Street
E/W: Davis Street/Callan Avenue

Date: 10/4/2018
Day: Thursday

PEDESTRIANS

	North Leg East 14th Street	East Leg Callan Avenue	South Leg East 14th Street	West Leg Davis Street	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
7:00 AM	5	3	3	4	15
7:15 AM	1	5	3	4	13
7:30 AM	3	3	8	10	24
7:45 AM	2	5	8	7	22
8:00 AM	2	2	1	11	16
8:15 AM	0	7	10	5	22
8:30 AM	0	1	7	8	16
8:45 AM	1	5	16	5	27
TOTAL VOLUMES:	14	31	56	54	155

	North Leg East 14th Street	East Leg Callan Avenue	South Leg East 14th Street	West Leg Davis Street	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
4:00 PM	0	7	8	1	16
4:15 PM	5	4	5	7	21
4:30 PM	5	8	2	8	23
4:45 PM	0	5	8	6	19
5:00 PM	3	2	4	6	15
5:15 PM	1	5	8	3	17
5:30 PM	1	8	7	7	23
5:45 PM	2	7	3	6	18
TOTAL VOLUMES:	17	46	45	44	152

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Location: San Leandro
N/S: East 14th Street
E/W: Davis Street/Callan Avenue

Date: 10/4/2018
Day: Thursday

BICYCLES

	Southbound East 14th Street			Westbound Callan Avenue			Northbound East 14th Street			Eastbound Davis Street			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00 AM	0	0	0	0	1	0	0	0	0	0	0	1	2
7:15 AM	0	1	0	0	0	0	0	2	0	0	1	0	4
7:30 AM	0	1	0	0	0	0	0	0	0	0	1	0	2
7:45 AM	0	2	0	0	0	0	0	0	0	0	1	0	3
8:00 AM	0	0	0	0	0	0	0	0	0	0	1	0	1
8:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	2
8:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	2	0	0	0	0	0	0	0	0	0	0	2
TOTAL VOLUMES:	0	8	0	0	2	0	0	2	0	0	4	1	17

	Southbound East 14th Street			Westbound Callan Avenue			Northbound East 14th Street			Eastbound Davis Street			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4:00 PM	0	1	0	0	2	0	0	0	0	0	1	1	5
4:15 PM	0	2	0	0	1	0	0	1	0	0	2	0	6
4:30 PM	0	1	0	0	0	0	0	5	0	0	0	0	6
4:45 PM	0	1	0	0	1	0	0	3	0	0	0	0	5
5:00 PM	0	0	0	0	0	0	0	2	0	0	0	0	2
5:15 PM	0	0	0	0	1	0	0	2	0	0	0	0	3
5:30 PM	0	2	0	0	0	0	0	4	0	0	4	0	10
5:45 PM	0	0	0	0	0	0	0	3	0	0	0	0	3
TOTAL VOLUMES:	0	7	0	0	5	0	0	20	0	0	7	1	40

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City of San Leandro
N/S: East 14th Street
E/W: Washington Plaza Ent/Estudillo Ave
Weather: Clear

File Name : 02_SLD_E 14th_Washington Plaza_Estudillo AM
Site Code : 22018742
Start Date : 10/4/2018
Page No : 1

Groups Printed- Total Volume

	East 14th Street Southbound				Estudillo Avenue Westbound				East 14th Street Northbound				Washington Plaza Entrance Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	24	45	7	76	12	7	41	60	0	60	13	73	3	13	3	19	228
07:15 AM	21	54	4	79	15	13	41	69	4	73	26	103	3	14	3	20	271
07:30 AM	20	86	7	113	36	6	58	100	8	89	17	114	3	22	3	28	355
07:45 AM	24	118	12	154	37	17	64	118	5	118	28	151	3	19	2	24	447
Total	89	303	30	422	100	43	204	347	17	340	84	441	12	68	11	91	1301
08:00 AM	21	94	13	128	45	17	61	123	7	125	32	164	8	34	2	44	459
08:15 AM	26	85	17	128	42	12	60	114	15	151	30	196	10	24	5	39	477
08:30 AM	27	77	10	114	25	14	52	91	6	78	18	102	8	15	2	25	332
08:45 AM	25	71	12	108	20	16	43	79	8	86	26	120	7	13	4	24	331
Total	99	327	52	478	132	59	216	407	36	440	106	582	33	86	13	132	1599
Grand Total	188	630	82	900	232	102	420	754	53	780	190	1023	45	154	24	223	2900
Apprch %	20.9	70	9.1		30.8	13.5	55.7		5.2	76.2	18.6		20.2	69.1	10.8		
Total %	6.5	21.7	2.8	31	8	3.5	14.5	26	1.8	26.9	6.6	35.3	1.6	5.3	0.8	7.7	

	East 14th Street Southbound				Estudillo Avenue Westbound				East 14th Street Northbound				Washington Plaza Entrance Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	20	86	7	113	36	6	58	100	8	89	17	114	3	22	3	28	355
07:45 AM	24	**118**	12	**154**	37	**17**	**64**	118	5	118	28	151	3	19	2	24	447
08:00 AM	21	94	13	128	**45**	17	61	**123**	7	125	**32**	164	8	**34**	2	**44**	459
08:15 AM	**26**	85	**17**	128	42	12	60	114	**15**	**151**	30	**196**	**10**	24	**5**	39	**477**
Total Volume	91	383	49	523	160	52	243	455	35	483	107	625	24	99	12	135	1738
% App. Total	17.4	73.2	9.4		35.2	11.4	53.4		5.6	77.3	17.1		17.8	73.3	8.9		
PHF	.875	.811	.721	.849	.889	.765	.949	.925	.583	.800	.836	.797	.600	.728	.600	.767	.911

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Weather: Clear

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Start Date : 10/4/2018
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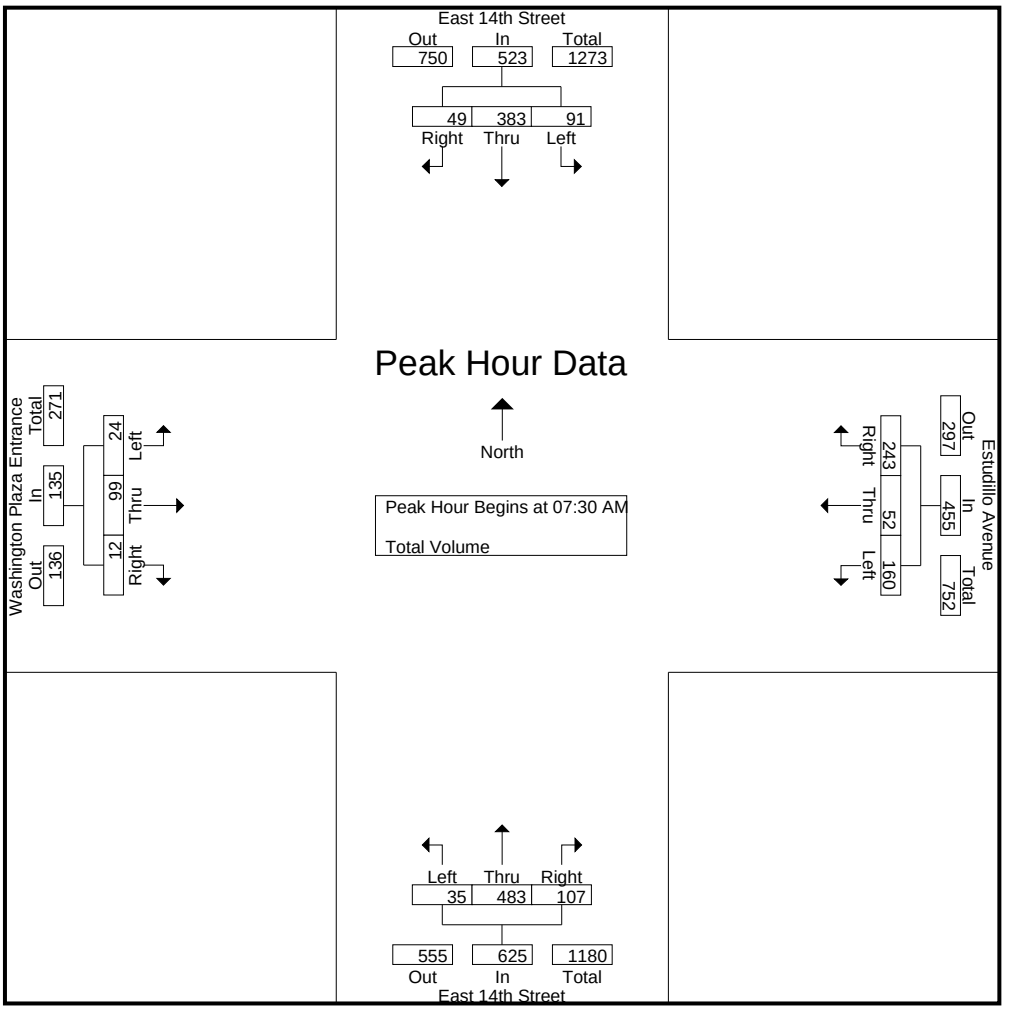

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	24	**118**	12	**154**	36	6	58	100	8	89	17	114	3	22	3	28
+15 mins.	21	94	13	128	37	**17**	**64**	118	5	118	28	151	3	19	2	24
+30 mins.	26	85	**17**	128	**45**	17	61	**123**	7	125	**32**	164	8	**34**	2	**44**
+45 mins.	**27**	77	10	114	42	12	60	114	**15**	**151**	30	**196**	**10**	24	**5**	39
Total Volume	98	374	52	524	160	52	243	455	35	483	107	625	24	99	12	135
% App. Total	18.7	71.4	9.9		35.2	11.4	53.4		5.6	77.3	17.1		17.8	73.3	8.9	
PHF	.907	.792	.765	.851	.889	.765	.949	.925	.583	.800	.836	.797	.600	.728	.600	.767

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City of San Leandro
N/S: East 14th Street
E/W: Washington Plaza Ent/Estudillo Ave
Weather: Clear

File Name : 02_SLD_E 14th_Washington Plaza_Estudillo PM
Site Code : 22018742
Start Date : 10/4/2018
Page No : 1

Groups Printed- Total Volume

	East 14th Street Southbound				Estudillo Avenue Westbound				East 14th Street Northbound				Washington Plaza Entrance Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	40	112	20	172	29	43	31	103	17	128	34	179	27	53	13	93	547
04:15 PM	46	100	20	166	29	27	37	93	13	105	34	152	20	37	5	62	473
04:30 PM	52	98	18	168	36	32	33	101	13	110	25	148	24	41	9	74	491
04:45 PM	46	118	31	195	38	32	41	111	5	125	31	161	21	32	7	60	527
Total	184	428	89	701	132	134	142	408	48	468	124	640	92	163	34	289	2038
05:00 PM	36	104	27	167	38	28	33	99	7	133	21	161	24	29	10	63	490
05:15 PM	50	122	26	198	35	35	26	96	12	127	28	167	18	32	6	56	517
05:30 PM	37	104	25	166	30	28	37	95	12	125	19	156	23	41	8	72	489
05:45 PM	37	107	24	168	35	27	24	86	8	102	19	129	25	36	4	65	448
Total	160	437	102	699	138	118	120	376	39	487	87	613	90	138	28	256	1944
Grand Total	344	865	191	1400	270	252	262	784	87	955	211	1253	182	301	62	545	3982
Apprch %	24.6	61.8	13.6		34.4	32.1	33.4		6.9	76.2	16.8		33.4	55.2	11.4		
Total %	8.6	21.7	4.8	35.2	6.8	6.3	6.6	19.7	2.2	24	5.3	31.5	4.6	7.6	1.6	13.7	

	East 14th Street Southbound				Estudillo Avenue Westbound				East 14th Street Northbound				Washington Plaza Entrance Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	40	112	20	172	29	**43**	31	103	**17**	**128**	**34**	**179**	**27**	**53**	**13**	**93**	**547**
04:15 PM	46	100	20	166	29	27	37	93	13	105	34	152	20	37	5	62	473
04:30 PM	**52**	98	18	168	36	32	33	101	13	110	25	148	24	41	9	74	491
04:45 PM	46	**118**	**31**	**195**	**38**	32	**41**	**111**	5	125	31	161	21	32	7	60	527
Total Volume	184	428	89	701	132	134	142	408	48	468	124	640	92	163	34	289	2038
% App. Total	26.2	61.1	12.7		32.4	32.8	34.8		7.5	73.1	19.4		31.8	56.4	11.8		
PHF	.885	.907	.718	.899	.868	.779	.866	.919	.706	.914	.912	.894	.852	.769	.654	.777	.931

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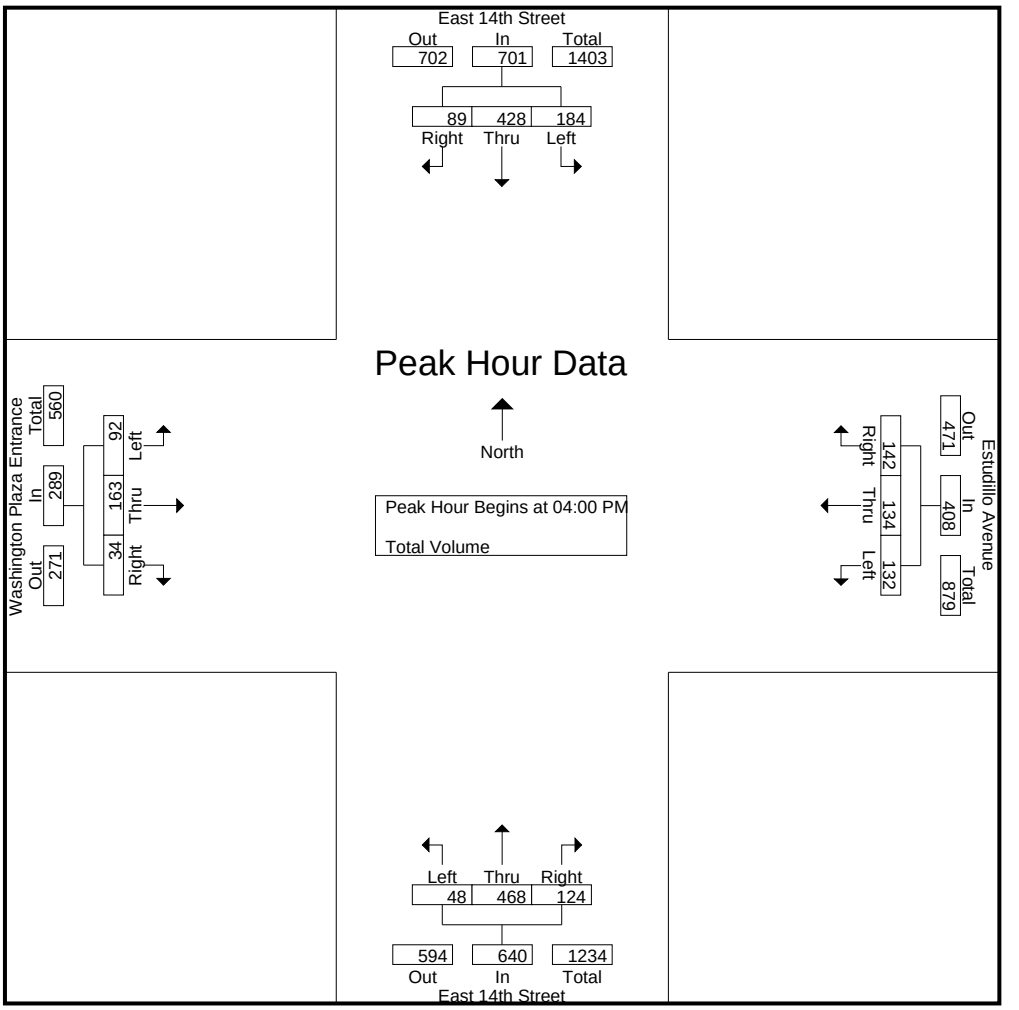
City of San Leandro
N/S: East 14th Street
E/W: Washington Plaza Ent/Estudillo Ave
Weather: Clear

File Name : 02_SLD_E 14th_Washington Plaza_Estudillo PM
Site Code : 22018742
Start Date : 10/4/2018
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM				04:00 PM				04:45 PM				04:00 PM			
+0 mins.	**52**	98	18	168	29	**43**	31	103	5	125	**31**	161	**27**	**53**	**13**	**93**
+15 mins.	46	118	**31**	195	29	27	37	93	7	**133**	21	161	20	37	5	62
+30 mins.	36	104	27	167	36	32	33	101	**12**	127	28	**167**	24	41	9	74
+45 mins.	50	**122**	26	**198**	**38**	32	**41**	**111**	12	125	19	156	21	32	7	60
Total Volume	184	442	102	728	132	134	142	408	36	510	99	645	92	163	34	289
% App. Total	25.3	60.7	14		32.4	32.8	34.8		5.6	79.1	15.3		31.8	56.4	11.8	
PHF	.885	.906	.823	.919	.868	.779	.866	.919	.750	.959	.798	.966	.852	.769	.654	.777

Location: San Leandro
N/S: East 14th Street
E/W: Washington Plaza Ent/Estudillo Ave

Date: 10/4/2018
Day: Thursday

PEDESTRIANS

	North Leg East 14th Street	East Leg Estudillo Avenue	South Leg East 14th Street	West Leg Washington Plaza Ent	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
7:00 AM	3	1	2	1	7
7:15 AM	9	3	1	1	14
7:30 AM	8	1	2	3	14
7:45 AM	6	3	1	3	13
8:00 AM	17	2	7	4	30
8:15 AM	8	3	1	1	13
8:30 AM	8	2	0	0	10
8:45 AM	13	2	5	3	23
TOTAL VOLUMES:	72	17	19	16	124

	North Leg East 14th Street	East Leg Estudillo Avenue	South Leg East 14th Street	West Leg Washington Plaza Ent	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
4:00 PM	15	4	7	1	27
4:15 PM	16	12	10	5	43
4:30 PM	23	7	5	7	42
4:45 PM	21	6	2	7	36
5:00 PM	13	12	7	20	52
5:15 PM	6	2	4	4	16
5:30 PM	16	11	4	4	35
5:45 PM	5	7	4	3	19
TOTAL VOLUMES:	115	61	43	51	270

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Location: San Leandro
N/S: East 14th Street
E/W: Washington Plaza Ent/Estudillo Ave

Date: 10/4/2018
Day: Thursday

BICYCLES

	Southbound East 14th Street			Westbound Estudillo Avenue			Northbound East 14th Street			Eastbound Washington Plaza Ent			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	1	0	0	3	0	0	0	0	0	0	0	4
7:30 AM	0	2	0	0	2	0	0	1	0	0	1	0	6
7:45 AM	0	1	0	0	2	0	0	0	0	0	0	0	3
8:00 AM	0	0	0	0	1	0	0	0	0	0	3	0	4
8:15 AM	0	2	0	0	3	0	0	0	0	0	1	0	6
8:30 AM	0	0	0	0	1	0	0	0	0	0	0	0	1
8:45 AM	0	2	0	0	2	0	0	0	0	0	1	0	5
TOTAL VOLUMES:	0	9	0	0	14	0	0	1	0	0	6	0	30

	Southbound East 14th Street			Westbound Estudillo Avenue			Northbound East 14th Street			Eastbound Washington Plaza Ent			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4:00 PM	0	1	0	0	1	0	0	1	0	0	2	0	5
4:15 PM	0	2	0	0	1	0	0	1	0	0	3	0	7
4:30 PM	0	0	0	1	3	0	0	1	0	0	2	0	7
4:45 PM	0	1	1	0	1	0	0	1	0	0	4	0	8
5:00 PM	0	0	0	0	0	0	0	2	0	0	4	0	6
5:15 PM	0	0	0	0	1	0	0	1	1	0	2	0	5
5:30 PM	0	0	0	0	1	0	0	3	0	0	2	0	6
5:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	2
TOTAL VOLUMES:	0	4	1	1	9	0	0	11	1	0	19	0	46

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City of San Leandro
N/S: East 14th Street
E/W: Dan Niemi Way/Chumalia Street
Weather: Clear

File Name : 03_SLD_E 14th_Chumalia_Dan AM
Site Code : 22018742
Start Date : 10/4/2018
Page No : 1

Groups Printed- Total Volume

	East 14th Street Southbound				Chumalia Street Westbound				East 14th Street Northbound				Dan Niemi Way Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	2	55	63	120	1	7	5	13	2	70	1	73	10	1	0	11	217
07:15 AM	1	66	76	143	2	4	6	12	1	58	1	60	11	1	0	12	227
07:30 AM	1	84	79	164	2	11	7	20	5	81	0	86	20	0	0	20	290
07:45 AM	2	125	100	227	5	7	10	22	2	91	1	94	22	0	0	22	365
Total	6	330	318	654	10	29	28	67	10	300	3	313	63	2	0	65	1099
08:00 AM	2	112	81	195	1	3	10	14	9	134	0	143	40	0	2	42	394
08:15 AM	3	88	89	180	1	5	10	16	6	149	2	157	28	1	2	31	384
08:30 AM	3	91	68	162	1	3	9	13	2	102	3	107	18	0	1	19	301
08:45 AM	2	76	51	129	0	1	2	3	3	89	3	95	25	0	0	25	252
Total	10	367	289	666	3	12	31	46	20	474	8	502	111	1	5	117	1331
Grand Total	16	697	607	1320	13	41	59	113	30	774	11	815	174	3	5	182	2430
Apprch %	1.2	52.8	46		11.5	36.3	52.2		3.7	95	1.3		95.6	1.6	2.7		
Total %	0.7	28.7	25	54.3	0.5	1.7	2.4	4.7	1.2	31.9	0.5	33.5	7.2	0.1	0.2	7.5	

	East 14th Street Southbound				Chumalia Street Westbound				East 14th Street Northbound				Dan Niemi Way Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	2	**125**	**100**	**227**	**5**	**7**	**10**	**22**	2	91	1	94	22	0	0	22	365
08:00 AM	2	112	81	195	1	3	10	14	**9**	134	0	143	**40**	0	**2**	**42**	**394**
08:15 AM	**3**	88	89	180	1	5	10	16	6	**149**	2	**157**	28	**1**	2	31	384
08:30 AM	3	91	68	162	1	3	9	13	2	102	**3**	107	18	0	1	19	301
Total Volume	10	416	338	764	8	18	39	65	19	476	6	501	108	1	5	114	1444
% App. Total	1.3	54.5	44.2		12.3	27.7	60		3.8	95	1.2		94.7	0.9	4.4		
PHF	.833	.832	.845	.841	.400	.643	.975	.739	.528	.799	.500	.798	.675	.250	.625	.679	.916

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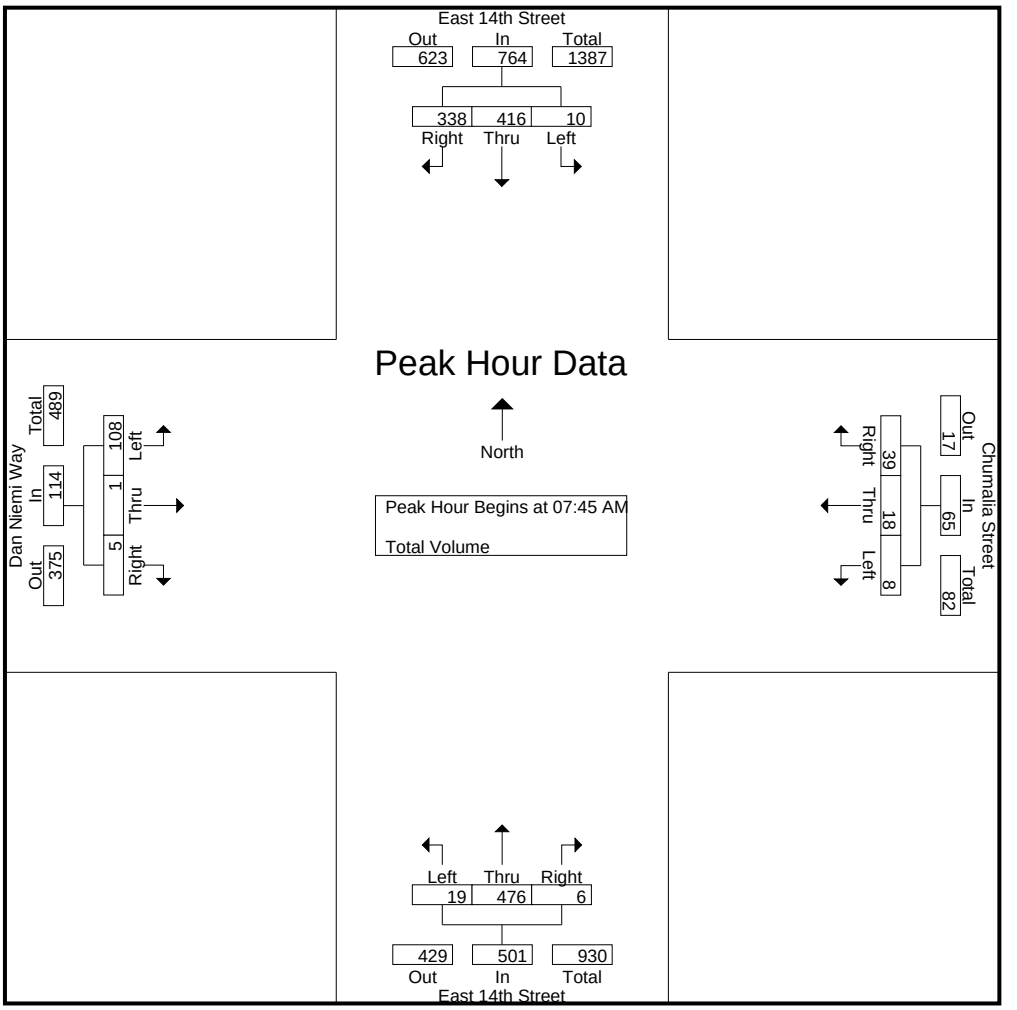
City of San Leandro
N/S: East 14th Street
E/W: Dan Niemi Way/Chumalia Street
Weather: Clear

File Name : 03_SLD_E 14th_Chumalia_Dan AM
Site Code : 22018742
Start Date : 10/4/2018
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				08:00 AM				08:00 AM			
+0 mins.	1	84	79	164	2	**11**	7	20	**9**	134	0	143	**40**	0	**2**	**42**
+15 mins.	2	**125**	**100**	**227**	**5**	7	**10**	**22**	6	**149**	2	**157**	28	**1**	2	31
+30 mins.	2	112	81	195	1	3	10	14	2	102	**3**	107	18	0	1	19
+45 mins.	**3**	88	89	180	1	5	10	16	3	89	3	95	25	0	0	25
Total Volume	8	409	349	766	9	26	37	72	20	474	8	502	111	1	5	117
% App. Total	1	53.4	45.6		12.5	36.1	51.4		4	94.4	1.6		94.9	0.9	4.3	
PHF	.667	.818	.873	.844	.450	.591	.925	.818	.556	.795	.667	.799	.694	.250	.625	.696

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City of San Leandro
N/S: East 14th Street
E/W: Dan Niemi Way/Chumalia Street
Weather: Clear

File Name : 03_SLD_E 14th_Chumalia_Dan PM
Site Code : 22018742
Start Date : 10/4/2018
Page No : 1

Groups Printed- Total Volume

	East 14th Street Southbound				Chumalia Street Westbound				East 14th Street Northbound				Dan Niemi Way Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	1	120	56	177	3	1	1	5	1	125	0	126	48	5	2	55	363
04:15 PM	1	127	50	178	1	1	5	7	2	147	0	149	58	7	1	66	400
04:30 PM	5	132	53	190	4	14	46	64	3	132	0	135	32	12	13	57	446
04:45 PM	3	117	55	175	4	13	53	70	7	114	1	122	29	17	16	62	429
Total	10	496	214	720	12	29	105	146	13	518	1	532	167	41	32	240	1638
05:00 PM	6	134	58	198	2	12	49	63	12	156	0	168	27	20	17	64	493
05:15 PM	5	128	53	186	0	13	53	66	6	126	0	132	26	18	20	64	448
05:30 PM	5	143	71	219	3	14	70	87	5	141	1	147	27	17	19	63	516
05:45 PM	0	115	54	169	2	11	52	65	5	114	1	120	19	18	14	51	405
Total	16	520	236	772	7	50	224	281	28	537	2	567	99	73	70	242	1862
Grand Total	26	1016	450	1492	19	79	329	427	41	1055	3	1099	266	114	102	482	3500
Apprch %	1.7	68.1	30.2		4.4	18.5	77		3.7	96	0.3		55.2	23.7	21.2		
Total %	0.7	29	12.9	42.6	0.5	2.3	9.4	12.2	1.2	30.1	0.1	31.4	7.6	3.3	2.9	13.8	

	East 14th Street Southbound				Chumalia Street Westbound				East 14th Street Northbound				Dan Niemi Way Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	3	117	55	175	**4**	13	53	70	7	114	**1**	122	**29**	17	16	62	429
05:00 PM	**6**	134	58	198	2	12	49	63	**12**	**156**	0	**168**	27	**20**	17	**64**	493
05:15 PM	5	128	53	186	0	13	53	66	6	126	0	132	26	18	**20**	64	448
05:30 PM	5	**143**	**71**	**219**	3	**14**	**70**	**87**	5	141	1	147	27	17	19	63	**516**
Total Volume	19	522	237	778	9	52	225	286	30	537	2	569	109	72	72	253	1886
% App. Total	2.4	67.1	30.5		3.1	18.2	78.7		5.3	94.4	0.4		43.1	28.5	28.5		
PHF	.792	.913	.835	.888	.563	.929	.804	.822	.625	.861	.500	.847	.940	.900	.900	.988	.914

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City of San Leandro
N/S: East 14th Street
E/W: Dan Niemi Way/Chumalia Street
Weather: Clear

File Name : 03_SLD_E 14th_Chumalia_Dan PM
Site Code : 22018742
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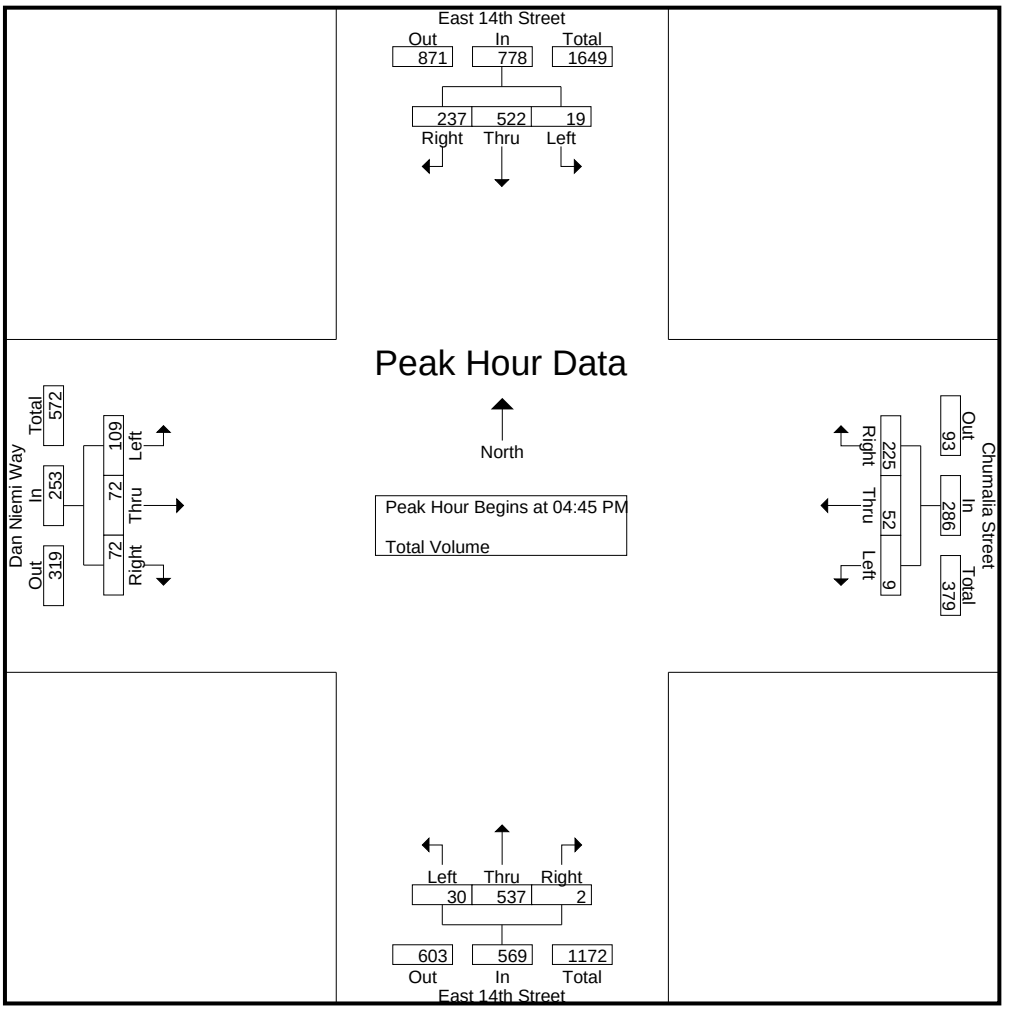

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:15 PM				04:45 PM			
+0 mins.	3	117	55	175	**4**	13	53	70	2	147	0	149	**29**	17	16	62
+15 mins.	**6**	134	58	198	2	12	49	63	3	132	0	135	27	**20**	17	**64**
+30 mins.	5	128	53	186	0	13	53	66	7	114	**1**	122	26	18	**20**	64
+45 mins.	5	**143**	**71**	**219**	3	**14**	**70**	**87**	**12**	**156**	0	**168**	27	17	19	63
Total Volume	19	522	237	778	9	52	225	286	24	549	1	574	109	72	72	253
% App. Total	2.4	67.1	30.5		3.1	18.2	78.7		4.2	95.6	0.2		43.1	28.5	28.5	
PHF	.792	.913	.835	.888	.563	.929	.804	.822	.500	.880	.250	.854	.940	.900	.900	.988

Location: San Leandro
N/S: East 14th Street
E/W: Dan Niemi Way/Chumalia Street

Date: 10/4/2018
Day: Thursday

PEDESTRIANS

	North Leg East 14th Street	East Leg Chumalia Street	South Leg East 14th Street	West Leg Dan Niemi Way	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
7:00 AM	0	6	3	2	11
7:15 AM	0	4	1	3	8
7:30 AM	0	8	5	14	27
7:45 AM	0	10	0	8	18
8:00 AM	0	4	2	10	16
8:15 AM	0	9	2	10	21
8:30 AM	0	5	5	8	18
8:45 AM	0	1	2	4	7
TOTAL VOLUMES:	0	47	20	59	126

	North Leg East 14th Street	East Leg Chumalia Street	South Leg East 14th Street	West Leg Dan Niemi Way	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
4:00 PM	0	6	4	3	13
4:15 PM	0	7	3	5	15
4:30 PM	0	0	0	0	0
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	0	0	0	0	0
5:30 PM	0	0	0	0	0
5:45 PM	0	0	0	0	0
TOTAL VOLUMES:	0	13	7	8	28

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Location: San Leandro
N/S: East 14th Street
E/W: Dan Niemi Way/Chumalia Street

Date: 10/4/2018
Day: Thursday

BICYCLES

	Southbound East 14th Street			Westbound Chumalia Street			Northbound East 14th Street			Eastbound Dan Niemi Way			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00 AM	0	1	1	0	0	0	0	0	0	0	0	0	2
7:15 AM	2	1	2	0	0	0	0	2	0	1	0	0	8
7:30 AM	0	1	0	0	0	1	0	0	0	0	0	0	2
7:45 AM	0	3	2	0	0	0	0	1	0	1	1	0	8
8:00 AM	0	1	0	0	1	0	0	0	0	0	0	0	2
8:15 AM	0	1	1	0	0	0	0	0	0	0	0	0	2
8:30 AM	0	1	0	0	1	0	0	0	0	0	0	0	2
8:45 AM	0	2	2	0	0	0	0	0	0	0	0	0	4
TOTAL VOLUMES:	2	11	8	0	2	1	0	3	0	2	1	0	30

	Southbound East 14th Street			Westbound Chumalia Street			Northbound East 14th Street			Eastbound Dan Niemi Way			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4:00 PM	0	2	1	0	0	0	0	1	0	1	0	0	5
4:15 PM	0	2	0	0	0	0	0	1	0	0	0	0	3
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	0	4	1	0	0	0	0	2	0	1	0	0	8

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City of San Leandro
N/S: Dan Niemi Way/Hays Street
E/W: Davis Street
Weather: Clear

File Name : 04_SLD_Dan_Hays_Davis AM
Site Code : 22018742
Start Date : 10/4/2018
Page No : 1

Groups Printed- Total Volume

	Dan Niemi Way Southbound				Davis Street Westbound				Hays Street Northbound				Davis Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	2	10	57	69	0	143	0	143	10	1	6	17	7	79	3	89	318
07:15 AM	1	7	61	69	0	162	1	163	15	3	3	21	13	73	7	93	346
07:30 AM	1	14	84	99	2	191	1	194	28	6	5	39	10	90	4	104	436
07:45 AM	0	16	91	107	3	194	0	197	19	13	6	38	15	107	6	128	470
Total	4	47	293	344	5	690	2	697	72	23	20	115	45	349	20	414	1570
08:00 AM	0	16	73	89	3	173	0	176	38	13	13	64	30	114	10	154	483
08:15 AM	1	16	70	87	2	192	1	195	30	14	4	48	11	81	16	108	438
08:30 AM	0	11	54	65	1	196	1	198	26	10	4	40	12	108	8	128	431
08:45 AM	0	6	47	53	2	157	1	160	23	9	4	36	17	102	12	131	380
Total	1	49	244	294	8	718	3	729	117	46	25	188	70	405	46	521	1732
Grand Total	5	96	537	638	13	1408	5	1426	189	69	45	303	115	754	66	935	3302
Apprch %	0.8	15	84.2		0.9	98.7	0.4		62.4	22.8	14.9		12.3	80.6	7.1		
Total %	0.2	2.9	16.3	19.3	0.4	42.6	0.2	43.2	5.7	2.1	1.4	9.2	3.5	22.8	2	28.3	

	Dan Niemi Way Southbound				Davis Street Westbound				Hays Street Northbound				Davis Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	**1**	14	84	99	2	191	**1**	194	28	6	5	39	10	90	4	104	436
07:45 AM	0	**16**	**91**	**107**	**3**	**194**	0	**197**	19	13	6	38	15	107	6	128	470
08:00 AM	0	16	73	89	3	173	0	176	**38**	13	**13**	**64**	**30**	**114**	10	**154**	**483**
08:15 AM	1	16	70	87	2	192	1	195	30	**14**	4	48	11	81	**16**	108	438
Total Volume	2	62	318	382	10	750	2	762	115	46	28	189	66	392	36	494	1827
% App. Total	0.5	16.2	83.2		1.3	98.4	0.3		60.8	24.3	14.8		13.4	79.4	7.3		
PHF	.500	.969	.874	.893	.833	.966	.500	.967	.757	.821	.538	.738	.550	.860	.563	.802	.946

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City of San Leandro
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Weather: Clear

File Name : 04_SLD_Dan_Hays_Davis AM
Site Code : 22018742
Start Date : 10/4/2018
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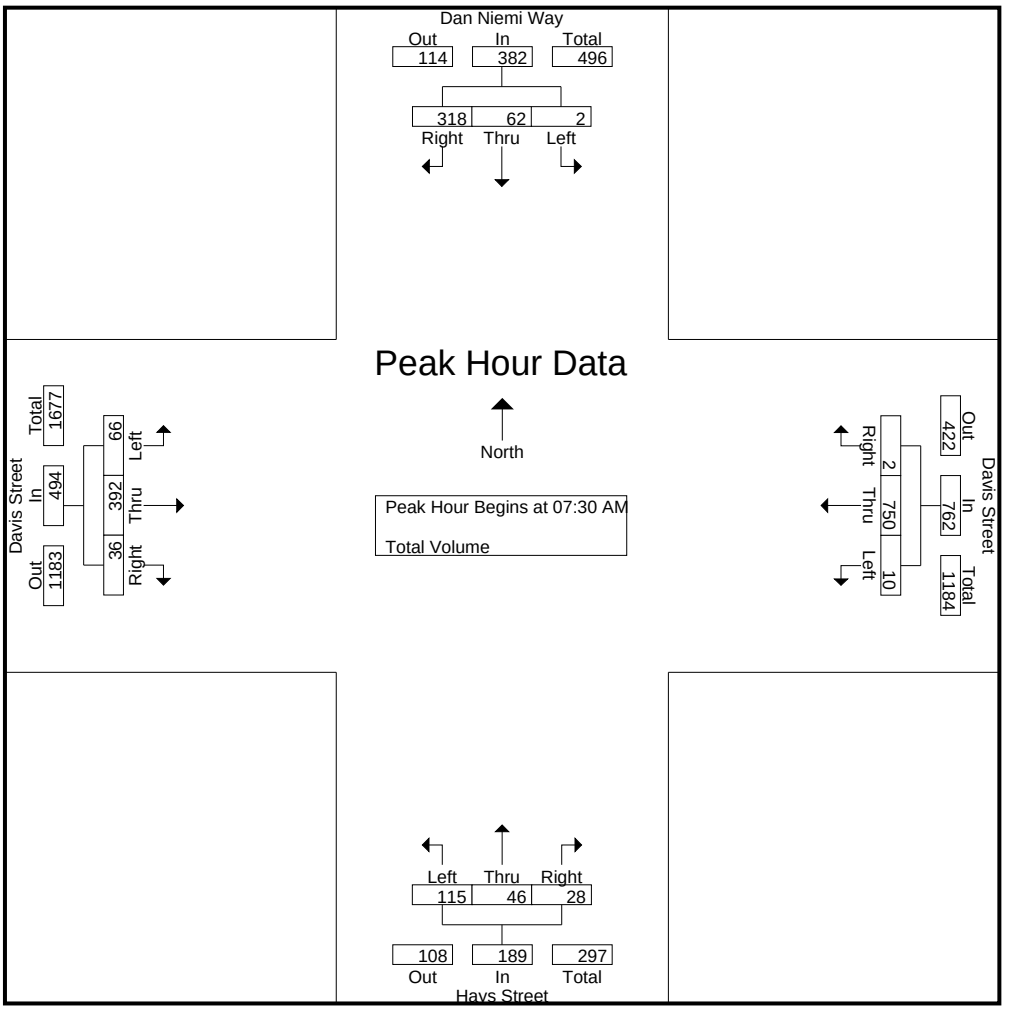

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:30 AM				07:45 AM				07:45 AM				08:00 AM			
+0 mins.	**1**	14	84	99	**3**	194	0	197	19	13	6	38	**30**	**114**	10	**154**
+15 mins.	0	**16**	**91**	**107**	3	173	0	176	**38**	13	**13**	**64**	11	81	**16**	108
+30 mins.	0	16	73	89	2	192	**1**	195	30	**14**	4	48	12	108	8	128
+45 mins.	1	16	70	87	1	**196**	1	**198**	26	10	4	40	17	102	12	131
Total Volume	2	62	318	382	9	755	2	766	113	50	27	190	70	405	46	521
% App. Total	0.5	16.2	83.2		1.2	98.6	0.3		59.5	26.3	14.2		13.4	77.7	8.8	
PHF	.500	.969	.874	.893	.750	.963	.500	.967	.743	.893	.519	.742	.583	.888	.719	.846

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City of San Leandro
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File Name : 04_SLD_Dan_Hays_Davis PM
Site Code : 22018742
Start Date : 10/4/2018
Page No : 1

Groups Printed- Total Volume

	Dan Niemi Way Southbound				Davis Street Westbound				Hays Street Northbound				Davis Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	1	12	53	66	7	117	3	127	28	22	10	60	35	179	33	247	500
04:15 PM	0	17	42	59	7	128	0	135	22	23	11	56	41	162	33	236	486
04:30 PM	3	14	45	62	4	128	0	132	32	12	13	57	46	182	30	258	509
04:45 PM	4	12	52	68	6	115	1	122	29	16	16	61	30	173	39	242	493
Total	8	55	192	255	24	488	4	516	111	73	50	234	152	696	135	983	1988
05:00 PM	1	12	49	62	12	149	0	161	27	17	17	61	43	187	30	260	544
05:15 PM	0	13	53	66	6	122	0	128	26	16	20	62	41	179	20	240	496
05:30 PM	3	14	69	86	5	134	1	140	27	17	20	64	42	176	32	250	540
05:45 PM	2	11	52	65	5	113	1	119	19	18	14	51	48	213	27	288	523
Total	6	50	223	279	28	518	2	548	99	68	71	238	174	755	109	1038	2103
Grand Total	14	105	415	534	52	1006	6	1064	210	141	121	472	326	1451	244	2021	4091
Apprch %	2.6	19.7	77.7		4.9	94.5	0.6		44.5	29.9	25.6		16.1	71.8	12.1		
Total %	0.3	2.6	10.1	13.1	1.3	24.6	0.1	26	5.1	3.4	3	11.5	8	35.5	6	49.4	

	Dan Niemi Way Southbound				Davis Street Westbound				Hays Street Northbound				Davis Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	1	12	49	62	**12**	**149**	0	**161**	**27**	17	17	61	43	187	30	260	**544**
05:15 PM	0	13	53	66	6	122	0	128	26	16	**20**	62	41	179	20	240	496
05:30 PM	**3**	**14**	**69**	**86**	5	134	**1**	140	27	17	20	**64**	42	176	**32**	250	540
05:45 PM	2	11	52	65	5	113	1	119	19	**18**	14	51	**48**	**213**	27	**288**	523
Total Volume	6	50	223	279	28	518	2	548	99	68	71	238	174	755	109	1038	2103
% App. Total	2.2	17.9	79.9		5.1	94.5	0.4		41.6	28.6	29.8		16.8	72.7	10.5		
PHF	.500	.893	.808	.811	.583	.869	.500	.851	.917	.944	.888	.930	.906	.886	.852	.901	.966

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City of San Leandro
N/S: Dan Niemi Way/Hays Street
E/W: Davis Street
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File Name : 04_SLD_Dan_Hays_Davis PM
Site Code : 22018742
Start Date : 10/4/2018
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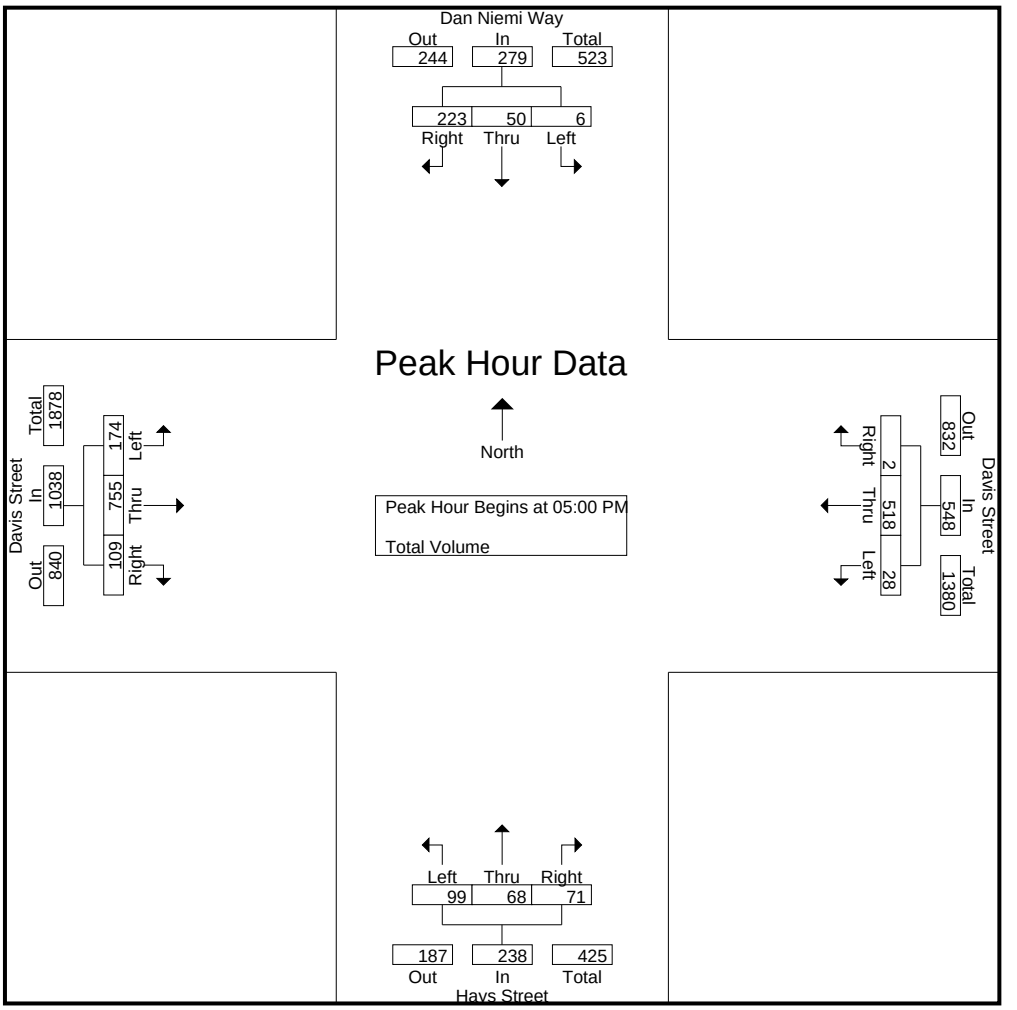

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:45 PM				05:00 PM			
+0 mins.	**4**	12	52	68	6	115	**1**	122	**29**	16	16	61	43	187	30	260
+15 mins.	1	12	49	62	**12**	**149**	0	**161**	27	**17**	17	61	41	179	20	240
+30 mins.	0	13	53	66	6	122	0	128	26	16	**20**	62	42	176	**32**	250
+45 mins.	3	**14**	**69**	**86**	5	134	1	140	27	17	20	**64**	**48**	**213**	27	**288**
Total Volume	8	51	223	282	29	520	2	551	109	66	73	248	174	755	109	1038
% App. Total	2.8	18.1	79.1		5.3	94.4	0.4		44	26.6	29.4		16.8	72.7	10.5	
PHF	.500	.911	.808	.820	.604	.872	.500	.856	.940	.971	.913	.969	.906	.886	.852	.901

Location: San Leandro
N/S: Dan Niemi Way/Hays Street
E/W: Davis Street

Date: 10/4/2018
Day: Thursday

PEDESTRIANS

	North Leg Dan Niemi Way	East Leg Davis Street	South Leg Hays Street	West Leg Davis Street	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
7:00 AM	4	1	1	1	7
7:15 AM	3	1	1	0	5
7:30 AM	4	1	4	8	17
7:45 AM	2	2	3	4	11
8:00 AM	2	7	3	7	19
8:15 AM	8	4	3	2	17
8:30 AM	3	3	9	3	18
8:45 AM	1	2	2	2	7
TOTAL VOLUMES:	27	21	26	27	101

	North Leg Dan Niemi Way	East Leg Davis Street	South Leg Hays Street	West Leg Davis Street	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
4:00 PM	5	7	4	5	21
4:15 PM	5	1	5	5	16
4:30 PM	7	4	8	5	24
4:45 PM	4	4	11	7	26
5:00 PM	4	1	10	5	20
5:15 PM	4	11	2	3	20
5:30 PM	1	5	10	4	20
5:45 PM	6	5	8	6	25
TOTAL VOLUMES:	36	38	58	40	172

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Location: San Leandro
N/S: Dan Niemi Way/Hays Street
E/W: Davis Street

Date: 10/4/2018
Day: Thursday

BICYCLES

	Southbound Dan Niemi Way			Westbound Davis Street			Northbound Hays Street			Eastbound Davis Street			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00 AM	0	1	1	0	1	0	0	0	0	0	1	1	5
7:15 AM	0	0	2	0	0	0	0	1	0	0	1	0	4
7:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
7:45 AM	0	2	0	0	0	0	0	1	0	1	1	0	5
8:00 AM	0	0	2	0	0	0	1	0	0	0	0	0	3
8:15 AM	0	0	1	1	0	0	0	0	0	0	0	0	2
8:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
8:45 AM	0	2	0	0	0	0	0	0	0	0	0	0	2
TOTAL VOLUMES:	0	7	6	1	1	0	1	2	0	1	3	1	23

	Southbound Dan Niemi Way			Westbound Davis Street			Northbound Hays Street			Eastbound Davis Street			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4:00 PM	0	1	0	0	3	0	0	1	0	0	0	0	5
4:15 PM	0	0	0	0	0	0	0	2	0	0	1	0	3
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	2
5:00 PM	0	0	0	0	1	0	1	0	0	0	0	0	2
5:15 PM	0	0	0	0	1	0	0	1	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	1	1	0	1	0	3
5:45 PM	0	0	0	0	0	0	0	3	0	0	1	0	4
TOTAL VOLUMES:	0	2	0	0	6	0	1	8	1	0	3	0	21

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City of San Leandro
N/S: Bancroft Avenue
E/W: Callan Avenue
Weather: Clear

File Name : 05_SLD_Bancroft_Callan AM
Site Code : 22018742
Start Date : 10/4/2018
Page No : 1

Groups Printed- Total Volume

	Bancroft Avenue Southbound				Bancroft Middle School Driveway Westbound				Bancroft Avenue Northbound				Callan Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	2	72	37	111	3	0	1	4	67	39	5	111	21	0	22	43	269
07:15 AM	10	76	30	116	4	4	6	14	77	70	10	157	23	4	32	59	346
07:30 AM	11	81	36	128	15	0	5	20	71	79	17	167	26	6	24	56	371
07:45 AM	12	113	54	179	10	1	7	18	62	93	4	159	38	2	29	69	425
Total	35	342	157	534	32	5	19	56	277	281	36	594	108	12	107	227	1411
08:00 AM	4	129	65	198	1	2	3	6	79	137	2	218	51	2	42	95	517
08:15 AM	5	79	36	120	2	4	5	11	51	73	3	127	16	1	19	36	294
08:30 AM	2	73	55	130	1	0	2	3	86	65	1	152	30	0	28	58	343
08:45 AM	0	77	44	121	0	0	0	0	76	58	0	134	23	0	19	42	297
Total	11	358	200	569	4	6	10	20	292	333	6	631	120	3	108	231	1451
Grand Total	46	700	357	1103	36	11	29	76	569	614	42	1225	228	15	215	458	2862
Apprch %	4.2	63.5	32.4		47.4	14.5	38.2		46.4	50.1	3.4		49.8	3.3	46.9		
Total %	1.6	24.5	12.5	38.5	1.3	0.4	1	2.7	19.9	21.5	1.5	42.8	8	0.5	7.5	16	

	Bancroft Avenue Southbound				Bancroft Middle School Driveway Westbound				Bancroft Avenue Northbound				Callan Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	10	76	30	116	4	**4**	6	14	77	70	10	157	23	4	32	59	346
07:30 AM	11	81	36	128	**15**	0	5	**20**	71	79	**17**	167	26	**6**	24	56	371
07:45 AM	**12**	113	54	179	10	1	**7**	18	62	93	4	159	38	2	29	69	425
08:00 AM	4	**129**	**65**	**198**	1	2	3	6	**79**	**137**	2	**218**	**51**	2	**42**	**95**	**517**
Total Volume	37	399	185	621	30	7	21	58	289	379	33	701	138	14	127	279	1659
% App. Total	6	64.3	29.8		51.7	12.1	36.2		41.2	54.1	4.7		49.5	5	45.5		
PHF	.771	.773	.712	.784	.500	.438	.750	.725	.915	.692	.485	.804	.676	.583	.756	.734	.802

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City of San Leandro
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File Name : 05_SLD_Bancroft_Callan AM
Site Code : 22018742
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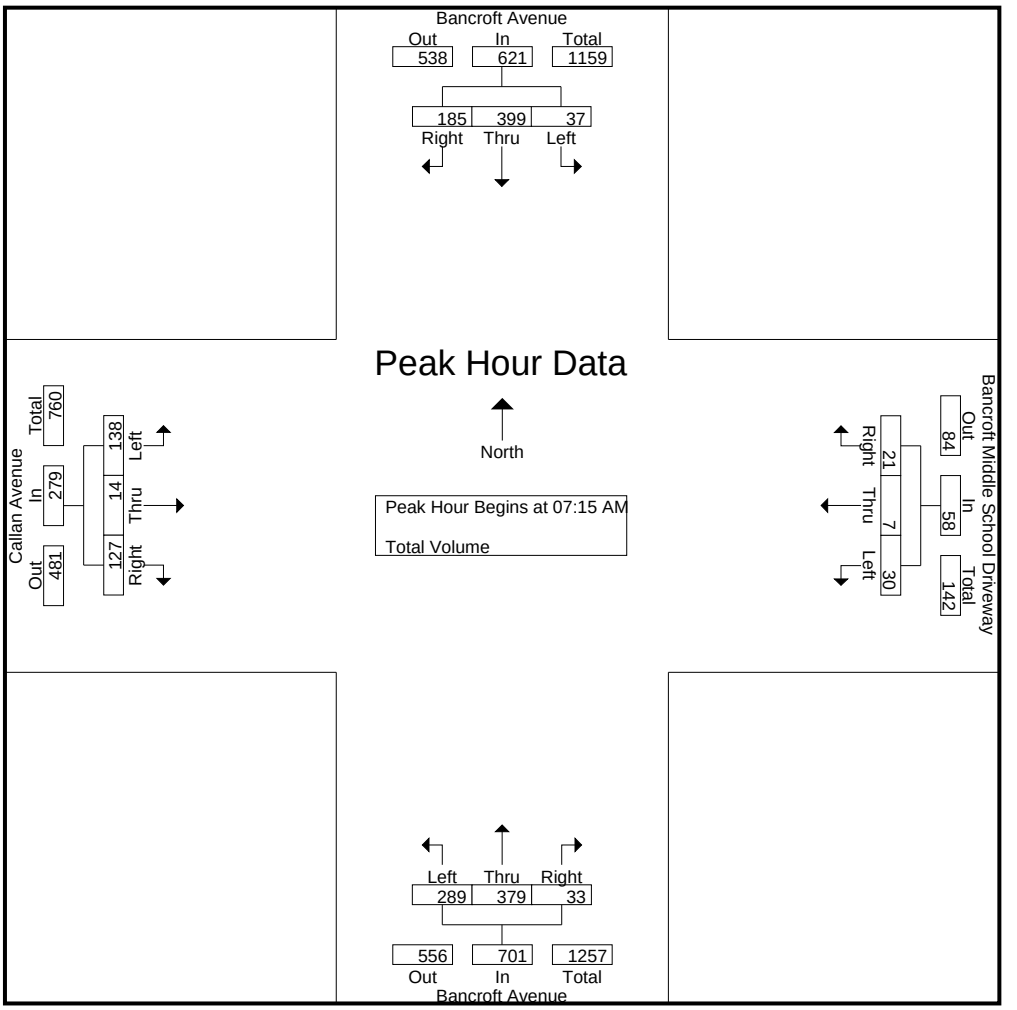

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:15 AM				07:15 AM				07:15 AM			
+0 mins.	**12**	113	54	179	4	**4**	6	14	77	70	10	157	23	4	32	59
+15 mins.	4	**129**	**65**	**198**	**15**	0	5	**20**	71	79	**17**	167	26	**6**	24	56
+30 mins.	5	79	36	120	10	1	**7**	18	62	93	4	159	38	2	29	69
+45 mins.	2	73	55	130	1	2	3	6	**79**	**137**	2	**218**	**51**	2	**42**	**95**
Total Volume	23	394	210	627	30	7	21	58	289	379	33	701	138	14	127	279
% App. Total	3.7	62.8	33.5		51.7	12.1	36.2		41.2	54.1	4.7		49.5	5	45.5	
PHF	.479	.764	.808	.792	.500	.438	.750	.725	.915	.692	.485	.804	.676	.583	.756	.734

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City of San Leandro
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File Name : 05_SLD_Bancroft_Callan PM
Site Code : 22018742
Start Date : 10/4/2018
Page No : 1

Groups Printed- Total Volume

	Bancroft Avenue Southbound				Bancroft Middle School Driveway Westbound				Bancroft Avenue Northbound				Callan Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	6	91	40	137	4	4	7	15	31	98	2	131	43	2	52	97	380
04:15 PM	8	80	34	122	5	1	9	15	35	125	10	170	56	1	46	103	410
04:30 PM	2	87	39	128	5	3	6	14	36	87	13	136	55	3	52	110	388
04:45 PM	4	91	37	132	4	1	2	7	39	104	6	149	49	2	35	86	374
Total	20	349	150	519	18	9	24	51	141	414	31	586	203	8	185	396	1552
05:00 PM	6	96	44	146	6	2	4	12	40	123	7	170	90	0	51	141	469
05:15 PM	2	102	34	138	11	2	6	19	34	117	8	159	47	2	53	102	418
05:30 PM	3	96	48	147	2	3	4	9	35	112	11	158	48	6	49	103	417
05:45 PM	13	105	39	157	7	9	12	28	34	131	8	173	59	3	60	122	480
Total	24	399	165	588	26	16	26	68	143	483	34	660	244	11	213	468	1784
Grand Total	44	748	315	1107	44	25	50	119	284	897	65	1246	447	19	398	864	3336
Apprch %	4	67.6	28.5		37	21	42		22.8	72	5.2		51.7	2.2	46.1		
Total %	1.3	22.4	9.4	33.2	1.3	0.7	1.5	3.6	8.5	26.9	1.9	37.4	13.4	0.6	11.9	25.9	

	Bancroft Avenue Southbound				Bancroft Middle School Driveway Westbound				Bancroft Avenue Northbound				Callan Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	6	96	44	146	6	2	4	12	**40**	123	7	170	**90**	0	51	**141**	469
05:15 PM	2	102	34	138	**11**	2	6	19	34	117	8	159	47	2	53	102	418
05:30 PM	3	96	**48**	147	2	3	4	9	35	112	**11**	158	48	**6**	49	103	417
05:45 PM	**13**	**105**	39	**157**	7	**9**	**12**	**28**	34	**131**	8	**173**	59	3	**60**	122	**480**
Total Volume	24	399	165	588	26	16	26	68	143	483	34	660	244	11	213	468	1784
% App. Total	4.1	67.9	28.1		38.2	23.5	38.2		21.7	73.2	5.2		52.1	2.4	45.5		
PHF	.462	.950	.859	.936	.591	.444	.542	.607	.894	.922	.773	.954	.678	.458	.888	.830	.929

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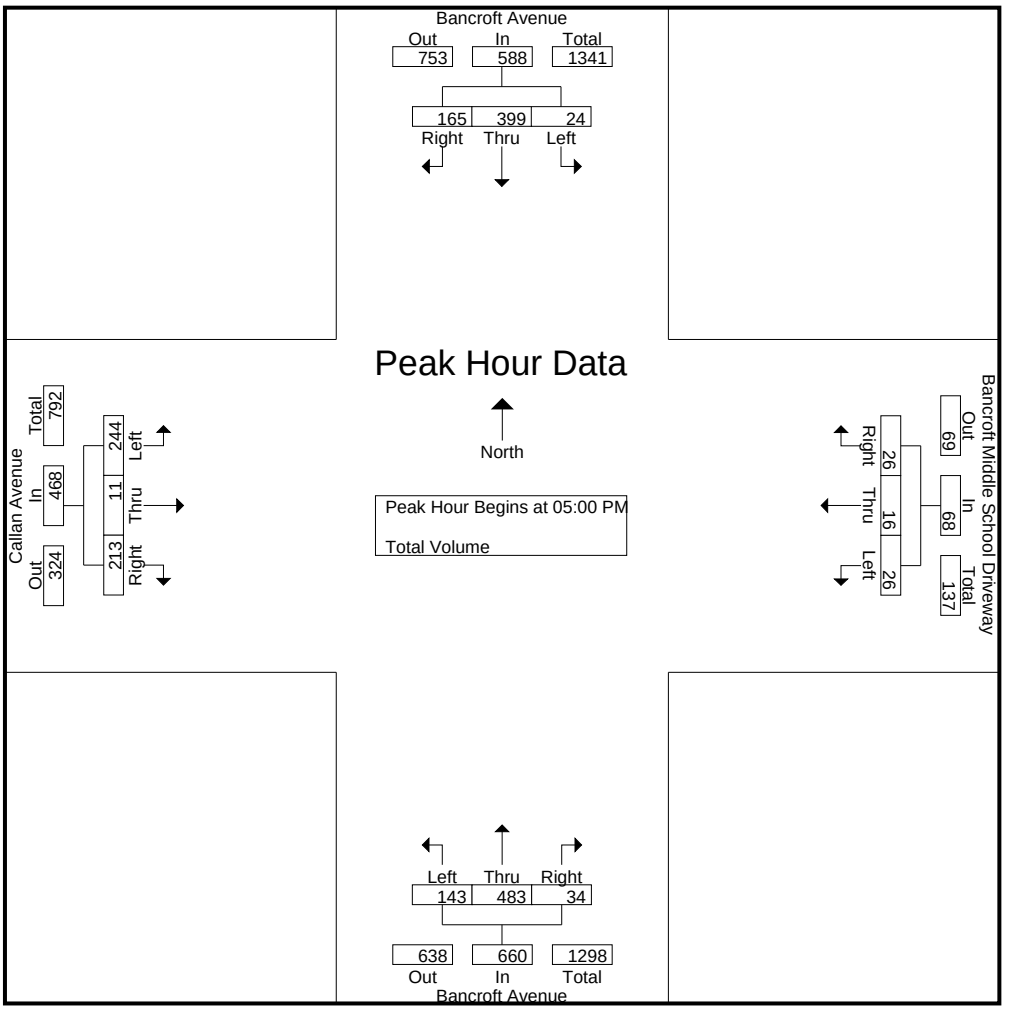
City of San Leandro
N/S: Bancroft Avenue
E/W: Callan Avenue
Weather: Clear

File Name : 05_SLD_Bancroft_Callan PM
Site Code : 22018742
Start Date : 10/4/2018
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	05:00 PM				05:00 PM				05:00 PM				05:00 PM			
+0 mins.	6	96	44	146	6	2	4	12	**40**	123	7	170	**90**	0	51	**141**
+15 mins.	2	102	34	138	**11**	2	6	19	34	117	8	159	47	2	53	102
+30 mins.	3	96	**48**	147	2	3	4	9	35	112	**11**	158	48	**6**	49	103
+45 mins.	**13**	**105**	39	**157**	7	**9**	**12**	**28**	34	**131**	8	**173**	59	3	**60**	122
Total Volume	24	399	165	588	26	16	26	68	143	483	34	660	244	11	213	468
% App. Total	4.1	67.9	28.1		38.2	23.5	38.2		21.7	73.2	5.2		52.1	2.4	45.5	
PHF	.462	.950	.859	.936	.591	.444	.542	.607	.894	.922	.773	.954	.678	.458	.888	.830

Location: San Leandro
N/S: Bancroft Avenue
E/W: Callan Avenue

Date: 10/4/2018
Day: Thursday

PEDESTRIANS

	North Leg Bancroft Avenue	East Leg Bancroft Middle School DW	South Leg Bancroft Avenue	West Leg Callan Avenue	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
7:00 AM	0	2	0	3	5
7:15 AM	8	5	0	9	22
7:30 AM	17	11	0	1	29
7:45 AM	42	14	1	13	70
8:00 AM	97	40	1	29	167
8:15 AM	24	10	0	8	42
8:30 AM	6	6	0	1	13
8:45 AM	0	2	0	2	4
TOTAL VOLUMES:	194	90	2	66	352

	North Leg Bancroft Avenue	East Leg Bancroft Middle School DW	South Leg Bancroft Avenue	West Leg Callan Avenue	
	Pedestrians	Pedestrians	Pedestrians	Pedestrians	
4:00 PM	27	13	1	13	54
4:15 PM	10	9	0	6	25
4:30 PM	7	4	0	8	19
4:45 PM	9	2	0	6	17
5:00 PM	14	5	2	8	29
5:15 PM	11	2	0	11	24
5:30 PM	3	1	0	6	10
5:45 PM	33	1	1	22	57
TOTAL VOLUMES:	114	37	4	80	235

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Location: San Leandro
N/S: Bancroft Avenue
E/W: Callan Avenue

Date: 10/4/2018
Day: Thursday

BICYCLES

	Southbound Bancroft Avenue			Westbound Bancroft Middle School DW			Northbound Bancroft Avenue			Eastbound Callan Avenue			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00 AM	0	2	0	0	0	0	0	0	0	0	0	0	2
7:15 AM	0	2	0	0	0	0	0	0	0	0	2	0	4
7:30 AM	0	2	0	0	0	0	0	3	1	0	1	1	8
7:45 AM	1	4	0	0	0	0	0	0	1	0	1	0	7
8:00 AM	1	7	0	0	0	0	0	0	0	0	3	0	11
8:15 AM	0	1	0	0	0	0	0	1	1	0	1	0	4
8:30 AM	0	0	0	0	0	0	0	2	0	0	0	0	2
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL VOLUMES:	2	18	0	0	0	0	0	6	3	0	8	1	38

	Southbound Bancroft Avenue			Westbound Bancroft Middle School DW			Northbound Bancroft Avenue			Eastbound Callan Avenue			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
4:00 PM	0	3	0	0	0	0	0	1	0	1	0	0	5
4:15 PM	0	1	0	0	1	0	0	2	0	1	0	0	5
4:30 PM	1	1	0	0	0	0	0	4	1	0	1	0	8
4:45 PM	0	0	1	0	1	0	0	5	2	0	1	0	10
5:00 PM	3	1	1	0	1	0	0	8	0	0	1	1	16
5:15 PM	0	0	1	0	2	0	0	7	0	0	0	1	11
5:30 PM	0	0	1	0	1	1	0	8	0	0	3	1	15
5:45 PM	1	0	0	0	2	0	0	1	3	0	0	0	7
TOTAL VOLUMES:	5	6	4	0	8	1	0	36	6	2	6	3	77

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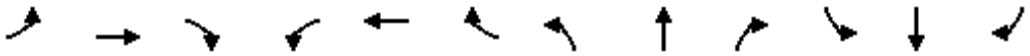
APPENDIX B – EXISTING CONDITIONS LOS AND QUEUE LENGTH CALCULATIONS

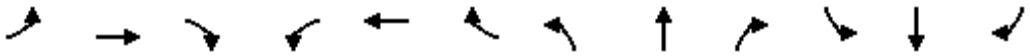
LEVEL OF SERVICE (LOS) CALCULATIONS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	214	142	36	434	47	318	403	35	38	356	28
Future Volume (vph)	45	214	142	36	434	47	318	403	35	38	356	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2		4.2	4.6		4.2	4.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	0.98	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1765	3539	1520	1737	3481		1770	3485		1770	3490	
Flt Permitted	0.27	1.00	1.00	0.59	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	493	3539	1520	1073	3481		1770	3485		1770	3490	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	47	223	148	38	452	49	331	420	36	40	371	29
RTOR Reduction (vph)	0	0	117	0	10	0	0	6	0	0	7	0
Lane Group Flow (vph)	47	223	31	38	491	0	331	450	0	40	393	0
Confl. Peds. (#/hr)	7		27	27		7	33		17	17		33
Confl. Bikes (#/hr)			3			1						4
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)	18.6	18.6	18.6	18.6	18.6		23.6	53.3		5.1	34.8	
Effective Green, g (s)	18.6	18.6	18.6	18.6	18.6		23.6	53.3		5.1	34.8	
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21		0.26	0.59		0.06	0.39	
Clearance Time (s)	4.2	4.2	4.2	4.2	4.2		4.2	4.6		4.2	4.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	101	731	314	221	719		464	2063		100	1349	
v/s Ratio Prot		0.06			c0.14		c0.19	0.13		0.02	c0.11	
v/s Ratio Perm	0.10		0.02	0.04								
v/c Ratio	0.47	0.31	0.10	0.17	0.68		0.71	0.22		0.40	0.29	
Uniform Delay, d1	31.3	30.2	28.9	29.4	33.0		30.1	8.6		41.0	19.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.19	0.85		1.04	0.89	
Incremental Delay, d2	3.4	0.2	0.1	0.4	2.7		4.9	0.2		2.5	0.5	
Delay (s)	34.7	30.5	29.0	29.7	35.7		40.8	7.5		45.0	17.5	
Level of Service	C	C	C	C	D		D	A		D	B	
Approach Delay (s)		30.4			35.3			21.5			20.0	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		

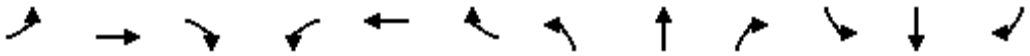
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	99	12	160	52	243	35	483	107	91	383	49
Future Volume (vph)	24	99	12	160	52	243	35	483	107	91	383	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.95		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	0.98	1.00		0.99	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.98		1.00	0.88		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1734	1827		1752	1552		1752	3417		1756	3463	
Flt Permitted	0.23	1.00		0.63	1.00		0.48	1.00		0.40	1.00	
Satd. Flow (perm)	415	1827		1162	1552		886	3417		731	3463	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	26	109	13	176	57	267	38	531	118	100	421	54
RTOR Reduction (vph)	0	6	0	0	212	0	0	16	0	0	8	0
Lane Group Flow (vph)	26	116	0	176	112	0	38	633	0	100	467	0
Confl. Peds. (#/hr)	39		11	11		39	11		9	9		11
Confl. Bikes (#/hr)			5			8			1			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	17.6	17.6		17.6	17.6		63.8	63.8		63.8	63.8	
Effective Green, g (s)	17.6	17.6		17.6	17.6		63.8	63.8		63.8	63.8	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.71	0.71		0.71	0.71	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.6	4.6		4.6	4.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	81	357		227	303		628	2422		518	2454	
v/s Ratio Prot		0.06			0.07			c0.19			0.13	
v/s Ratio Perm	0.06			c0.15			0.04			0.14		
v/c Ratio	0.32	0.33		0.78	0.37		0.06	0.26		0.19	0.19	
Uniform Delay, d1	31.1	31.1		34.3	31.4		4.0	4.7		4.4	4.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.28	0.25	
Incremental Delay, d2	0.8	0.2		13.9	0.3		0.2	0.3		0.8	0.2	
Delay (s)	31.9	31.3		48.3	31.7		4.2	4.9		2.1	1.3	
Level of Service	C	C		D	C		A	A		A	A	
Approach Delay (s)		31.4			37.5			4.9			1.4	
Approach LOS		C			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.6
Intersection Capacity Utilization	62.3%	ICU Level of Service	B
Analysis Period (min)	15		

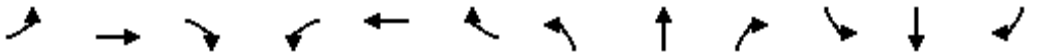
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	1	5	8	18	39	19	476	6	10	416	338
Future Volume (vph)	108	1	5	8	18	39	19	476	6	10	416	338
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2			4.2		4.6	4.6		4.6	4.6	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	0.97	
Flpb, ped/bikes		1.00			1.00		0.98	1.00		0.98	1.00	
Frt		0.99			0.92		1.00	1.00		1.00	0.93	
Flt Protected		0.95			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1767			1677		1740	3529		1734	3187	
Flt Permitted		0.72			0.96		0.33	1.00		0.46	1.00	
Satd. Flow (perm)		1335			1620		605	3529		836	3187	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	117	1	5	9	20	42	21	517	7	11	452	367
RTOR Reduction (vph)	0	3	0	0	36	0	0	1	0	0	92	0
Lane Group Flow (vph)	0	120	0	0	35	0	21	524	0	11	727	0
Confl. Peds. (#/hr)			9	9			36		28	28		36
Confl. Bikes (#/hr)			2			2			1			9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.7			13.7		67.5	67.5		67.5	67.5	
Effective Green, g (s)		13.7			13.7		67.5	67.5		67.5	67.5	
Actuated g/C Ratio		0.15			0.15		0.75	0.75		0.75	0.75	
Clearance Time (s)		4.2			4.2		4.6	4.6		4.6	4.6	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		203			246		453	2646		627	2390	
v/s Ratio Prot								0.15			c0.23	
v/s Ratio Perm		c0.09			0.02		0.03			0.01		
v/c Ratio		0.59			0.14		0.05	0.20		0.02	0.30	
Uniform Delay, d1		35.6			33.1		2.9	3.3		2.9	3.6	
Progression Factor		1.00			1.00		0.54	0.55		1.00	1.00	
Incremental Delay, d2		4.6			0.3		0.2	0.2		0.1	0.3	
Delay (s)		40.1			33.3		1.8	2.0		2.9	4.0	
Level of Service		D			C		A	A		A	A	
Approach Delay (s)		40.1			33.3			2.0			4.0	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		

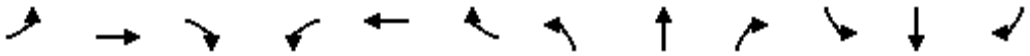
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	392	36	10	750	2	115	46	28	2	62	318
Future Volume (vph)	66	392	36	10	750	2	115	46	28	2	62	318
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0			3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.96		1.00	0.95
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.98	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		1.00	1.00
Satd. Flow (prot)	1770	3477		1770	3537			1760	1526		1859	1501
Flt Permitted	0.95	1.00		0.95	1.00			0.72	1.00		0.99	1.00
Satd. Flow (perm)	1770	3477		1770	3537			1321	1526		1851	1501
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	69	413	38	11	789	2	121	48	29	2	65	335
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	24	0	0	226
Lane Group Flow (vph)	69	447	0	11	791	0	0	169	5	0	67	109
Confl. Peds. (#/hr)	16		13	13		16	21		14	14		21
Confl. Bikes (#/hr)			2			1			2			6
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	8.4	79.7		1.5	72.8			18.8	18.8		18.8	18.8
Effective Green, g (s)	8.4	79.7		1.5	72.8			18.8	18.8		18.8	18.8
Actuated g/C Ratio	0.08	0.72		0.01	0.66			0.17	0.17		0.17	0.17
Clearance Time (s)	3.0	4.0		3.0	4.0			3.0	3.0		3.0	3.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	135	2519		24	2340			225	260		316	256
v/s Ratio Prot	c0.04	0.13		0.01	c0.22							
v/s Ratio Perm								c0.13	0.00		0.04	0.07
v/c Ratio	0.51	0.18		0.46	0.34			0.75	0.02		0.21	0.42
Uniform Delay, d1	48.8	4.8		53.8	8.1			43.4	37.9		39.2	40.8
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.2	0.2		13.2	0.4			13.2	0.0		0.3	1.1
Delay (s)	52.1	4.9		67.1	8.5			56.6	38.0		39.6	41.9
Level of Service	D	A		E	A			E	D		D	D
Approach Delay (s)		11.2			9.3			53.8			41.5	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		

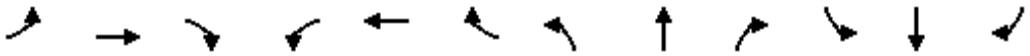
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	138	14	127	30	7	21	289	379	33	37	399	185
Future Volume (vph)	138	14	127	30	7	21	289	379	33	37	399	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.97			0.88		1.00	0.99		1.00	0.95	
Flpb, ped/bikes	0.72	1.00			1.00		1.00	1.00		0.92	1.00	
Frt	1.00	0.87			0.95		1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1282	1557			1525		1770	1830		1635	1692	
Flt Permitted	0.77	1.00			0.80		0.11	1.00		0.47	1.00	
Satd. Flow (perm)	1033	1557			1249		196	1830		815	1692	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	172	18	159	38	9	26	361	474	41	46	499	231
RTOR Reduction (vph)	0	124	0	0	20	0	0	3	0	0	21	0
Lane Group Flow (vph)	173	53	0	0	53	0	361	512	0	46	709	0
Confl. Peds. (#/hr)	164		2	2		164	52		70	70		52
Confl. Bikes (#/hr)			8						5			17
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		5	2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	17.8	17.8			17.8		53.2	53.2		33.5	33.5	
Effective Green, g (s)	17.8	17.8			17.8		53.2	53.2		33.5	33.5	
Actuated g/C Ratio	0.22	0.22			0.22		0.67	0.67		0.42	0.42	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	229	346			277		429	1216		341	708	
v/s Ratio Prot		0.03					c0.16	0.28			c0.42	
v/s Ratio Perm	c0.17				0.04		0.40			0.06		
v/c Ratio	0.76	0.15			0.19		0.84	0.42		0.13	1.00	
Uniform Delay, d1	29.1	25.0			25.3		21.6	6.2		14.3	23.2	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.2	0.2			0.3		13.9	1.1		0.2	34.2	
Delay (s)	42.3	25.2			25.6		35.5	7.3		14.5	57.4	
Level of Service	D	C			C		D	A		B	E	
Approach Delay (s)		33.7			25.6			18.9			54.9	
Approach LOS		C			C			B			D	

Intersection Summary			
HCM 2000 Control Delay	35.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	90.8%	ICU Level of Service	E
Analysis Period (min)	15		

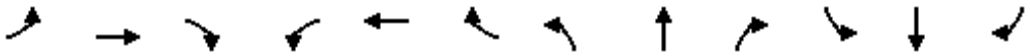
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	468	216	35	316	30	212	469	38	49	469	39
Future Volume (vph)	83	468	216	35	316	30	212	469	38	49	469	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2		4.2	4.6		4.2	4.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1765	3539	1522	1751	3488		1770	3485		1770	3490	
Flt Permitted	0.44	1.00	1.00	0.31	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	821	3539	1522	579	3488		1770	3485		1770	3490	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	86	482	223	36	326	31	219	484	39	51	484	40
RTOR Reduction (vph)	0	0	145	0	9	0	0	6	0	0	6	0
Lane Group Flow (vph)	86	482	78	36	348	0	219	517	0	51	518	0
Confl. Peds. (#/hr)	5		27	27		5	22		20	20		22
Confl. Bikes (#/hr)			4			2			11			3
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)	19.3	19.3	19.3	19.3	19.3		15.9	46.7		6.0	36.8	
Effective Green, g (s)	19.3	19.3	19.3	19.3	19.3		15.9	46.7		6.0	36.8	
Actuated g/C Ratio	0.23	0.23	0.23	0.23	0.23		0.19	0.55		0.07	0.43	
Clearance Time (s)	4.2	4.2	4.2	4.2	4.2		4.2	4.6		4.2	4.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	186	803	345	131	791		331	1914		124	1510	
v/s Ratio Prot		c0.14			0.10		c0.12	0.15		0.03	c0.15	
v/s Ratio Perm	0.10		0.05	0.06								
v/c Ratio	0.46	0.60	0.23	0.27	0.44		0.66	0.27		0.41	0.34	
Uniform Delay, d1	28.4	29.4	26.8	27.1	28.2		32.1	10.1		37.8	16.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.23	0.89		0.88	1.16	
Incremental Delay, d2	1.8	1.3	0.3	1.1	0.4		4.6	0.3		2.0	0.6	
Delay (s)	30.2	30.7	27.1	28.2	28.6		43.9	9.3		35.3	19.2	
Level of Service	C	C	C	C	C		D	A		D	B	
Approach Delay (s)		29.6			28.6			19.5			20.7	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		

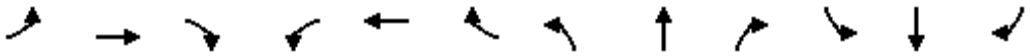
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	163	34	132	134	142	48	468	124	184	428	89
Future Volume (vph)	92	163	34	132	134	142	48	468	124	184	428	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.95		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	0.96	1.00		0.98	1.00		0.99	1.00		0.98	1.00	
Frt	1.00	0.97		1.00	0.92		1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1699	1799		1741	1638		1743	3369		1726	3415	
Flt Permitted	0.26	1.00		0.44	1.00		0.44	1.00		0.40	1.00	
Satd. Flow (perm)	474	1799		812	1638		808	3369		729	3415	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	99	175	37	142	144	153	52	503	133	198	460	96
RTOR Reduction (vph)	0	10	0	0	52	0	0	21	0	0	16	0
Lane Group Flow (vph)	99	202	0	142	245	0	52	615	0	198	540	0
Confl. Peds. (#/hr)	75		24	24		75	20		29	29		20
Confl. Bikes (#/hr)			11			7			4			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	17.3	17.3		17.3	17.3		59.1	59.1		59.1	59.1	
Effective Green, g (s)	17.3	17.3		17.3	17.3		59.1	59.1		59.1	59.1	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.70	0.70		0.70	0.70	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.6	4.6		4.6	4.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	96	366		165	333		561	2342		506	2374	
v/s Ratio Prot		0.11			0.15			0.18			0.16	
v/s Ratio Perm	c0.21			0.17			0.06			c0.27		
v/c Ratio	1.03	0.55		0.86	0.74		0.09	0.26		0.39	0.23	
Uniform Delay, d1	33.9	30.4		32.7	31.7		4.2	4.8		5.4	4.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.48	0.23	
Incremental Delay, d2	100.6	1.0		33.0	7.1		0.3	0.3		2.2	0.2	
Delay (s)	134.4	31.4		65.7	38.8		4.5	5.1		4.8	1.3	
Level of Service	F	C		E	D		A	A		A	A	
Approach Delay (s)		64.2			47.5			5.1			2.2	
Approach LOS		E			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.6
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		

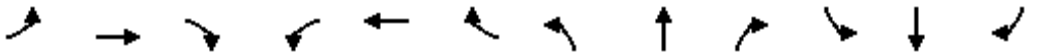
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	72	72	9	52	225	30	537	2	19	522	237
Future Volume (vph)	109	72	72	9	52	225	30	537	2	19	522	237
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2			4.2		4.1	4.1		4.1	4.1	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.96			0.89		1.00	1.00		1.00	0.95	
Flt Protected		0.98			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1753			1662		1770	3537		1770	3374	
Flt Permitted		0.53			0.99		0.30	1.00		0.41	1.00	
Satd. Flow (perm)		957			1644		557	3537		760	3374	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	120	79	79	10	57	247	33	590	2	21	574	260
RTOR Reduction (vph)	0	20	0	0	179	0	0	0	0	0	48	0
Lane Group Flow (vph)	0	258	0	0	135	0	33	592	0	21	786	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		23.4			23.4		53.3	53.3		53.3	53.3	
Effective Green, g (s)		23.4			23.4		53.3	53.3		53.3	53.3	
Actuated g/C Ratio		0.28			0.28		0.63	0.63		0.63	0.63	
Clearance Time (s)		4.2			4.2		4.1	4.1		4.1	4.1	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		263			452		349	2217		476	2115	
v/s Ratio Prot								0.17			c0.23	
v/s Ratio Perm		c0.27			0.08		0.06			0.03		
v/c Ratio		0.98			0.30		0.09	0.27		0.04	0.37	
Uniform Delay, d1		30.6			24.3		6.3	7.1		6.1	7.7	
Progression Factor		1.00			1.00		0.68	0.83		1.00	1.00	
Incremental Delay, d2		50.4			0.4		0.5	0.3		0.2	0.5	
Delay (s)		81.0			24.7		4.8	6.2		6.3	8.2	
Level of Service		F			C		A	A		A	A	
Approach Delay (s)		81.0			24.7			6.1			8.2	
Approach LOS		F			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.3
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

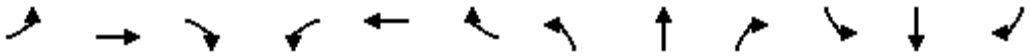
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	755	109	28	518	2	99	68	71	6	50	223
Future Volume (vph)	174	755	109	28	518	2	99	68	71	6	50	223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0			3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.94		1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.98	1.00		1.00	1.00
Frt	1.00	0.98		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	1.00
Satd. Flow (prot)	1770	3424		1770	3536			1780	1494		1849	1518
Flt Permitted	0.95	1.00		0.95	1.00			0.78	1.00		0.97	1.00
Satd. Flow (perm)	1770	3424		1770	3536			1430	1494		1809	1518
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	179	778	112	29	534	2	102	70	73	6	52	230
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	61	0	0	192
Lane Group Flow (vph)	179	883	0	29	536	0	0	172	12	0	58	38
Confl. Peds. (#/hr)	15		30	30		15	18		22	22		18
Confl. Bikes (#/hr)			2			2			7			
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	19.3	81.1		5.1	66.9			18.8	18.8		18.8	18.8
Effective Green, g (s)	19.3	81.1		5.1	66.9			18.8	18.8		18.8	18.8
Actuated g/C Ratio	0.17	0.71		0.04	0.58			0.16	0.16		0.16	0.16
Clearance Time (s)	3.0	4.0		3.0	4.0			3.0	3.0		3.0	3.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	297	2414		78	2057			233	244		295	248
v/s Ratio Prot	c0.10	c0.26		0.02	0.15							
v/s Ratio Perm								c0.12	0.01		0.03	0.02
v/c Ratio	0.60	0.37		0.37	0.26			0.74	0.05		0.20	0.15
Uniform Delay, d1	44.3	6.7		53.4	11.9			45.8	40.6		41.6	41.3
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.4	0.4		3.0	0.3			11.5	0.1		0.3	0.3
Delay (s)	47.7	7.2		56.4	12.2			57.3	40.6		41.9	41.5
Level of Service	D	A		E	B			E	D		D	D
Approach Delay (s)		14.0			14.4			52.3			41.6	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

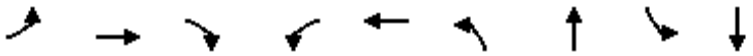


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	244	11	213	26	16	26	143	483	34	24	399	165
Future Volume (vph)	244	11	213	26	16	26	143	483	34	24	399	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.97			0.95		1.00	1.00		1.00	0.96	
Flpb, ped/bikes	0.90	1.00			1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.86			0.95		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1587	1542			1636		1770	1839		1753	1715	
Flt Permitted	0.77	1.00			0.84		0.22	1.00		0.46	1.00	
Satd. Flow (perm)	1285	1542			1402		406	1839		841	1715	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	262	12	229	28	17	28	154	519	37	26	429	177
RTOR Reduction (vph)	0	172	0	0	21	0	0	3	0	0	17	0
Lane Group Flow (vph)	262	69	0	0	52	0	154	553	0	26	589	0
Confl. Peds. (#/hr)	61		3	3		61	47		9	9		47
Confl. Bikes (#/hr)			7			7			27			8
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		5	2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	20.0	20.0			20.0		51.0	51.0		38.1	38.1	
Effective Green, g (s)	20.0	20.0			20.0		51.0	51.0		38.1	38.1	
Actuated g/C Ratio	0.25	0.25			0.25		0.64	0.64		0.48	0.48	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	321	385			350		402	1172		400	816	
v/s Ratio Prot		0.04					0.04	c0.30			c0.34	
v/s Ratio Perm	c0.20				0.04		0.20			0.03		
v/c Ratio	0.82	0.18			0.15		0.38	0.47		0.07	0.72	
Uniform Delay, d1	28.3	23.6			23.4		9.2	7.5		11.3	16.7	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.7	0.2			0.2		0.6	1.4		0.1	3.2	
Delay (s)	43.0	23.8			23.6		9.9	8.9		11.4	19.9	
Level of Service	D	C			C		A	A		B	B	
Approach Delay (s)		33.8			23.6			9.1			19.5	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		

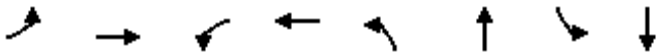
c Critical Lane Group

QUEUE LENGTH CALCULATIONS



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	47	223	148	38	501	331	456	40	400
v/c Ratio	0.47	0.30	0.34	0.17	0.69	0.71	0.21	0.27	0.30
Control Delay	45.3	30.4	7.1	29.4	36.8	44.2	8.3	43.9	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.3	30.4	7.1	29.4	36.8	44.2	8.3	43.9	18.8
Queue Length 50th (ft)	24	56	0	18	136	177	50	22	61
Queue Length 95th (ft)	56	82	45	42	175	277	91	55	122
Internal Link Dist (ft)		358			2521		320		335
Turn Bay Length (ft)	80		70	60		100		70	
Base Capacity (vph)	130	936	511	283	930	464	2147	164	1480
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.24	0.29	0.13	0.54	0.71	0.21	0.24	0.27

Intersection Summary



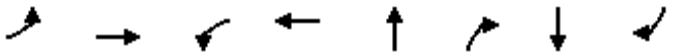
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	26	122	176	324	38	649	100	475
v/c Ratio	0.33	0.34	0.78	0.63	0.06	0.27	0.19	0.19
Control Delay	39.5	30.1	56.0	12.6	5.8	5.2	2.5	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.5	30.1	56.0	12.6	5.8	5.2	2.5	1.4
Queue Length 50th (ft)	13	57	96	29	6	52	5	10
Queue Length 95th (ft)	35	94	152	98	20	103	11	15
Internal Link Dist (ft)		480		608		320		320
Turn Bay Length (ft)	80		120		60		80	
Base Capacity (vph)	119	533	335	636	627	2440	517	2464
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.23	0.53	0.51	0.06	0.27	0.19	0.19

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	123	71	21	524	11	819
v/c Ratio	0.60	0.25	0.05	0.20	0.02	0.33
Control Delay	45.7	17.9	2.4	2.3	4.2	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.7	17.9	2.4	2.3	4.2	2.6
Queue Length 50th (ft)	64	14	1	11	1	31
Queue Length 95th (ft)	112	48	m4	26	7	66
Internal Link Dist (ft)	574	738		335		326
Turn Bay Length (ft)			50		75	
Base Capacity (vph)	432	551	453	2646	626	2480
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.13	0.05	0.20	0.02	0.33

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	69	451	11	791	169	29	67	335
v/c Ratio	0.45	0.17	0.11	0.34	0.75	0.10	0.21	0.69
Control Delay	56.1	5.2	51.1	9.9	62.9	7.7	38.7	16.8
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0
Total Delay	56.1	5.2	51.1	10.3	62.9	7.7	38.7	16.8
Queue Length 50th (ft)	47	36	8	120	115	0	41	38
Queue Length 95th (ft)	90	94	26	206	177	18	76	126
Internal Link Dist (ft)		962		358	240		574	
Turn Bay Length (ft)	180		70			90		90
Base Capacity (vph)	167	2598	144	2361	372	459	521	620
Starvation Cap Reductn	0	0	0	964	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.17	0.08	0.57	0.45	0.06	0.13	0.54

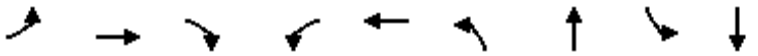
Intersection Summary

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	173	177	73	361	515	46	730
v/c Ratio	0.76	0.38	0.25	0.84	0.42	0.13	1.00
Control Delay	49.2	7.8	18.5	40.4	8.3	15.7	58.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.2	7.8	18.5	40.4	8.3	15.7	58.1
Queue Length 50th (ft)	80	7	19	123	105	14	~341
Queue Length 95th (ft)	121	38	42	#263	160	31	#474
Internal Link Dist (ft)		2521	32		336		271
Turn Bay Length (ft)	240			95		50	
Base Capacity (vph)	289	553	369	430	1220	341	729
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.32	0.20	0.84	0.42	0.13	1.00

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

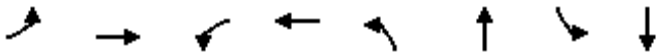
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	86	482	223	36	357	219	523	51	524
v/c Ratio	0.46	0.60	0.46	0.27	0.45	0.66	0.26	0.24	0.34
Control Delay	35.2	31.9	9.2	30.5	28.2	48.1	10.3	33.1	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	31.9	9.2	30.5	28.2	48.1	10.3	33.1	21.5
Queue Length 50th (ft)	40	121	15	16	83	113	53	26	73
Queue Length 95th (ft)	77	152	65	39	110	m181	121	m60	178
Internal Link Dist (ft)		358			2521		320		335
Turn Bay Length (ft)	80		70	60		100		70	
Base Capacity (vph)	213	919	533	150	913	453	2083	216	1560
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.52	0.42	0.24	0.39	0.48	0.25	0.24	0.34

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	99	212	142	297	52	636	198	556
v/c Ratio	1.03	0.56	0.87	0.77	0.09	0.27	0.39	0.23
Control Delay	136.8	33.3	73.3	37.7	6.3	5.3	5.7	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	136.8	33.3	73.3	37.7	6.3	5.3	5.7	1.4
Queue Length 50th (ft)	~59	97	74	119	8	48	9	8
Queue Length 95th (ft)	#129	145	#131	183	26	98	82	8
Internal Link Dist (ft)		480		608		320		320
Turn Bay Length (ft)	80		120		60		80	
Base Capacity (vph)	144	559	248	547	563	2364	507	2390
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.38	0.57	0.54	0.09	0.27	0.39	0.23

Intersection Summary

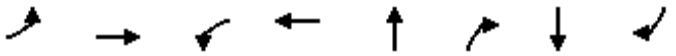
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	278	314	33	592	21	834
v/c Ratio	0.99	0.50	0.09	0.27	0.04	0.39
Control Delay	77.0	8.2	6.8	7.2	9.1	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.0	8.2	6.8	7.2	9.1	8.1
Queue Length 50th (ft)	135	27	8	87	4	85
Queue Length 95th (ft)	#235	78	m30	154	17	162
Internal Link Dist (ft)	574	738		335		326
Turn Bay Length (ft)			50		75	
Base Capacity (vph)	376	774	350	2226	478	2172
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.41	0.09	0.27	0.04	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	179	890	29	536	172	73	58	230
v/c Ratio	0.60	0.36	0.25	0.26	0.74	0.24	0.20	0.52
Control Delay	53.1	8.0	55.9	13.4	63.5	10.5	40.8	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.1	8.0	55.9	13.4	63.5	10.5	40.8	9.5
Queue Length 50th (ft)	124	128	21	97	122	0	38	0
Queue Length 95th (ft)	193	215	51	160	187	38	71	64
Internal Link Dist (ft)		962		358	240		574	
Turn Bay Length (ft)	180		70			90		90
Base Capacity (vph)	296	2456	129	2091	385	457	487	577
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.36	0.22	0.26	0.45	0.16	0.12	0.40

Intersection Summary

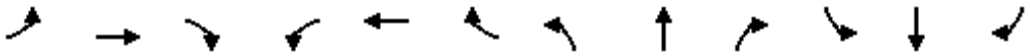
Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	262	241	73	154	556	26	606
v/c Ratio	0.82	0.43	0.20	0.38	0.47	0.06	0.73
Control Delay	49.1	6.7	16.6	9.3	9.7	14.1	24.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.1	6.7	16.6	9.3	9.7	14.1	24.0
Queue Length 50th (ft)	117	4	17	30	140	7	236
Queue Length 95th (ft)	#229	56	48	54	214	23	#437
Internal Link Dist (ft)		2521	32		336		271
Turn Bay Length (ft)	240			95		50	
Base Capacity (vph)	362	599	415	438	1176	401	834
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.40	0.18	0.35	0.47	0.06	0.73

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX C – BASELINE CONDITIONS LOS AND QUEUE LENGTH CALCULATIONS

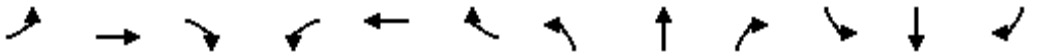
LEVEL OF SERVICE (LOS) CALCULATIONS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	214	142	36	434	47	318	403	35	38	356	29
Future Volume (vph)	48	214	142	36	434	47	318	403	35	38	356	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2		4.2	4.6		4.2	4.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	0.98	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1765	3539	1520	1737	3481		1770	3485		1770	3488	
Flt Permitted	0.27	1.00	1.00	0.59	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	493	3539	1520	1073	3481		1770	3485		1770	3488	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	50	223	148	38	452	49	331	420	36	40	371	30
RTOR Reduction (vph)	0	0	117	0	10	0	0	6	0	0	7	0
Lane Group Flow (vph)	50	223	31	38	491	0	331	450	0	40	394	0
Confl. Peds. (#/hr)	7		27	27		7	33		17	17		33
Confl. Bikes (#/hr)			3			1						4
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)	18.6	18.6	18.6	18.6	18.6		23.6	53.3		5.1	34.8	
Effective Green, g (s)	18.6	18.6	18.6	18.6	18.6		23.6	53.3		5.1	34.8	
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21		0.26	0.59		0.06	0.39	
Clearance Time (s)	4.2	4.2	4.2	4.2	4.2		4.2	4.6		4.2	4.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	101	731	314	221	719		464	2063		100	1348	
v/s Ratio Prot		0.06			c0.14		c0.19	0.13		0.02	c0.11	
v/s Ratio Perm	0.10		0.02	0.04								
v/c Ratio	0.50	0.31	0.10	0.17	0.68		0.71	0.22		0.40	0.29	
Uniform Delay, d1	31.5	30.2	28.9	29.4	33.0		30.1	8.6		41.0	19.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.18	0.85		1.04	0.89	
Incremental Delay, d2	3.8	0.2	0.1	0.4	2.7		4.9	0.2		2.5	0.5	
Delay (s)	35.3	30.5	29.0	29.7	35.7		40.6	7.5		45.0	17.5	
Level of Service	D	C	C	C	D		D	A		D	B	
Approach Delay (s)		30.5			35.3			21.4			20.0	
Approach LOS		C			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		

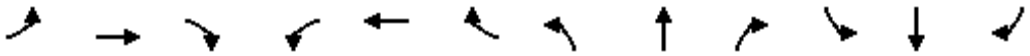
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	99	12	160	52	243	35	483	107	91	383	49
Future Volume (vph)	27	99	12	160	52	243	35	483	107	91	383	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.95		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	0.98	1.00		0.99	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.98		1.00	0.88		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1734	1827		1752	1552		1752	3417		1756	3463	
Flt Permitted	0.23	1.00		0.63	1.00		0.48	1.00		0.40	1.00	
Satd. Flow (perm)	415	1827		1162	1552		886	3417		731	3463	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	30	109	13	176	57	267	38	531	118	100	421	54
RTOR Reduction (vph)	0	6	0	0	212	0	0	16	0	0	8	0
Lane Group Flow (vph)	30	116	0	176	112	0	38	633	0	100	467	0
Confl. Peds. (#/hr)	39		11	11		39	11		9	9		11
Confl. Bikes (#/hr)			5			8			1			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	17.6	17.6		17.6	17.6		63.8	63.8		63.8	63.8	
Effective Green, g (s)	17.6	17.6		17.6	17.6		63.8	63.8		63.8	63.8	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.71	0.71		0.71	0.71	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.6	4.6		4.6	4.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	81	357		227	303		628	2422		518	2454	
v/s Ratio Prot		0.06			0.07			c0.19			0.13	
v/s Ratio Perm	0.07			c0.15			0.04			0.14		
v/c Ratio	0.37	0.33		0.78	0.37		0.06	0.26		0.19	0.19	
Uniform Delay, d1	31.4	31.1		34.3	31.4		4.0	4.7		4.4	4.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.28	0.25	
Incremental Delay, d2	1.0	0.2		13.9	0.3		0.2	0.3		0.8	0.2	
Delay (s)	32.4	31.3		48.3	31.7		4.2	4.9		2.0	1.3	
Level of Service	C	C		D	C		A	A		A	A	
Approach Delay (s)		31.5			37.5			4.9			1.4	
Approach LOS		C			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.6
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

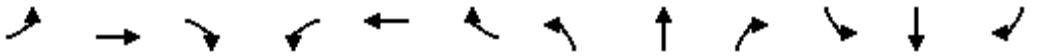
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	1	5	8	18	39	19	476	6	10	417	338
Future Volume (vph)	108	1	5	8	18	39	19	476	6	10	417	338
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2			4.2		4.6	4.6		4.6	4.6	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	0.97	
Flpb, ped/bikes		1.00			1.00		0.98	1.00		0.98	1.00	
Frt		0.99			0.92		1.00	1.00		1.00	0.93	
Flt Protected		0.95			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1767			1677		1740	3529		1734	3188	
Flt Permitted		0.72			0.96		0.33	1.00		0.46	1.00	
Satd. Flow (perm)		1335			1620		604	3529		836	3188	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	117	1	5	9	20	42	21	517	7	11	453	367
RTOR Reduction (vph)	0	3	0	0	36	0	0	1	0	0	92	0
Lane Group Flow (vph)	0	120	0	0	35	0	21	524	0	11	728	0
Confl. Peds. (#/hr)			9	9			36		28	28		36
Confl. Bikes (#/hr)			2			2			1			9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.7			13.7		67.5	67.5		67.5	67.5	
Effective Green, g (s)		13.7			13.7		67.5	67.5		67.5	67.5	
Actuated g/C Ratio		0.15			0.15		0.75	0.75		0.75	0.75	
Clearance Time (s)		4.2			4.2		4.6	4.6		4.6	4.6	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		203			246		453	2646		627	2391	
v/s Ratio Prot								0.15			c0.23	
v/s Ratio Perm		c0.09			0.02		0.03			0.01		
v/c Ratio		0.59			0.14		0.05	0.20		0.02	0.30	
Uniform Delay, d1		35.6			33.1		2.9	3.3		2.9	3.6	
Progression Factor		1.00			1.00		0.56	0.57		1.00	1.00	
Incremental Delay, d2		4.6			0.3		0.2	0.2		0.1	0.3	
Delay (s)		40.1			33.3		1.8	2.0		2.9	4.0	
Level of Service		D			C		A	A		A	A	
Approach Delay (s)		40.1			33.3			2.0			4.0	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		

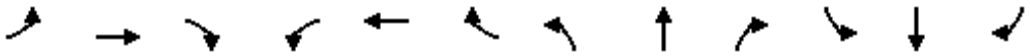
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	395	36	10	751	2	115	46	28	2	62	318
Future Volume (vph)	66	395	36	10	751	2	115	46	28	2	62	318
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0			3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.96		1.00	0.95
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.98	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		1.00	1.00
Satd. Flow (prot)	1770	3478		1770	3537			1760	1526		1859	1501
Flt Permitted	0.95	1.00		0.95	1.00			0.72	1.00		0.99	1.00
Satd. Flow (perm)	1770	3478		1770	3537			1321	1526		1851	1501
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	69	416	38	11	791	2	121	48	29	2	65	335
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	24	0	0	226
Lane Group Flow (vph)	69	450	0	11	793	0	0	169	5	0	67	109
Confl. Peds. (#/hr)	16		13	13		16	21		14	14		21
Confl. Bikes (#/hr)			2			1			2			6
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	8.4	79.7		1.5	72.8			18.8	18.8		18.8	18.8
Effective Green, g (s)	8.4	79.7		1.5	72.8			18.8	18.8		18.8	18.8
Actuated g/C Ratio	0.08	0.72		0.01	0.66			0.17	0.17		0.17	0.17
Clearance Time (s)	3.0	4.0		3.0	4.0			3.0	3.0		3.0	3.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	135	2519		24	2340			225	260		316	256
v/s Ratio Prot	c0.04	0.13		0.01	c0.22							
v/s Ratio Perm								c0.13	0.00		0.04	0.07
v/c Ratio	0.51	0.18		0.46	0.34			0.75	0.02		0.21	0.42
Uniform Delay, d1	48.8	4.8		53.8	8.1			43.4	37.9		39.2	40.8
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.2	0.2		13.2	0.4			13.2	0.0		0.3	1.1
Delay (s)	52.1	4.9		67.1	8.5			56.6	38.0		39.6	41.9
Level of Service	D	A		E	A			E	D		D	D
Approach Delay (s)		11.2			9.3			53.8			41.5	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	21.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		

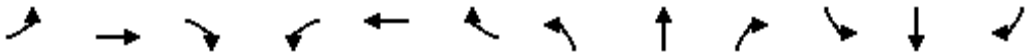
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	138	14	127	30	7	21	289	379	33	37	399	185
Future Volume (vph)	138	14	127	30	7	21	289	379	33	37	399	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.97			0.88		1.00	0.99		1.00	0.95	
Flpb, ped/bikes	0.72	1.00			1.00		1.00	1.00		0.92	1.00	
Frt	1.00	0.87			0.95		1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1282	1557			1525		1770	1830		1635	1692	
Flt Permitted	0.77	1.00			0.80		0.11	1.00		0.47	1.00	
Satd. Flow (perm)	1033	1557			1249		196	1830		815	1692	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	172	18	159	38	9	26	361	474	41	46	499	231
RTOR Reduction (vph)	0	124	0	0	20	0	0	3	0	0	21	0
Lane Group Flow (vph)	173	53	0	0	53	0	361	512	0	46	709	0
Confl. Peds. (#/hr)	164		2	2		164	52		70	70		52
Confl. Bikes (#/hr)			8						5			17
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		5	2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	17.8	17.8			17.8		53.2	53.2		33.5	33.5	
Effective Green, g (s)	17.8	17.8			17.8		53.2	53.2		33.5	33.5	
Actuated g/C Ratio	0.22	0.22			0.22		0.67	0.67		0.42	0.42	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	229	346			277		429	1216		341	708	
v/s Ratio Prot		0.03					c0.16	0.28			c0.42	
v/s Ratio Perm	c0.17				0.04		0.40			0.06		
v/c Ratio	0.76	0.15			0.19		0.84	0.42		0.13	1.00	
Uniform Delay, d1	29.1	25.0			25.3		21.6	6.2		14.3	23.2	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	13.2	0.2			0.3		13.9	1.1		0.2	34.2	
Delay (s)	42.3	25.2			25.6		35.5	7.3		14.5	57.4	
Level of Service	D	C			C		D	A		B	E	
Approach Delay (s)		33.7			25.6			18.9			54.9	
Approach LOS		C			C			B			D	

Intersection Summary			
HCM 2000 Control Delay	35.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	90.8%	ICU Level of Service	E
Analysis Period (min)	15		

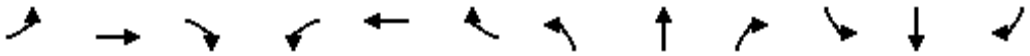
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	468	216	35	316	30	212	469	38	49	469	42
Future Volume (vph)	84	468	216	35	316	30	212	469	38	49	469	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2		4.2	4.6		4.2	4.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1765	3539	1522	1751	3488		1770	3485		1770	3487	
Flt Permitted	0.44	1.00	1.00	0.31	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	821	3539	1522	579	3488		1770	3485		1770	3487	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	87	482	223	36	326	31	219	484	39	51	484	43
RTOR Reduction (vph)	0	0	145	0	9	0	0	6	0	0	7	0
Lane Group Flow (vph)	87	482	78	36	348	0	219	517	0	51	520	0
Confl. Peds. (#/hr)	5		27	27		5	22		20	20		22
Confl. Bikes (#/hr)			4			2			11			3
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)	19.3	19.3	19.3	19.3	19.3		15.9	46.7		6.0	36.8	
Effective Green, g (s)	19.3	19.3	19.3	19.3	19.3		15.9	46.7		6.0	36.8	
Actuated g/C Ratio	0.23	0.23	0.23	0.23	0.23		0.19	0.55		0.07	0.43	
Clearance Time (s)	4.2	4.2	4.2	4.2	4.2		4.2	4.6		4.2	4.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	186	803	345	131	791		331	1914		124	1509	
v/s Ratio Prot		c0.14			0.10		c0.12	0.15		0.03	c0.15	
v/s Ratio Perm	0.11		0.05	0.06								
v/c Ratio	0.47	0.60	0.23	0.27	0.44		0.66	0.27		0.41	0.34	
Uniform Delay, d1	28.4	29.4	26.8	27.1	28.2		32.1	10.1		37.8	16.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.22	0.89		0.88	1.16	
Incremental Delay, d2	1.9	1.3	0.3	1.1	0.4		4.6	0.3		2.0	0.6	
Delay (s)	30.3	30.7	27.1	28.2	28.6		43.9	9.3		35.3	19.3	
Level of Service	C	C	C	C	C		D	A		D	B	
Approach Delay (s)		29.6			28.6			19.5			20.7	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	24.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		

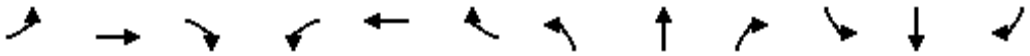
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	163	34	132	134	142	48	468	124	184	428	89
Future Volume (vph)	92	163	34	132	134	142	48	468	124	184	428	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.95		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	0.96	1.00		0.98	1.00		0.99	1.00		0.98	1.00	
Frt	1.00	0.97		1.00	0.92		1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1699	1799		1741	1638		1743	3369		1726	3415	
Flt Permitted	0.26	1.00		0.44	1.00		0.44	1.00		0.40	1.00	
Satd. Flow (perm)	474	1799		812	1638		808	3369		729	3415	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	99	175	37	142	144	153	52	503	133	198	460	96
RTOR Reduction (vph)	0	10	0	0	52	0	0	21	0	0	16	0
Lane Group Flow (vph)	99	202	0	142	245	0	52	615	0	198	540	0
Confl. Peds. (#/hr)	75		24	24		75	20		29	29		20
Confl. Bikes (#/hr)			11			7			4			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	17.3	17.3		17.3	17.3		59.1	59.1		59.1	59.1	
Effective Green, g (s)	17.3	17.3		17.3	17.3		59.1	59.1		59.1	59.1	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.70	0.70		0.70	0.70	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.6	4.6		4.6	4.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	96	366		165	333		561	2342		506	2374	
v/s Ratio Prot		0.11			0.15			0.18			0.16	
v/s Ratio Perm	c0.21			0.17			0.06			c0.27		
v/c Ratio	1.03	0.55		0.86	0.74		0.09	0.26		0.39	0.23	
Uniform Delay, d1	33.9	30.4		32.7	31.7		4.2	4.8		5.4	4.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.48	0.23	
Incremental Delay, d2	100.6	1.0		33.0	7.1		0.3	0.3		2.2	0.2	
Delay (s)	134.4	31.4		65.7	38.8		4.5	5.1		4.7	1.3	
Level of Service	F	C		E	D		A	A		A	A	
Approach Delay (s)		64.2			47.5			5.1			2.2	
Approach LOS		E			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.6
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		

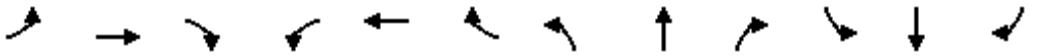
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	72	72	9	52	225	30	538	2	19	525	237
Future Volume (vph)	109	72	72	9	52	225	30	538	2	19	525	237
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2			4.2		4.1	4.1		4.1	4.1	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.96			0.89		1.00	1.00		1.00	0.95	
Flt Protected		0.98			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1753			1662		1770	3537		1770	3374	
Flt Permitted		0.53			0.99		0.30	1.00		0.41	1.00	
Satd. Flow (perm)		957			1644		555	3537		759	3374	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	120	79	79	10	57	247	33	591	2	21	577	260
RTOR Reduction (vph)	0	20	0	0	179	0	0	0	0	0	48	0
Lane Group Flow (vph)	0	258	0	0	135	0	33	593	0	21	789	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		23.4			23.4		53.3	53.3		53.3	53.3	
Effective Green, g (s)		23.4			23.4		53.3	53.3		53.3	53.3	
Actuated g/C Ratio		0.28			0.28		0.63	0.63		0.63	0.63	
Clearance Time (s)		4.2			4.2		4.1	4.1		4.1	4.1	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		263			452		348	2217		475	2115	
v/s Ratio Prot								0.17			c0.23	
v/s Ratio Perm		c0.27			0.08		0.06			0.03		
v/c Ratio		0.98			0.30		0.09	0.27		0.04	0.37	
Uniform Delay, d1		30.6			24.3		6.3	7.1		6.1	7.7	
Progression Factor		1.00			1.00		0.68	0.83		1.00	1.00	
Incremental Delay, d2		50.4			0.4		0.5	0.3		0.2	0.5	
Delay (s)		81.0			24.7		4.8	6.2		6.3	8.2	
Level of Service		F			C		A	A		A	A	
Approach Delay (s)		81.0			24.7			6.1			8.2	
Approach LOS		F			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.3
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

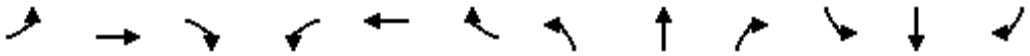
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	756	109	28	521	2	99	68	71	6	50	223
Future Volume (vph)	174	756	109	28	521	2	99	68	71	6	50	223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0			3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.94		1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.98	1.00		1.00	1.00
Frt	1.00	0.98		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	1.00
Satd. Flow (prot)	1770	3424		1770	3536			1780	1494		1849	1518
Flt Permitted	0.95	1.00		0.95	1.00			0.78	1.00		0.97	1.00
Satd. Flow (perm)	1770	3424		1770	3536			1430	1494		1809	1518
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	179	779	112	29	537	2	102	70	73	6	52	230
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	61	0	0	192
Lane Group Flow (vph)	179	884	0	29	539	0	0	172	12	0	58	38
Confl. Peds. (#/hr)	15		30	30		15	18		22	22		18
Confl. Bikes (#/hr)			2			2			7			
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	19.3	81.1		5.1	66.9			18.8	18.8		18.8	18.8
Effective Green, g (s)	19.3	81.1		5.1	66.9			18.8	18.8		18.8	18.8
Actuated g/C Ratio	0.17	0.71		0.04	0.58			0.16	0.16		0.16	0.16
Clearance Time (s)	3.0	4.0		3.0	4.0			3.0	3.0		3.0	3.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	297	2414		78	2057			233	244		295	248
v/s Ratio Prot	c0.10	c0.26		0.02	0.15							
v/s Ratio Perm								c0.12	0.01		0.03	0.02
v/c Ratio	0.60	0.37		0.37	0.26			0.74	0.05		0.20	0.15
Uniform Delay, d1	44.3	6.7		53.4	11.9			45.8	40.6		41.6	41.3
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.4	0.4		3.0	0.3			11.5	0.1		0.3	0.3
Delay (s)	47.7	7.2		56.4	12.2			57.3	40.6		41.9	41.5
Level of Service	D	A		E	B			E	D		D	D
Approach Delay (s)		14.0			14.4			52.3			41.6	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

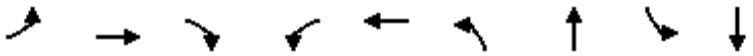


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	244	11	213	26	16	26	143	483	34	24	399	165
Future Volume (vph)	244	11	213	26	16	26	143	483	34	24	399	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.97			0.95		1.00	1.00		1.00	0.96	
Flpb, ped/bikes	0.90	1.00			1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.86			0.95		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1587	1542			1636		1770	1839		1753	1715	
Flt Permitted	0.77	1.00			0.84		0.22	1.00		0.46	1.00	
Satd. Flow (perm)	1285	1542			1402		406	1839		841	1715	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	262	12	229	28	17	28	154	519	37	26	429	177
RTOR Reduction (vph)	0	172	0	0	21	0	0	3	0	0	17	0
Lane Group Flow (vph)	262	69	0	0	52	0	154	553	0	26	589	0
Confl. Peds. (#/hr)	61		3	3		61	47		9	9		47
Confl. Bikes (#/hr)			7			7			27			8
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		5	2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	20.0	20.0			20.0		51.0	51.0		38.1	38.1	
Effective Green, g (s)	20.0	20.0			20.0		51.0	51.0		38.1	38.1	
Actuated g/C Ratio	0.25	0.25			0.25		0.64	0.64		0.48	0.48	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	321	385			350		402	1172		400	816	
v/s Ratio Prot		0.04					0.04	c0.30			c0.34	
v/s Ratio Perm	c0.20				0.04		0.20			0.03		
v/c Ratio	0.82	0.18			0.15		0.38	0.47		0.07	0.72	
Uniform Delay, d1	28.3	23.6			23.4		9.2	7.5		11.3	16.7	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.7	0.2			0.2		0.6	1.4		0.1	3.2	
Delay (s)	43.0	23.8			23.6		9.9	8.9		11.4	19.9	
Level of Service	D	C			C		A	A		B	B	
Approach Delay (s)		33.8			23.6			9.1			19.5	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	79.9%	ICU Level of Service	D
Analysis Period (min)	15		

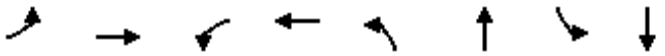
c Critical Lane Group

QUEUE LENGTH CALCULATIONS



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	50	223	148	38	501	331	456	40	401
v/c Ratio	0.50	0.30	0.34	0.17	0.69	0.71	0.21	0.27	0.30
Control Delay	47.2	30.4	7.1	29.4	36.8	44.1	8.3	43.9	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.2	30.4	7.1	29.4	36.8	44.1	8.3	43.9	18.8
Queue Length 50th (ft)	25	56	0	18	136	176	49	22	61
Queue Length 95th (ft)	61	82	45	42	175	274	90	55	123
Internal Link Dist (ft)		358			2521		320		335
Turn Bay Length (ft)	80		70	60		100		70	
Base Capacity (vph)	130	936	511	283	930	464	2147	164	1480
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.24	0.29	0.13	0.54	0.71	0.21	0.24	0.27

Intersection Summary



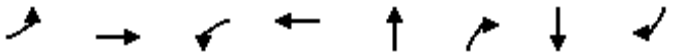
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	30	122	176	324	38	649	100	475
v/c Ratio	0.38	0.34	0.78	0.63	0.06	0.27	0.19	0.19
Control Delay	42.4	30.1	56.0	12.6	5.8	5.2	2.5	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.4	30.1	56.0	12.6	5.8	5.2	2.5	1.4
Queue Length 50th (ft)	15	57	96	29	6	52	5	10
Queue Length 95th (ft)	39	94	152	98	20	103	11	15
Internal Link Dist (ft)		480		608		320		320
Turn Bay Length (ft)	80		120		60		80	
Base Capacity (vph)	119	533	335	636	627	2440	517	2464
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.23	0.53	0.51	0.06	0.27	0.19	0.19

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	123	71	21	524	11	820
v/c Ratio	0.60	0.25	0.05	0.20	0.02	0.33
Control Delay	45.7	17.9	2.5	2.3	4.2	2.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.7	17.9	2.5	2.3	4.2	2.6
Queue Length 50th (ft)	64	14	1	12	1	32
Queue Length 95th (ft)	112	48	m5	27	7	66
Internal Link Dist (ft)	574	738		335		326
Turn Bay Length (ft)			50		75	
Base Capacity (vph)	432	551	453	2646	626	2480
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.13	0.05	0.20	0.02	0.33

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	69	454	11	793	169	29	67	335
v/c Ratio	0.45	0.17	0.11	0.34	0.75	0.10	0.21	0.69
Control Delay	56.1	5.2	51.1	9.9	62.9	7.7	38.7	16.8
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0
Total Delay	56.1	5.2	51.1	10.3	62.9	7.7	38.7	16.8
Queue Length 50th (ft)	47	36	8	121	115	0	41	38
Queue Length 95th (ft)	90	95	26	207	177	18	76	126
Internal Link Dist (ft)		962		358	240		574	
Turn Bay Length (ft)	180		70			90		90
Base Capacity (vph)	167	2598	144	2361	372	459	521	620
Starvation Cap Reductn	0	0	0	963	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.17	0.08	0.57	0.45	0.06	0.13	0.54

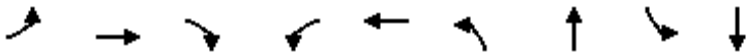
Intersection Summary

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	173	177	73	361	515	46	730
v/c Ratio	0.76	0.38	0.25	0.84	0.42	0.13	1.00
Control Delay	49.2	7.8	18.5	40.4	8.3	15.7	58.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.2	7.8	18.5	40.4	8.3	15.7	58.1
Queue Length 50th (ft)	80	7	19	123	105	14	~341
Queue Length 95th (ft)	121	38	42	#263	160	31	#474
Internal Link Dist (ft)		2521	32		336		271
Turn Bay Length (ft)	240			95		50	
Base Capacity (vph)	289	553	369	430	1220	341	729
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.32	0.20	0.84	0.42	0.13	1.00

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

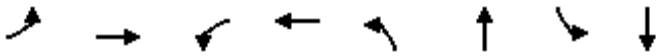
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	87	482	223	36	357	219	523	51	527
v/c Ratio	0.47	0.60	0.46	0.27	0.45	0.66	0.26	0.24	0.35
Control Delay	35.4	31.9	9.2	30.5	28.2	48.0	10.3	33.1	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.4	31.9	9.2	30.5	28.2	48.0	10.3	33.1	21.5
Queue Length 50th (ft)	40	121	15	16	83	113	53	26	73
Queue Length 95th (ft)	77	152	65	39	110	m181	121	m60	180
Internal Link Dist (ft)		358			2521		320		335
Turn Bay Length (ft)	80		70	60		100		70	
Base Capacity (vph)	213	919	533	150	913	453	2083	216	1558
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.52	0.42	0.24	0.39	0.48	0.25	0.24	0.34

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	99	212	142	297	52	636	198	556
v/c Ratio	1.03	0.56	0.87	0.77	0.09	0.27	0.39	0.23
Control Delay	136.8	33.3	73.3	37.7	6.3	5.3	5.7	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	136.8	33.3	73.3	37.7	6.3	5.3	5.7	1.4
Queue Length 50th (ft)	~59	97	74	119	8	48	9	8
Queue Length 95th (ft)	#129	145	#131	183	26	98	80	9
Internal Link Dist (ft)		480		608		320		320
Turn Bay Length (ft)	80		120		60		80	
Base Capacity (vph)	144	559	248	547	563	2364	507	2390
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.38	0.57	0.54	0.09	0.27	0.39	0.23

Intersection Summary

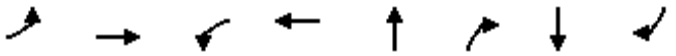
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	278	314	33	593	21	837
v/c Ratio	0.99	0.50	0.10	0.27	0.04	0.39
Control Delay	77.0	8.2	6.8	7.2	9.1	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.0	8.2	6.8	7.2	9.1	8.1
Queue Length 50th (ft)	135	27	8	87	4	85
Queue Length 95th (ft)	#235	78	m30	155	17	163
Internal Link Dist (ft)	574	738		335		326
Turn Bay Length (ft)			50		75	
Base Capacity (vph)	376	774	349	2226	478	2171
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.41	0.09	0.27	0.04	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	179	891	29	539	172	73	58	230
v/c Ratio	0.60	0.36	0.25	0.26	0.74	0.24	0.20	0.52
Control Delay	53.1	8.0	55.9	13.4	63.5	10.5	40.8	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.1	8.0	55.9	13.4	63.5	10.5	40.8	9.5
Queue Length 50th (ft)	124	128	21	97	122	0	38	0
Queue Length 95th (ft)	193	215	51	161	187	38	71	64
Internal Link Dist (ft)		962		358	240		574	
Turn Bay Length (ft)	180		70			90		90
Base Capacity (vph)	296	2456	129	2091	385	457	487	577
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.36	0.22	0.26	0.45	0.16	0.12	0.40

Intersection Summary

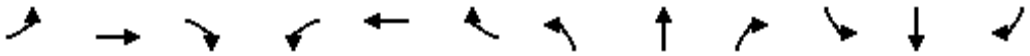
Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	262	241	73	154	556	26	606
v/c Ratio	0.82	0.43	0.20	0.38	0.47	0.06	0.73
Control Delay	49.1	6.7	16.6	9.3	9.7	14.1	24.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.1	6.7	16.6	9.3	9.7	14.1	24.0
Queue Length 50th (ft)	117	4	17	30	140	7	236
Queue Length 95th (ft)	#229	56	48	54	214	23	#437
Internal Link Dist (ft)		2521	32		336		271
Turn Bay Length (ft)	240			95		50	
Base Capacity (vph)	362	599	415	438	1176	401	834
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.40	0.18	0.35	0.47	0.06	0.73

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX D – BASELINE PLUS PROJECT LOS AND QUEUE LENGTH CALCULATIONS

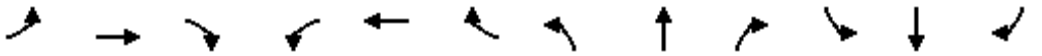
LEVEL OF SERVICE (LOS) CALCULATIONS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	250	142	62	479	47	318	408	54	38	361	41
Future Volume (vph)	57	250	142	62	479	47	318	408	54	38	361	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2		4.2	4.6		4.2	4.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	0.98	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1765	3539	1521	1739	3486		1770	3459		1770	3469	
Flt Permitted	0.25	1.00	1.00	0.55	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	458	3539	1521	1000	3486		1770	3459		1770	3469	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	59	260	148	65	499	49	331	425	56	40	376	43
RTOR Reduction (vph)	0	0	115	0	9	0	0	9	0	0	9	0
Lane Group Flow (vph)	59	260	33	65	539	0	331	472	0	40	410	0
Confl. Peds. (#/hr)	7		27	27		7	33		17	17		33
Confl. Bikes (#/hr)			3			1						4
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)	20.3	20.3	20.3	20.3	20.3		23.6	51.6		5.1	33.1	
Effective Green, g (s)	20.3	20.3	20.3	20.3	20.3		23.6	51.6		5.1	33.1	
Actuated g/C Ratio	0.23	0.23	0.23	0.23	0.23		0.26	0.57		0.06	0.37	
Clearance Time (s)	4.2	4.2	4.2	4.2	4.2		4.2	4.6		4.2	4.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	103	798	343	225	786		464	1983		100	1275	
v/s Ratio Prot		0.07			c0.15		c0.19	0.14		0.02	c0.12	
v/s Ratio Perm	0.13		0.02	0.06								
v/c Ratio	0.57	0.33	0.10	0.29	0.69		0.71	0.24		0.40	0.32	
Uniform Delay, d1	31.0	29.1	27.6	28.9	31.9		30.1	9.5		41.0	20.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.22	0.84		1.07	0.90	
Incremental Delay, d2	7.5	0.2	0.1	0.7	2.5		5.0	0.3		2.5	0.6	
Delay (s)	38.5	29.4	27.7	29.6	34.4		41.6	8.2		46.3	19.0	
Level of Service	D	C	C	C	C		D	A		D	B	
Approach Delay (s)		30.0			33.9			21.8			21.4	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		

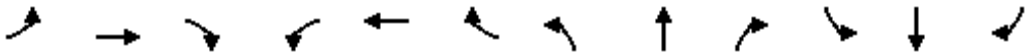
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	27	99	12	160	52	254	35	496	107	105	400	49
Future Volume (vph)	27	99	12	160	52	254	35	496	107	105	400	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.95		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	0.98	1.00		0.99	1.00		0.99	1.00		0.99	1.00	
Frt	1.00	0.98		1.00	0.88		1.00	0.97		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1736	1827		1752	1549		1753	3420		1756	3465	
Flt Permitted	0.23	1.00		0.63	1.00		0.47	1.00		0.39	1.00	
Satd. Flow (perm)	415	1827		1162	1549		870	3420		719	3465	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	30	109	13	176	57	279	38	545	118	115	440	54
RTOR Reduction (vph)	0	6	0	0	212	0	0	12	0	0	6	0
Lane Group Flow (vph)	30	116	0	176	124	0	38	651	0	115	488	0
Confl. Peds. (#/hr)	39		11	11		39	11		9	9		11
Confl. Bikes (#/hr)			5			8			1			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	17.6	17.6		17.6	17.6		63.8	63.8		63.8	63.8	
Effective Green, g (s)	17.6	17.6		17.6	17.6		63.8	63.8		63.8	63.8	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.71	0.71		0.71	0.71	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.6	4.6		4.6	4.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	81	357		227	302		616	2424		509	2456	
v/s Ratio Prot		0.06			0.08			c0.19			0.14	
v/s Ratio Perm	0.07			c0.15			0.04			0.16		
v/c Ratio	0.37	0.32		0.78	0.41		0.06	0.27		0.23	0.20	
Uniform Delay, d1	31.4	31.1		34.3	31.7		4.0	4.7		4.5	4.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.31	0.29	
Incremental Delay, d2	1.0	0.2		13.9	0.3		0.2	0.3		1.0	0.2	
Delay (s)	32.4	31.3		48.3	32.0		4.2	5.0		2.4	1.4	
Level of Service	C	C		D	C		A	A		A	A	
Approach Delay (s)		31.5			37.6			4.9			1.6	
Approach LOS		C			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.6
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

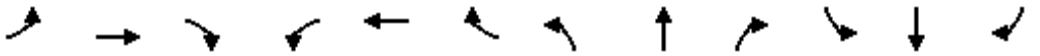
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	1	5	29	18	61	19	474	25	27	413	338
Future Volume (vph)	108	1	5	29	18	61	19	474	25	27	413	338
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2			4.2		4.6	4.6		4.6	4.6	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	0.97	
Flpb, ped/bikes		1.00			1.00		0.98	1.00		0.98	1.00	
Frt		0.99			0.92		1.00	0.99		1.00	0.93	
Flt Protected		0.95			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1767			1673		1740	3502		1735	3186	
Flt Permitted		0.59			0.92		0.33	1.00		0.45	1.00	
Satd. Flow (perm)		1094			1556		607	3502		821	3186	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	117	1	5	32	20	66	21	515	27	29	449	367
RTOR Reduction (vph)	0	3	0	0	56	0	0	2	0	0	85	0
Lane Group Flow (vph)	0	120	0	0	62	0	21	540	0	29	731	0
Confl. Peds. (#/hr)			9	9			36		28	28		36
Confl. Bikes (#/hr)			2			2			1			9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		13.7			13.7		67.5	67.5		67.5	67.5	
Effective Green, g (s)		13.7			13.7		67.5	67.5		67.5	67.5	
Actuated g/C Ratio		0.15			0.15		0.75	0.75		0.75	0.75	
Clearance Time (s)		4.2			4.2		4.6	4.6		4.6	4.6	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		166			236		455	2626		615	2389	
v/s Ratio Prot								0.15			c0.23	
v/s Ratio Perm		c0.11			0.04		0.03			0.04		
v/c Ratio		0.73			0.26		0.05	0.21		0.05	0.31	
Uniform Delay, d1		36.4			33.7		2.9	3.3		2.9	3.7	
Progression Factor		1.00			1.00		0.68	0.65		1.00	1.00	
Incremental Delay, d2		14.6			0.6		0.2	0.2		0.1	0.3	
Delay (s)		50.9			34.3		2.2	2.3		3.1	4.0	
Level of Service		D			C		A	A		A	A	
Approach Delay (s)		50.9			34.3			2.3			4.0	
Approach LOS		D			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		

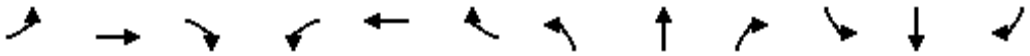
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	66	440	36	10	808	2	115	46	28	2	62	318
Future Volume (vph)	66	440	36	10	808	2	115	46	28	2	62	318
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0			3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.96		1.00	0.95
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.98	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		1.00	1.00
Satd. Flow (prot)	1770	3484		1770	3537			1760	1526		1859	1502
Flt Permitted	0.95	1.00		0.95	1.00			0.72	1.00		0.99	1.00
Satd. Flow (perm)	1770	3484		1770	3537			1321	1526		1852	1502
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	69	463	38	11	851	2	121	48	29	2	65	335
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	24	0	0	207
Lane Group Flow (vph)	69	498	0	11	853	0	0	169	5	0	67	128
Confl. Peds. (#/hr)	16		13	13		16	21		14	14		21
Confl. Bikes (#/hr)			2			1			2			6
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	8.4	79.6		1.5	72.7			18.9	18.9		18.9	18.9
Effective Green, g (s)	8.4	79.6		1.5	72.7			18.9	18.9		18.9	18.9
Actuated g/C Ratio	0.08	0.72		0.01	0.66			0.17	0.17		0.17	0.17
Clearance Time (s)	3.0	4.0		3.0	4.0			3.0	3.0		3.0	3.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	135	2521		24	2337			226	262		318	258
v/s Ratio Prot	c0.04	0.14		0.01	c0.24							
v/s Ratio Perm								c0.13	0.00		0.04	0.09
v/c Ratio	0.51	0.20		0.46	0.36			0.75	0.02		0.21	0.50
Uniform Delay, d1	48.8	4.9		53.8	8.3			43.3	37.8		39.1	41.2
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	3.2	0.2		13.2	0.4			12.7	0.0		0.3	1.5
Delay (s)	52.1	5.1		67.1	8.8			55.9	37.9		39.5	42.7
Level of Service	D	A		E	A			E	D		D	D
Approach Delay (s)		10.8			9.5			53.3			42.2	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	66.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	14	134	30	7	21	296	379	33	37	399	191
Future Volume (vph)	145	14	134	30	7	21	296	379	33	37	399	191
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.97			0.88		1.00	0.99		1.00	0.95	
Flpb, ped/bikes	0.72	1.00			1.00		1.00	1.00		0.92	1.00	
Frt	1.00	0.86			0.95		1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1282	1556			1525		1770	1830		1635	1688	
Flt Permitted	0.77	1.00			0.79		0.10	1.00		0.47	1.00	
Satd. Flow (perm)	1033	1556			1243		194	1830		815	1688	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	181	18	168	38	9	26	370	474	41	46	499	239
RTOR Reduction (vph)	0	131	0	0	20	0	0	3	0	0	21	0
Lane Group Flow (vph)	181	55	0	0	53	0	370	512	0	46	717	0
Confl. Peds. (#/hr)	164		2	2		164	52		70	70		52
Confl. Bikes (#/hr)			8						5			17
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		5	2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	17.8	17.8			17.8		53.2	53.2		34.0	34.0	
Effective Green, g (s)	17.8	17.8			17.8		53.2	53.2		34.0	34.0	
Actuated g/C Ratio	0.22	0.22			0.22		0.67	0.67		0.42	0.42	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	229	346			276		418	1216		346	717	
v/s Ratio Prot		0.04					c0.16	0.28			c0.42	
v/s Ratio Perm	c0.18				0.04		0.43			0.06		
v/c Ratio	0.79	0.16			0.19		0.89	0.42		0.13	1.00	
Uniform Delay, d1	29.3	25.1			25.3		22.5	6.2		14.0	23.0	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.8	0.2			0.3		19.5	1.1		0.2	33.2	
Delay (s)	46.1	25.3			25.6		41.9	7.3		14.2	56.2	
Level of Service	D	C			C		D	A		B	E	
Approach Delay (s)		35.6			25.6			21.8			53.8	
Approach LOS		D			C			C			D	

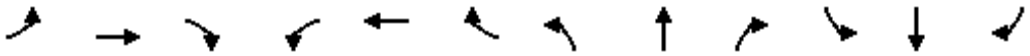
Intersection Summary			
HCM 2000 Control Delay	36.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	92.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	502	216	48	342	30	212	474	57	49	473	48
Future Volume (vph)	93	502	216	48	342	30	212	474	57	49	473	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2		4.2	4.6		4.2	4.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00		1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1765	3539	1522	1752	3491		1770	3461		1770	3481	
Flt Permitted	0.42	1.00	1.00	0.30	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	786	3539	1522	546	3491		1770	3461		1770	3481	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	96	518	223	49	353	31	219	489	59	51	488	49
RTOR Reduction (vph)	0	0	152	0	9	0	0	8	0	0	8	0
Lane Group Flow (vph)	96	518	71	49	375	0	219	540	0	51	529	0
Confl. Peds. (#/hr)	5		27	27		5	22		20	20		22
Confl. Bikes (#/hr)			4			2			11			3
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)	20.5	20.5	20.5	20.5	20.5		16.2	44.9		6.6	35.3	
Effective Green, g (s)	20.5	20.5	20.5	20.5	20.5		16.2	44.9		6.6	35.3	
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.24		0.19	0.53		0.08	0.42	
Clearance Time (s)	4.2	4.2	4.2	4.2	4.2		4.2	4.6		4.2	4.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	189	853	367	131	841		337	1828		137	1445	
v/s Ratio Prot		c0.15			0.11		c0.12	0.16		0.03	c0.15	
v/s Ratio Perm	0.12		0.05	0.09								
v/c Ratio	0.51	0.61	0.19	0.37	0.45		0.65	0.30		0.37	0.37	
Uniform Delay, d1	27.9	28.7	25.7	26.9	27.4		31.8	11.2		37.2	17.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.21	0.94		0.97	1.08	
Incremental Delay, d2	2.1	1.2	0.3	1.8	0.4		4.0	0.4		1.6	0.7	
Delay (s)	30.0	29.9	25.9	28.7	27.8		42.6	10.9		37.8	19.2	
Level of Service	C	C	C	C	C		D	B		D	B	
Approach Delay (s)		28.9			27.9			19.9			20.8	
Approach LOS		C			C			B			C	

Intersection Summary			
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

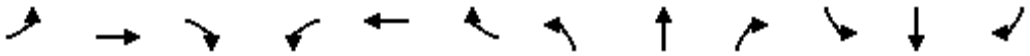
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	92	163	34	132	134	153	48	481	124	192	437	89
Future Volume (vph)	92	163	34	132	134	153	48	481	124	192	437	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.95		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	0.96	1.00		0.98	1.00		0.99	1.00		0.98	1.00	
Frt	1.00	0.97		1.00	0.92		1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1701	1799		1741	1631		1744	3373		1727	3417	
Flt Permitted	0.25	1.00		0.45	1.00		0.44	1.00		0.39	1.00	
Satd. Flow (perm)	444	1799		820	1631		798	3373		717	3417	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	99	175	37	142	144	165	52	517	133	206	470	96
RTOR Reduction (vph)	0	10	0	0	56	0	0	20	0	0	15	0
Lane Group Flow (vph)	99	202	0	142	253	0	52	630	0	206	551	0
Confl. Peds. (#/hr)	75		24	24		75	20		29	29		20
Confl. Bikes (#/hr)			11			7			4			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	17.6	17.6		17.6	17.6		58.8	58.8		58.8	58.8	
Effective Green, g (s)	17.6	17.6		17.6	17.6		58.8	58.8		58.8	58.8	
Actuated g/C Ratio	0.21	0.21		0.21	0.21		0.69	0.69		0.69	0.69	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.6	4.6		4.6	4.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	91	372		169	337		552	2333		495	2363	
v/s Ratio Prot		0.11			0.15			0.19			0.16	
v/s Ratio Perm	c0.22			0.17			0.07			c0.29		
v/c Ratio	1.09	0.54		0.84	0.75		0.09	0.27		0.42	0.23	
Uniform Delay, d1	33.7	30.1		32.4	31.6		4.3	5.0		5.7	4.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.62	0.37	
Incremental Delay, d2	120.2	0.9		28.5	7.8		0.3	0.3		2.5	0.2	
Delay (s)	153.9	31.0		60.9	39.4		4.7	5.3		6.0	2.0	
Level of Service	F	C		E	D		A	A		A	A	
Approach Delay (s)		70.1			46.2			5.2			3.1	
Approach LOS		E			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	21.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.6
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	72	72	47	52	264	30	508	46	60	497	237
Future Volume (vph)	109	72	72	47	52	264	30	508	46	60	497	237
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2			4.2		4.1	4.1		4.1	4.1	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.96			0.90		1.00	0.99		1.00	0.95	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1753			1669		1770	3495		1770	3368	
Flt Permitted		0.49			0.92		0.31	1.00		0.40	1.00	
Satd. Flow (perm)		882			1546		577	3495		743	3368	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	120	79	79	52	57	290	33	558	51	66	546	260
RTOR Reduction (vph)	0	22	0	0	146	0	0	6	0	0	47	0
Lane Group Flow (vph)	0	256	0	0	253	0	33	603	0	66	759	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		23.7			23.7		53.0	53.0		53.0	53.0	
Effective Green, g (s)		23.7			23.7		53.0	53.0		53.0	53.0	
Actuated g/C Ratio		0.28			0.28		0.62	0.62		0.62	0.62	
Clearance Time (s)		4.2			4.2		4.1	4.1		4.1	4.1	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		245			431		359	2179		463	2100	
v/s Ratio Prot								0.17			c0.23	
v/s Ratio Perm		c0.29			0.16		0.06			0.09		
v/c Ratio		1.05			0.59		0.09	0.28		0.14	0.36	
Uniform Delay, d1		30.6			26.4		6.4	7.3		6.6	7.8	
Progression Factor		1.00			1.00		0.54	0.73		1.00	1.00	
Incremental Delay, d2		70.2			2.0		0.5	0.3		0.6	0.5	
Delay (s)		100.8			28.5		3.9	5.6		7.3	8.3	
Level of Service		F			C		A	A		A	A	
Approach Delay (s)		100.8			28.5			5.5			8.2	
Approach LOS		F			C			A			A	

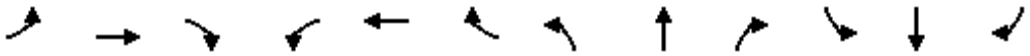
Intersection Summary			
HCM 2000 Control Delay	22.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.3
Intersection Capacity Utilization	87.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	799	109	28	553	2	99	68	71	6	50	223
Future Volume (vph)	174	799	109	28	553	2	99	68	71	6	50	223
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0			3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.94		1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.98	1.00		1.00	1.00
Frt	1.00	0.98		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	1.00
Satd. Flow (prot)	1770	3430		1770	3537			1780	1494		1849	1518
Flt Permitted	0.95	1.00		0.95	1.00			0.78	1.00		0.97	1.00
Satd. Flow (perm)	1770	3430		1770	3537			1432	1494		1809	1518
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	179	824	112	29	570	2	102	70	73	6	52	230
RTOR Reduction (vph)	0	6	0	0	0	0	0	0	61	0	0	192
Lane Group Flow (vph)	179	930	0	29	572	0	0	172	12	0	58	38
Confl. Peds. (#/hr)	15		30	30		15	18		22	22		18
Confl. Bikes (#/hr)			2			2			7			
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	16.9	81.0		5.1	69.2			18.9	18.9		18.9	18.9
Effective Green, g (s)	16.9	81.0		5.1	69.2			18.9	18.9		18.9	18.9
Actuated g/C Ratio	0.15	0.70		0.04	0.60			0.16	0.16		0.16	0.16
Clearance Time (s)	3.0	4.0		3.0	4.0			3.0	3.0		3.0	3.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	260	2415		78	2128			235	245		297	249
v/s Ratio Prot	c0.10	c0.27		0.02	0.16							
v/s Ratio Perm								c0.12	0.01		0.03	0.02
v/c Ratio	0.69	0.39		0.37	0.27			0.73	0.05		0.20	0.15
Uniform Delay, d1	46.6	6.9		53.4	10.9			45.6	40.5		41.5	41.2
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	7.4	0.5		3.0	0.3			11.1	0.1		0.3	0.3
Delay (s)	53.9	7.4		56.4	11.2			56.8	40.6		41.8	41.5
Level of Service	D	A		E	B			E	D		D	D
Approach Delay (s)		14.8			13.4			52.0			41.5	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

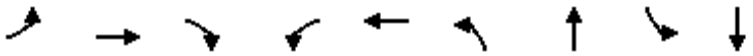


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	248	11	217	26	16	26	148	483	34	24	399	170
Future Volume (vph)	248	11	217	26	16	26	148	483	34	24	399	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.97			0.95		1.00	1.00		1.00	0.96	
Flpb, ped/bikes	0.90	1.00			1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.86			0.95		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1587	1542			1636		1770	1839		1753	1711	
Flt Permitted	0.77	1.00			0.84		0.21	1.00		0.46	1.00	
Satd. Flow (perm)	1285	1542			1400		396	1839		841	1711	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	267	12	233	28	17	28	159	519	37	26	429	183
RTOR Reduction (vph)	0	174	0	0	21	0	0	3	0	0	17	0
Lane Group Flow (vph)	267	71	0	0	52	0	159	553	0	26	595	0
Confl. Peds. (#/hr)	61		3	3		61	47		9	9		47
Confl. Bikes (#/hr)			7			7			27			8
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		5	2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	20.1	20.1			20.1		50.9	50.9		38.0	38.0	
Effective Green, g (s)	20.1	20.1			20.1		50.9	50.9		38.0	38.0	
Actuated g/C Ratio	0.25	0.25			0.25		0.64	0.64		0.48	0.48	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	322	387			351		396	1170		399	812	
v/s Ratio Prot		0.05					0.04	c0.30			c0.35	
v/s Ratio Perm	c0.21				0.04		0.21			0.03		
v/c Ratio	0.83	0.18			0.15		0.40	0.47		0.07	0.73	
Uniform Delay, d1	28.3	23.5			23.3		9.5	7.6		11.4	16.9	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	16.0	0.2			0.2		0.7	1.4		0.1	3.4	
Delay (s)	44.3	23.7			23.5		10.1	8.9		11.4	20.3	
Level of Service	D	C			C		B	A		B	C	
Approach Delay (s)		34.5			23.5			9.2			20.0	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	80.5%	ICU Level of Service	D
Analysis Period (min)	15		

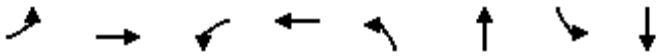
c Critical Lane Group

QUEUE LENGTH CALCULATIONS



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	59	260	148	65	548	331	481	40	419
v/c Ratio	0.57	0.33	0.32	0.29	0.69	0.71	0.23	0.27	0.33
Control Delay	52.1	29.4	6.5	30.8	35.6	45.1	8.9	45.1	20.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.1	29.4	6.5	30.8	35.6	45.1	8.9	45.1	20.2
Queue Length 50th (ft)	30	65	0	31	148	179	59	22	82
Queue Length 95th (ft)	69	91	43	62	185	275	99	54	148
Internal Link Dist (ft)		358			2521		320		335
Turn Bay Length (ft)	80		70	60		100		70	
Base Capacity (vph)	147	1140	590	321	1131	464	2063	150	1351
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.23	0.25	0.20	0.48	0.71	0.23	0.27	0.31

Intersection Summary



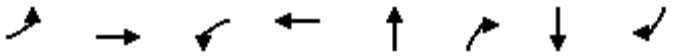
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	30	122	176	336	38	663	115	494
v/c Ratio	0.38	0.34	0.78	0.65	0.06	0.27	0.23	0.20
Control Delay	42.3	29.8	55.9	13.9	5.9	5.4	2.9	1.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.3	29.8	55.9	13.9	5.9	5.4	2.9	1.6
Queue Length 50th (ft)	15	56	96	36	6	55	6	11
Queue Length 95th (ft)	39	93	151	107	20	108	13	18
Internal Link Dist (ft)		480		608		320		320
Turn Bay Length (ft)	80		120		60		80	
Base Capacity (vph)	161	715	451	765	616	2436	510	2464
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.17	0.39	0.44	0.06	0.27	0.23	0.20

Intersection Summary

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	123	118	21	542	29	816
v/c Ratio	0.73	0.40	0.05	0.21	0.05	0.33
Control Delay	58.8	19.9	3.0	2.6	4.2	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.8	19.9	3.0	2.6	4.2	2.8
Queue Length 50th (ft)	66	26	1	18	3	33
Queue Length 95th (ft)	116	70	m6	34	13	70
Internal Link Dist (ft)	574	738		335		326
Turn Bay Length (ft)			50		75	
Base Capacity (vph)	424	642	455	2631	617	2474
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.18	0.05	0.21	0.05	0.33

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	69	501	11	853	169	29	67	335
v/c Ratio	0.45	0.19	0.11	0.36	0.75	0.09	0.21	0.72
Control Delay	56.1	5.4	51.1	10.2	62.4	0.6	38.5	20.4
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0
Total Delay	56.1	5.4	51.1	10.7	62.4	0.6	38.5	20.4
Queue Length 50th (ft)	47	41	8	133	115	0	41	53
Queue Length 95th (ft)	90	107	26	227	176	2	75	144
Internal Link Dist (ft)		962		358	240		574	
Turn Bay Length (ft)	180		70			90		90
Base Capacity (vph)	210	2601	104	2358	456	573	639	684
Starvation Cap Reductn	0	0	0	937	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.19	0.11	0.60	0.37	0.05	0.10	0.49

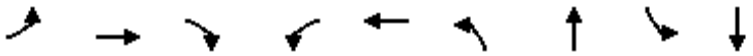
Intersection Summary

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	181	186	73	370	515	46	738
v/c Ratio	0.79	0.39	0.25	0.89	0.42	0.13	1.00
Control Delay	53.6	7.9	19.0	45.3	8.1	16.1	57.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.6	7.9	19.0	45.3	8.1	16.1	57.8
Queue Length 50th (ft)	83	7	18	131	110	14	~391
Queue Length 95th (ft)	130	40	44	#250	151	32	#491
Internal Link Dist (ft)		2521	32		336		271
Turn Bay Length (ft)	240			95		50	
Base Capacity (vph)	271	535	347	417	1220	347	739
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.35	0.21	0.89	0.42	0.13	1.00

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

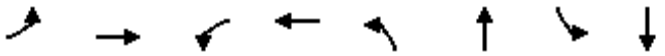
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	96	518	223	49	384	219	548	51	537
v/c Ratio	0.51	0.61	0.43	0.37	0.45	0.65	0.29	0.22	0.37
Control Delay	36.1	31.1	7.5	33.4	27.4	46.8	12.2	34.8	21.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.1	31.1	7.5	33.4	27.4	46.8	12.2	34.8	21.2
Queue Length 50th (ft)	45	130	10	22	89	109	60	26	76
Queue Length 95th (ft)	84	159	57	50	115	m187	147	m59	180
Internal Link Dist (ft)		358			2521		320		335
Turn Bay Length (ft)	80		70	60		100		70	
Base Capacity (vph)	268	1207	651	186	1199	344	1904	229	1504
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.43	0.34	0.26	0.32	0.64	0.29	0.22	0.36

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	99	212	142	309	52	650	206	566
v/c Ratio	1.09	0.55	0.84	0.78	0.09	0.28	0.42	0.24
Control Delay	154.0	32.7	68.4	37.9	6.4	5.5	7.3	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	154.0	32.7	68.4	37.9	6.4	5.5	7.3	2.1
Queue Length 50th (ft)	~60	96	74	122	8	51	10	10
Queue Length 95th (ft)	#133	144	128	188	27	103	129	76
Internal Link Dist (ft)		480		608		320		320
Turn Bay Length (ft)	80		120		60		80	
Base Capacity (vph)	140	580	260	567	552	2352	496	2380
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.37	0.55	0.54	0.09	0.28	0.42	0.24

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

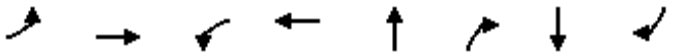
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	278	399	33	609	66	806
v/c Ratio	1.04	0.69	0.09	0.28	0.14	0.38
Control Delay	93.0	18.4	5.6	6.4	10.2	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	93.0	18.4	5.6	6.4	10.2	8.3
Queue Length 50th (ft)	~150	90	7	86	13	81
Queue Length 95th (ft)	#243	156	21	168	43	161
Internal Link Dist (ft)	574	738		335		326
Turn Bay Length (ft)			50		75	
Base Capacity (vph)	408	800	359	2183	463	2147
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.50	0.09	0.28	0.14	0.38

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	179	936	29	572	172	73	58	230
v/c Ratio	0.69	0.38	0.25	0.27	0.74	0.24	0.20	0.52
Control Delay	59.8	8.3	55.9	12.8	63.1	10.4	40.8	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.8	8.3	55.9	12.8	63.1	10.4	40.8	9.4
Queue Length 50th (ft)	127	138	21	99	122	0	38	0
Queue Length 95th (ft)	192	231	51	173	186	38	71	64
Internal Link Dist (ft)		962		358	240		574	
Turn Bay Length (ft)	180		70			90		90
Base Capacity (vph)	415	2459	129	2129	447	520	565	633
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.38	0.22	0.27	0.38	0.14	0.10	0.36

Intersection Summary

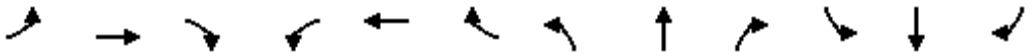
Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	267	245	73	159	556	26	612
v/c Ratio	0.83	0.44	0.20	0.40	0.47	0.07	0.74
Control Delay	50.4	6.6	16.6	9.6	9.7	14.1	24.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.4	6.6	16.6	9.6	9.7	14.1	24.5
Queue Length 50th (ft)	121	4	17	31	139	7	240
Queue Length 95th (ft)	#234	56	48	56	214	23	#445
Internal Link Dist (ft)		2521	32		336		271
Turn Bay Length (ft)	240			95		50	
Base Capacity (vph)	361	601	414	432	1174	400	830
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.41	0.18	0.37	0.47	0.07	0.74

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX E – CUMULATIVE CONDITIONS LOS CALCULATIONS

LEVEL OF SERVICE (LOS) CALCULATIONS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	250	200	62	537	58	871	680	75	42	479	41
Future Volume (vph)	57	250	200	62	537	58	871	680	75	42	479	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2		4.2	4.6		4.2	4.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	0.98	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1766	3539	1521	1739	3481		1770	3471		1770	3485	
Flt Permitted	0.22	1.00	1.00	0.56	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	406	3539	1521	1017	3481		1770	3471		1770	3485	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	59	260	208	65	559	60	907	708	78	44	499	43
RTOR Reduction (vph)	0	0	156	0	10	0	0	8	0	0	9	0
Lane Group Flow (vph)	59	260	52	65	609	0	907	778	0	44	533	0
Confl. Peds. (#/hr)	7		27	27		7	33		17	17		33
Confl. Bikes (#/hr)			3			1						4
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)	22.5	22.5	22.5	22.5	22.5		34.8	49.2		5.3	19.7	
Effective Green, g (s)	22.5	22.5	22.5	22.5	22.5		34.8	49.2		5.3	19.7	
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25		0.39	0.55		0.06	0.22	
Clearance Time (s)	4.2	4.2	4.2	4.2	4.2		4.2	4.6		4.2	4.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	101	884	380	254	870		684	1897		104	762	
v/s Ratio Prot		0.07			c0.18		c0.51	0.22		0.02	c0.15	
v/s Ratio Perm	0.15		0.03	0.06								
v/c Ratio	0.58	0.29	0.14	0.26	0.70		1.33	0.41		0.42	0.70	
Uniform Delay, d1	29.6	27.3	26.2	27.0	30.7		27.6	11.9		40.9	32.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.97	1.24		1.03	0.87	
Incremental Delay, d2	8.3	0.2	0.2	0.5	2.6		154.1	0.5		2.6	5.0	
Delay (s)	38.0	27.5	26.4	27.6	33.2		180.8	15.3		44.7	33.3	
Level of Service	D	C	C	C	C		F	B		D	C	
Approach Delay (s)		28.2			32.7			104.0			34.1	
Approach LOS		C			C			F			C	

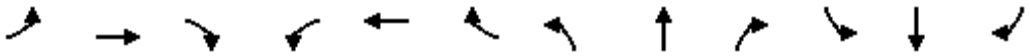
Intersection Summary			
HCM 2000 Control Delay	66.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	109.2%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	99	111	20	171	58	280	37	1216	114	124	522	67
Future Volume (vph)	99	111	20	171	58	280	37	1216	114	124	522	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	0.95		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.98	1.00		0.99	1.00		0.99	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.88		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1738	1812		1753	1553		1757	3482		1767	3462	
Flt Permitted	0.22	1.00		0.61	1.00		0.39	1.00		0.12	1.00	
Satd. Flow (perm)	395	1812		1126	1553		716	3482		229	3462	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	109	122	22	188	64	308	41	1336	125	136	574	74
RTOR Reduction (vph)	0	7	0	0	43	0	0	7	0	0	10	0
Lane Group Flow (vph)	109	137	0	188	329	0	41	1454	0	136	638	0
Confl. Peds. (#/hr)	39		11	11		39	11		9	9		11
Confl. Bikes (#/hr)			5			8			1			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	22.6	22.6		22.6	22.6		58.8	58.8		58.8	58.8	
Effective Green, g (s)	22.6	22.6		22.6	22.6		58.8	58.8		58.8	58.8	
Actuated g/C Ratio	0.25	0.25		0.25	0.25		0.65	0.65		0.65	0.65	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.6	4.6		4.6	4.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	99	455		282	389		467	2274		149	2261	
v/s Ratio Prot		0.08			0.21			0.42			0.18	
v/s Ratio Perm	c0.28			0.17			0.06			c0.59		
v/c Ratio	1.10	0.30		0.67	0.85		0.09	0.64		0.91	0.28	
Uniform Delay, d1	33.7	27.3		30.3	32.1		5.7	9.3		13.4	6.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.50	1.08	
Incremental Delay, d2	120.3	0.1		4.6	14.9		0.4	1.4		51.2	0.3	
Delay (s)	154.0	27.4		34.9	47.0		6.1	10.7		71.3	7.4	
Level of Service	F	C		C	D		A	B		E	A	
Approach Delay (s)		82.0			42.9			10.6			18.5	
Approach LOS		F			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.6
Intersection Capacity Utilization	91.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	2	21	29	18	61	30	757	25	27	539	340
Future Volume (vph)	154	2	21	29	18	61	30	757	25	27	539	340
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2			4.2		4.6	4.6		4.6	4.6	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			0.99		1.00	1.00		1.00	0.97	
Flpb, ped/bikes		1.00			1.00		0.99	1.00		0.99	1.00	
Frt		0.98			0.92		1.00	1.00		1.00	0.94	
Flt Protected		0.96			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1752			1674		1747	3515		1749	3234	
Flt Permitted		0.65			0.91		0.27	1.00		0.31	1.00	
Satd. Flow (perm)		1179			1540		497	3515		568	3234	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	167	2	23	32	20	66	33	823	27	29	586	370
RTOR Reduction (vph)	0	7	0	0	52	0	0	2	0	0	71	0
Lane Group Flow (vph)	0	185	0	0	66	0	33	848	0	29	885	0
Confl. Peds. (#/hr)			9	9			36		28	28		36
Confl. Bikes (#/hr)			2			2			1			9
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		18.8			18.8		62.4	62.4		62.4	62.4	
Effective Green, g (s)		18.8			18.8		62.4	62.4		62.4	62.4	
Actuated g/C Ratio		0.21			0.21		0.69	0.69		0.69	0.69	
Clearance Time (s)		4.2			4.2		4.6	4.6		4.6	4.6	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		246			321		344	2437		393	2242	
v/s Ratio Prot								0.24			c0.27	
v/s Ratio Perm		c0.16			0.04		0.07			0.05		
v/c Ratio		0.75			0.20		0.10	0.35		0.07	0.39	
Uniform Delay, d1		33.4			29.4		4.5	5.6		4.5	5.8	
Progression Factor		1.00			1.00		0.37	0.48		1.00	1.00	
Incremental Delay, d2		12.2			0.3		0.5	0.4		0.4	0.5	
Delay (s)		45.6			29.7		2.2	3.1		4.8	6.4	
Level of Service		D			C		A	A		A	A	
Approach Delay (s)		45.6			29.7			3.0			6.3	
Approach LOS		D			C			A			A	

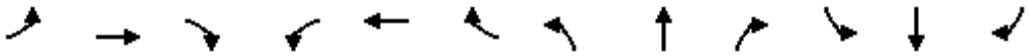
Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.8
Intersection Capacity Utilization	53.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	478	44	19	1452	4	115	46	28	2	62	318
Future Volume (vph)	80	478	44	19	1452	4	115	46	28	2	62	318
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0			3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	0.96		1.00	0.95
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.98	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		1.00	1.00
Satd. Flow (prot)	1770	3478		1770	3537			1760	1527		1859	1503
Flt Permitted	0.95	1.00		0.95	1.00			0.73	1.00		0.99	1.00
Satd. Flow (perm)	1770	3478		1770	3537			1331	1527		1852	1503
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	84	503	46	20	1528	4	121	48	29	2	65	335
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	23	0	0	108
Lane Group Flow (vph)	84	544	0	20	1532	0	0	169	6	0	67	227
Confl. Peds. (#/hr)	16		13	13		16	21		14	14		21
Confl. Bikes (#/hr)			2			1			2			6
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	8.3	76.3		2.6	70.6			21.1	21.1		21.1	21.1
Effective Green, g (s)	8.3	76.3		2.6	70.6			21.1	21.1		21.1	21.1
Actuated g/C Ratio	0.08	0.69		0.02	0.64			0.19	0.19		0.19	0.19
Clearance Time (s)	3.0	4.0		3.0	4.0			3.0	3.0		3.0	3.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	133	2412		41	2270			255	292		355	288
v/s Ratio Prot	c0.05	0.16		0.01	c0.43							
v/s Ratio Perm								0.13	0.00		0.04	c0.15
v/c Ratio	0.63	0.23		0.49	0.67			0.66	0.02		0.19	0.79
Uniform Delay, d1	49.4	6.1		53.0	12.4			41.2	36.1		37.3	42.3
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	9.4	0.2		8.9	1.6			6.3	0.0		0.3	13.2
Delay (s)	58.8	6.3		61.9	14.1			47.5	36.1		37.5	55.6
Level of Service	E	A		E	B			D	D		D	E
Approach Delay (s)		13.3			14.7			45.8			52.5	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	84.0%	ICU Level of Service	E
Analysis Period (min)	15		

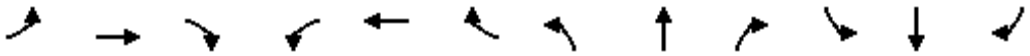
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	185	16	169	30	7	21	295	623	45	42	451	209
Future Volume (vph)	185	16	169	30	7	21	295	623	45	42	451	209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.97			0.88		1.00	0.99		1.00	0.95	
Flpb, ped/bikes	0.72	1.00			1.00		1.00	1.00		0.96	1.00	
Frt	1.00	0.86			0.95		1.00	0.99		1.00	0.95	
Flt Protected	0.95	1.00			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1279	1555			1525		1770	1835		1694	1692	
Flt Permitted	0.76	1.00			0.78		0.10	1.00		0.31	1.00	
Satd. Flow (perm)	1028	1555			1229		189	1835		545	1692	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	231	20	211	38	9	26	369	779	56	52	564	261
RTOR Reduction (vph)	0	158	0	0	20	0	0	3	0	0	21	0
Lane Group Flow (vph)	231	73	0	0	54	0	369	832	0	53	804	0
Confl. Peds. (#/hr)	164		2	2		164	52		70	70		52
Confl. Bikes (#/hr)			8						5			17
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		5	2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	20.0	20.0			20.0		51.0	51.0		35.0	35.0	
Effective Green, g (s)	20.0	20.0			20.0		51.0	51.0		35.0	35.0	
Actuated g/C Ratio	0.25	0.25			0.25		0.64	0.64		0.44	0.44	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	257	388			307		347	1169		238	740	
v/s Ratio Prot		0.05					c0.15	0.45			0.48	
v/s Ratio Perm	c0.22				0.04		c0.52			0.10		
v/c Ratio	0.90	0.19			0.17		1.06	0.71		0.22	1.09	
Uniform Delay, d1	29.0	23.6			23.5		24.4	9.6		14.0	22.5	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.6	0.2			0.3		66.1	3.7		0.5	59.1	
Delay (s)	59.7	23.8			23.8		90.5	13.3		14.5	81.6	
Level of Service	E	C			C		F	B		B	F	
Approach Delay (s)		41.8			23.8			37.0			77.6	
Approach LOS		D			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	51.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	97.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	593	802	48	342	31	313	691	57	70	673	56
Future Volume (vph)	119	593	802	48	342	31	313	691	57	70	673	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	4.2	4.2		4.2	4.6		4.2	4.6	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	0.99	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1765	3539	1524	1754	3490		1770	3483		1770	3489	
Flt Permitted	0.49	1.00	1.00	0.34	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	914	3539	1524	629	3490		1770	3483		1770	3489	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	123	611	827	49	353	32	323	712	59	72	694	58
RTOR Reduction (vph)	0	0	200	0	7	0	0	8	0	0	8	0
Lane Group Flow (vph)	123	611	627	49	378	0	323	763	0	72	744	0
Confl. Peds. (#/hr)	5		27	27		5	22		20	20		22
Confl. Bikes (#/hr)			4			2			11			3
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)	35.1	35.1	35.1	35.1	35.1		11.8	28.1		8.8	25.1	
Effective Green, g (s)	35.1	35.1	35.1	35.1	35.1		11.8	28.1		8.8	25.1	
Actuated g/C Ratio	0.41	0.41	0.41	0.41	0.41		0.14	0.33		0.10	0.30	
Clearance Time (s)	4.2	4.2	4.2	4.2	4.2		4.2	4.6		4.2	4.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	377	1461	629	259	1441		245	1151		183	1030	
v/s Ratio Prot		0.17			0.11		c0.18	c0.22		0.04	0.21	
v/s Ratio Perm	0.13		c0.41	0.08								
v/c Ratio	0.33	0.42	1.00	0.19	0.26		1.32	0.66		0.39	0.72	
Uniform Delay, d1	16.9	17.7	24.9	15.9	16.4		36.6	24.4		35.6	26.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.21	1.07		0.98	1.12	
Incremental Delay, d2	0.5	0.2	35.0	0.4	0.1		162.3	2.1		1.2	3.7	
Delay (s)	17.4	17.9	59.9	16.2	16.5		206.6	28.3		36.2	33.8	
Level of Service	B	B	E	B	B		F	C		D	C	
Approach Delay (s)		40.1			16.5			80.9			34.0	
Approach LOS		D			B			F			C	

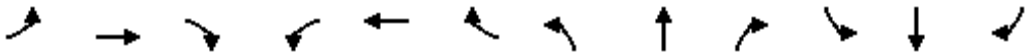
Intersection Summary			
HCM 2000 Control Delay	47.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	96.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	186	205	53	164	167	319	55	536	142	392	911	189
Future Volume (vph)	186	205	53	164	167	319	55	536	142	392	911	189
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.94		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	0.98	1.00		0.99	1.00		1.00	1.00		0.98	1.00	
Frt	1.00	0.97		1.00	0.90		1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1728	1790		1743	1583		1762	3368		1736	3415	
Flt Permitted	0.21	1.00		0.49	1.00		0.15	1.00		0.32	1.00	
Satd. Flow (perm)	382	1790		891	1583		275	3368		586	3415	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	200	220	57	176	180	343	59	576	153	422	980	203
RTOR Reduction (vph)	0	11	0	0	80	0	0	28	0	0	21	0
Lane Group Flow (vph)	200	266	0	176	443	0	59	701	0	422	1162	0
Confl. Peds. (#/hr)	75		24	24		75	20		29	29		20
Confl. Bikes (#/hr)			11			7			4			5
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	32.0	32.0		32.0	32.0		44.4	44.4		44.4	44.4	
Effective Green, g (s)	32.0	32.0		32.0	32.0		44.4	44.4		44.4	44.4	
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.52	0.52		0.52	0.52	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.6	4.6		4.6	4.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	143	673		335	595		143	1759		306	1783	
v/s Ratio Prot		0.15			0.28			0.21			0.34	
v/s Ratio Perm	c0.52			0.20			0.21			c0.72		
v/c Ratio	1.40	0.39		0.53	0.74		0.41	0.40		1.38	0.65	
Uniform Delay, d1	26.5	19.4		20.6	23.0		12.4	12.2		20.3	14.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.87	0.80	
Incremental Delay, d2	216.0	0.1		0.7	4.4		8.6	0.7		182.8	1.1	
Delay (s)	242.5	19.5		21.3	27.3		20.9	12.9		200.4	12.9	
Level of Service	F	B		C	C		C	B		F	B	
Approach Delay (s)		113.0			25.8			13.5			62.2	
Approach LOS		F			C			B			E	

Intersection Summary			
HCM 2000 Control Delay	51.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.38		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.6
Intersection Capacity Utilization	98.0%	ICU Level of Service	F
Analysis Period (min)	15		

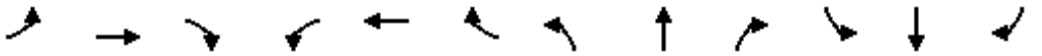
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	72	72	47	52	264	44	781	46	60	762	278
Future Volume (vph)	109	72	72	47	52	264	44	781	46	60	762	278
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2			4.2		4.1	4.1		4.1	4.1	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.96			0.90		1.00	0.99		1.00	0.96	
Flt Protected		0.98			0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1753			1669		1770	3509		1770	3397	
Flt Permitted		0.50			0.92		0.19	1.00		0.27	1.00	
Satd. Flow (perm)		900			1549		356	3509		499	3397	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	120	79	79	52	57	290	48	858	51	66	837	305
RTOR Reduction (vph)	0	20	0	0	78	0	0	4	0	0	33	0
Lane Group Flow (vph)	0	258	0	0	321	0	48	905	0	66	1109	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		24.2			24.2		52.5	52.5		52.5	52.5	
Effective Green, g (s)		24.2			24.2		52.5	52.5		52.5	52.5	
Actuated g/C Ratio		0.28			0.28		0.62	0.62		0.62	0.62	
Clearance Time (s)		4.2			4.2		4.1	4.1		4.1	4.1	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		256			441		219	2167		308	2098	
v/s Ratio Prot								0.26			c0.33	
v/s Ratio Perm		c0.29			0.21		0.13			0.13		
v/c Ratio		1.01			0.73		0.22	0.42		0.21	0.53	
Uniform Delay, d1		30.4			27.4		7.2	8.4		7.2	9.2	
Progression Factor		1.00			1.00		0.51	0.44		1.00	1.00	
Incremental Delay, d2		58.2			5.9		2.0	0.5		1.6	1.0	
Delay (s)		88.6			33.3		5.7	4.2		8.7	10.2	
Level of Service		F			C		A	A		A	B	
Approach Delay (s)		88.6			33.3			4.3			10.1	
Approach LOS		F			C			A			B	

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	8.3
Intersection Capacity Utilization	92.1%	ICU Level of Service	F
Analysis Period (min)	15		

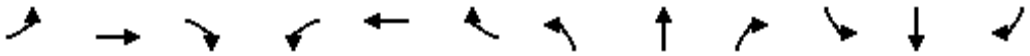
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	186	1461	117	35	641	2	99	68	111	7	57	253
Future Volume (vph)	186	1461	117	35	641	2	99	68	111	7	57	253
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0			3.0	3.0		3.0	3.0
Lane Util. Factor	1.00	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00			1.00	0.94		1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00			0.98	1.00		1.00	1.00
Frt	1.00	0.99		1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.99	1.00
Satd. Flow (prot)	1770	3471		1770	3537			1781	1494		1848	1518
Flt Permitted	0.95	1.00		0.95	1.00			0.76	1.00		0.97	1.00
Satd. Flow (perm)	1770	3471		1770	3537			1390	1494		1805	1518
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	192	1506	121	36	661	2	102	70	114	7	59	261
RTOR Reduction (vph)	0	4	0	0	0	0	0	0	95	0	0	218
Lane Group Flow (vph)	192	1623	0	36	663	0	0	172	19	0	66	43
Confl. Peds. (#/hr)	15		30	30		15	18		22	22		18
Confl. Bikes (#/hr)			2			2			7			
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases	1	6		5	2			4			8	
Permitted Phases							4		4	8		8
Actuated Green, G (s)	17.6	80.7		5.4	68.5			18.9	18.9		18.9	18.9
Effective Green, g (s)	17.6	80.7		5.4	68.5			18.9	18.9		18.9	18.9
Actuated g/C Ratio	0.15	0.70		0.05	0.60			0.16	0.16		0.16	0.16
Clearance Time (s)	3.0	4.0		3.0	4.0			3.0	3.0		3.0	3.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	270	2435		83	2106			228	245		296	249
v/s Ratio Prot	c0.11	c0.47		0.02	0.19							
v/s Ratio Perm								c0.12	0.01		0.04	0.03
v/c Ratio	0.71	0.67		0.43	0.31			0.75	0.08		0.22	0.17
Uniform Delay, d1	46.3	9.6		53.3	11.6			45.8	40.7		41.7	41.3
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	8.5	1.5		3.6	0.4			13.2	0.1		0.4	0.3
Delay (s)	54.8	11.1		56.9	12.0			59.0	40.8		42.1	41.7
Level of Service	D	B		E	B			E	D		D	D
Approach Delay (s)		15.7			14.3			51.8			41.7	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	21.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

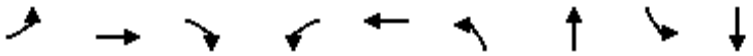


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	291	13	254	26	16	26	148	675	44	30	503	208
Future Volume (vph)	291	13	254	26	16	26	148	675	44	30	503	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.97			0.95		1.00	1.00		1.00	0.96	
Flpb, ped/bikes	0.90	1.00			1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.86			0.95		1.00	0.99		1.00	0.96	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1587	1544			1636		1770	1841		1759	1714	
Flt Permitted	0.77	1.00			0.83		0.10	1.00		0.32	1.00	
Satd. Flow (perm)	1283	1544			1387		182	1841		587	1714	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	313	14	273	28	17	28	159	726	47	32	541	224
RTOR Reduction (vph)	0	200	0	0	20	0	0	3	0	0	17	0
Lane Group Flow (vph)	313	87	0	0	53	0	159	770	0	32	748	0
Confl. Peds. (#/hr)	61		3	3		61	47		9	9		47
Confl. Bikes (#/hr)			7			7			27			8
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		8			4		5	2			6	
Permitted Phases	8			4			2			6		
Actuated Green, G (s)	21.5	21.5			21.5		49.5	49.5		36.5	36.5	
Effective Green, g (s)	21.5	21.5			21.5		49.5	49.5		36.5	36.5	
Actuated g/C Ratio	0.27	0.27			0.27		0.62	0.62		0.46	0.46	
Clearance Time (s)	4.5	4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	344	414			372		281	1139		267	782	
v/s Ratio Prot		0.06					0.06	c0.42			c0.44	
v/s Ratio Perm	c0.24				0.04		0.29			0.05		
v/c Ratio	0.91	0.21			0.14		0.57	0.68		0.12	0.96	
Uniform Delay, d1	28.3	22.7			22.2		14.4	10.0		12.5	21.0	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	26.7	0.3			0.2		2.6	3.2		0.2	21.9	
Delay (s)	55.1	22.9			22.4		17.0	13.2		12.7	42.8	
Level of Service	E	C			C		B	B		B	D	
Approach Delay (s)		39.7			22.4			13.9			41.6	
Approach LOS		D			C			B			D	

Intersection Summary			
HCM 2000 Control Delay	29.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	88.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

QUEUE LENGTH CALCULATIONS



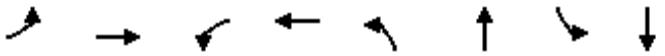
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	59	260	208	65	619	907	786	44	542
v/c Ratio	0.58	0.29	0.39	0.26	0.71	1.32	0.40	0.29	0.70
Control Delay	51.8	27.2	5.8	27.9	34.2	180.3	16.7	43.6	32.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0
Total Delay	51.8	27.2	5.8	27.9	34.2	180.3	17.0	43.6	32.2
Queue Length 50th (ft)	29	63	0	30	165	~690	169	25	148
Queue Length 95th (ft)	69	87	47	59	202	m#1058	m245	60	124
Internal Link Dist (ft)		358			2521		320		335
Turn Bay Length (ft)	80		70	60		100		70	
Base Capacity (vph)	131	1140	631	328	1130	685	1998	155	1176
Starvation Cap Reductn	0	0	0	0	0	0	591	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.23	0.33	0.20	0.55	1.32	0.56	0.28	0.46

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	109	144	188	372	41	1461	136	648
v/c Ratio	1.10	0.31	0.67	0.86	0.09	0.64	0.91	0.29
Control Delay	155.4	26.2	41.8	46.9	7.5	11.5	80.1	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	155.4	26.2	41.8	46.9	7.5	11.5	80.1	7.7
Queue Length 50th (ft)	61	58	91	164	9	258	83	156
Queue Length 95th (ft)	#166	107	163	#300	22	332	#180	164
Internal Link Dist (ft)		480		608		320		320
Turn Bay Length (ft)	80		120		60		80	
Base Capacity (vph)	114	530	325	489	467	2282	149	2273
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.27	0.58	0.76	0.09	0.64	0.91	0.29

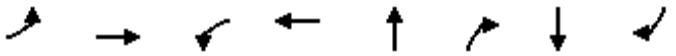
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	192	118	33	850	29	956
v/c Ratio	0.76	0.32	0.10	0.35	0.07	0.41
Control Delay	50.0	15.5	3.0	3.5	6.8	5.6
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	50.0	15.5	3.0	3.6	6.8	5.6
Queue Length 50th (ft)	99	24	2	29	5	74
Queue Length 95th (ft)	156	62	m4	29	19	147
Internal Link Dist (ft)	574	738		335		326
Turn Bay Length (ft)			50		75	
Base Capacity (vph)	461	636	344	2440	394	2312
Starvation Cap Reductn	0	0	0	600	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.19	0.10	0.46	0.07	0.41

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	84	549	20	1532	169	29	67	335
v/c Ratio	0.55	0.22	0.20	0.67	0.66	0.08	0.19	0.84
Control Delay	61.3	7.1	54.5	16.4	52.5	0.5	35.7	43.7
Queue Delay	0.0	0.0	0.0	3.5	0.0	0.0	0.0	0.0
Total Delay	61.3	7.1	54.5	19.9	52.5	0.5	35.7	43.7
Queue Length 50th (ft)	57	51	14	354	111	0	40	141
Queue Length 95th (ft)	109	122	40	535	167	2	72	229
Internal Link Dist (ft)		962		358	240		574	
Turn Bay Length (ft)	180		70			90		90
Base Capacity (vph)	169	2472	99	2289	365	469	508	510
Starvation Cap Reductn	0	0	0	645	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.22	0.20	0.93	0.46	0.06	0.13	0.66

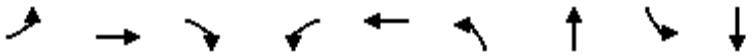
Intersection Summary

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	231	231	73	369	835	53	825
v/c Ratio	0.90	0.42	0.22	1.06	0.71	0.22	1.08
Control Delay	67.4	7.4	18.4	89.1	14.2	17.1	81.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.4	7.4	18.4	89.1	14.2	17.1	81.6
Queue Length 50th (ft)	110	7	18	~168	252	16	~459
Queue Length 95th (ft)	#194	43	44	#272	306	36	#556
Internal Link Dist (ft)		2521	32		336		271
Turn Bay Length (ft)	240			95		50	
Base Capacity (vph)	269	564	341	348	1174	239	761
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.41	0.21	1.06	0.71	0.22	1.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



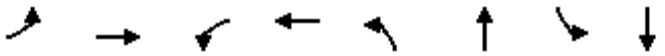
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	123	611	827	49	385	323	771	72	752
v/c Ratio	0.33	0.42	1.00	0.19	0.27	1.32	0.65	0.31	0.72
Control Delay	21.9	19.8	48.8	20.7	17.6	199.1	27.3	36.7	32.8
Queue Delay	0.0	0.0	3.5	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	21.9	19.8	52.3	20.7	17.6	199.1	27.5	36.7	32.8
Queue Length 50th (ft)	43	118	293	16	66	~234	185	39	117
Queue Length 95th (ft)	99	185	#607	47	112	m#335	m200	m72	275
Internal Link Dist (ft)		358			2521		320		335
Turn Bay Length (ft)	80		70	60		100		70	
Base Capacity (vph)	377	1460	828	259	1448	245	1342	229	1287
Starvation Cap Reductn	0	0	11	0	0	0	104	0	0
Spillback Cap Reductn	0	0	11	4	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.42	1.01	0.19	0.27	1.32	0.62	0.31	0.58

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	200	277	176	523	59	729	422	1183
v/c Ratio	1.40	0.40	0.53	0.77	0.41	0.41	1.38	0.66
Control Delay	242.9	20.4	27.6	26.7	23.4	12.0	204.6	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.5
Total Delay	242.9	20.4	27.6	26.7	23.4	12.0	204.6	15.2
Queue Length 50th (ft)	~144	99	72	184	18	106	~306	229
Queue Length 95th (ft)	#275	165	138	#331	57	147	m#352	m263
Internal Link Dist (ft)		480		608		320		320
Turn Bay Length (ft)	80		120		60		80	
Base Capacity (vph)	143	684	335	676	143	1788	306	1803
Starvation Cap Reductn	0	0	0	0	0	0	0	474
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.40	0.40	0.53	0.77	0.41	0.41	1.38	0.89

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

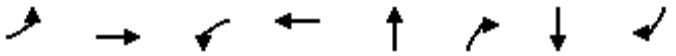
Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	278	399	48	909	66	1142
v/c Ratio	1.01	0.77	0.22	0.42	0.21	0.54
Control Delay	83.6	29.4	7.8	4.8	12.3	11.0
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	83.6	29.4	7.8	5.1	12.3	11.0
Queue Length 50th (ft)	~136	142	3	22	14	152
Queue Length 95th (ft)	#239	207	m41	281	48	279
Internal Link Dist (ft)	574	738		335		326
Turn Bay Length (ft)			50		75	
Base Capacity (vph)	385	698	219	2174	308	2133
Starvation Cap Reductn	0	0	0	555	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.57	0.22	0.56	0.21	0.54

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	192	1627	36	663	172	114	66	261
v/c Ratio	0.71	0.66	0.30	0.31	0.76	0.33	0.22	0.56
Control Delay	60.0	12.7	56.7	13.6	65.6	9.6	41.4	9.5
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0
Total Delay	60.0	12.7	56.7	14.0	65.6	9.6	41.4	9.5
Queue Length 50th (ft)	137	340	26	121	123	0	43	0
Queue Length 95th (ft)	204	548	59	207	187	47	79	68
Internal Link Dist (ft)		962		358	240		574	
Turn Bay Length (ft)	180		70			90		90
Base Capacity (vph)	344	2477	121	2107	369	482	480	595
Starvation Cap Reductn	0	0	0	871	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.66	0.30	0.54	0.47	0.24	0.14	0.44

Intersection Summary

Lane Group	EBL	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	313	287	73	159	773	32	765
v/c Ratio	0.91	0.47	0.19	0.56	0.68	0.12	0.96
Control Delay	60.2	6.5	16.3	18.4	14.1	15.5	46.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.2	6.5	16.3	18.4	14.1	15.5	46.8
Queue Length 50th (ft)	148	5	17	31	233	9	353
Queue Length 95th (ft)	#292	61	48	82	362	28	#624
Internal Link Dist (ft)		2521	32		336		271
Turn Bay Length (ft)	240			95		50	
Base Capacity (vph)	360	630	410	321	1140	267	798
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.46	0.18	0.50	0.68	0.12	0.96

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX F – NCHRP INTERNAL TRIP CAPTURE CALCULATIONS

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	1188 East 14th Street Mixed-Use Development	**Organization:**	CHS Consulting Group
Project Location:	1188 East 14th Street, San Leandro, CA	**Performed By:**	Ben Miller
Scenario Description:	Baseline plus Project Conditions	**Date:**	10/8/2020
Analysis Year:	2020	**Checked By:**	Charles Felder
Analysis Period:	**AM Street Peak Hour**	**Date:**	10/9/2020

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	820/850/911	27,321		198	104	93
Restaurant	936	1,547		6	4	2
Cinema/Entertainment				0		
Residential	231		196	59	16	43
Hotel				0		
All Other Land Uses[2]						
				263	124	138

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		2	0	0	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	1	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	262	124	138
Internal Capture Percentage	2%	2%	2%
External Vehicle-Trips[5]	256	121	135
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	0%	2%
Restaurant	75%	0%
Cinema/Entertainment	N/A	N/A
Residential	0%	2%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Project Name:	1188 East 14th Street Mixed-Use Development
Analysis Period:	**AM Street Peak Hour**

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	104	104	1.00	93	93
Restaurant	1.00	4	4	1.00	2	2
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	16	16	1.00	43	43
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	27		12	0	13	0
Restaurant	1	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	1	0	9	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		33	1	0	0	0
Retail	0		2	0	0	0
Restaurant	0	8		0	1	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	18	1	0		0
Hotel	0	4	0	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	0	104	104	104	0	0
Restaurant	3	1	4	1	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	16	16	16	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	2	91	93	91	0	0
Restaurant	0	2	2	2	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	1	42	43	42	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	1188 East 14th Street Mixed-Use Development	**Organization:**	CHS Consulting Group
Project Location:	1188 East 14th Street, San Leandro, CA	**Performed By:**	Ben Miller
Scenario Description:	Baseline plus Project Conditions	**Date:**	10/8/2020
Analysis Year:	2020	**Checked By:**	Charles Felder
Analysis Period:	**PM Street Peak Hour**	**Date:**	10/9/2020

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	820/850/911	27,302		292	144	148
Restaurant	936	1,547		122	62	60
Cinema/Entertainment				0		
Residential	231		196	71	49	21
Hotel				0		
All Other Land Uses[2]						
				485	255	229

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office					0	
Retail					0	
Restaurant					0	
Cinema/Entertainment					0	
Residential		0	0			
Hotel					0	

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		18	0	23	0
Restaurant	0	25		0	8	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	9	4	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	484	255	229
Internal Capture Percentage	36%	34%	38%
External Vehicle-Trips[5]	310	168	142
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	24%	28%
Restaurant	35%	55%
Cinema/Entertainment	N/A	N/A
Residential	63%	62%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Manual*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.

[3]Enter trips assuming no transit or non-motorized trips (as assumed in ITE *Trip Generation Manual*).

[4]Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be

[5]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.

[6]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Project Name:	1188 East 14th Street Mixed-Use Development
Analysis Period:	**PM Street Peak Hour**

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.00	144	144	1.00	148	148
Restaurant	1.00	62	62	1.00	60	60
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	49	49	1.00	21	21
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	3		43	6	38	7
Restaurant	2	25		5	11	4
Cinema/Entertainment	0	0	0		0	0
Residential	1	9	4	0		1
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		12	1	0	2	0
Retail	0		18	0	23	0
Restaurant	0	72		0	8	0
Cinema/Entertainment	0	6	2		2	0
Residential	0	14	9	0		0
Hotel	0	3	3	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	34	110	144	110	0	0
Restaurant	22	40	62	40	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	31	18	49	18	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	41	107	148	107	0	0
Restaurant	33	27	60	27	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	13	8	21	8	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

APPENDIX G – DETAILED PROJECT SITE PLANS

RESIDENTIAL SUMMARY TABLE

SAN LEANDRO - UNIT AND AREA SUMMARY **2006**
08.28.2020

CONSTRUCTION TYPE: TYPE VA OVER TYPE IA
FLOORS: 3 WOOD OVER 2...

UNIT TYPE	NAME	SCHEME #	DESCRIBE	Unit Net Rentable	1ST	2ND	3RD	4TH	5TH	Unit Total		Rentable Area by Type
STUDIO	S1	N/A	STUDIO	425 SF	-	-	18	18	17	53	27.0%	22,525 SF
	S2	N/A	STUDIO	467 SF	-	-	3	2	2	7	3.6%	3,269 SF
STUDIO SUB-TOTAL					0	0	21	20	19	**60**	**30.6%**	25,794 SF
1 BEDROOM	A1	N/A	1 BDRM	720 SF	-	-	5	4	4	13	6.6%	9,360 SF
	A2	N/A	1 BDRM	730 SF	-	-	9	10	10	29	14.8%	21,170 SF
	A3	N/A	1 BDRM	639 SF	-	-	4	4	4	12	6.1%	7,668 SF
	A4	N/A	1 BDRM	587 SF	-	-	6	6	6	18	9.2%	10,566 SF
	A5	N/A	1 BDRM	563 SF	-	-	2	4	4	10	5.1%	5,630 SF
	A6	N/A	1 BDRM	695 SF	-	-	1	1	1	3	1.5%	2,085 SF
	A7	N/A	1 BDRM	633 SF	-	-	1	1	1	3	1.5%	1,899 SF
	A8	N/A	1 BDRM	624 SF	-	-	1	1	1	3	1.5%	1,872 SF
	A9	N/A	1 BDRM	642 SF	-	-	1	1	1	3	1.5%	1,926 SF
1 BDRM SUB-TOTAL					0	-	30	32	32	**94**	**48.0%**	62,176 SF
2 BEDROOM	B1	N/A	2 BDRM/ 2 BATH	817 SF	-	-	5	5	5	15	7.7%	12,255 SF
	B2	N/A	2 BDRM/ 2 BATH	934 SF	-	-	3	4	4	11	5.6%	10,274 SF
	B3	N/A	2 BDRM/ 2 BATH	1,000 SF	-	-	2	2	2	6	3.1%	6,000 SF
	B4	N/A	2 BDRM/ 2 BATH	937 SF	-	-	1	1	1	3	1.5%	2,811 SF
2 BDRM SUB-TOTAL					0	-	11	12	12	**35**	**17.9%**	31,340 SF
3 BEDROOM	C1	N/A	3 BDRM/ 2 BATH	1,159 SF	-	-	1	1	1	3	1.5%	3,477 SF
	C2	N/A	3 BDRM/ 2 BATH	1,163 SF	-	-	-	-	2	2	1.0%	2,326 SF
	C3	N/A	3 BDRM/ 2 BATH	1,315 SF	-	-	1	1	-	2	1.0%	2,630 SF
3 BDRM SUB-TOTAL					0	-	2	2	3	**7**	**3.6%**	8,433 SF
TOTAL UNITS			**Avg SqFt**	**652 SF**	0	0	64	66	66	**196**	**100.0%**	127,743 SF

Net rentable residential area is measured center of demising wall, ext face of stud of ext wall, ext face of stud of corridor wall, excl decks

Net rentable Residential by floor (excl decks)	-	-	41,317 SF	42,920 SF	43,506 SF	**127,743 SF**

CAR LIFT INFORMATION

NOISE LEVEL	CITYLIFT PRODUCT	OPERATION	SOUND LEVEL (dBA Leq MEASURED AT 5'-0")
	PUZZLE 2LP (2 LEVELS BY 3 STACKS)	NO MOVEMENT (AMBIENT)	50
		VERTICAL VEHICLE MOVEMENT	59
		HORIZONTAL VEHICLE MOVEMENT	63

RELIABILITY	NOTE FROM THE MANUFACTURER:	The lifts are as reliable as elevators if properly maintained. This is very mature technology – we have lifts still running that were installed 25+ years ago in Tokyo. For example, from a recent compilation of service calls/visits in the Bay Area our puzzle lifts have been performing at a 99.98% uptime over the last 6 months.

SPEED	AVERAGE RETRIEVAL TIME FOR A CAR ON A 2-LEVEL PUZZLE LIFT IS 30 SECONDS

TRASH INFORMATION

PROJECTED COLLECTION SCHEDULE*		
SERVICE:	**CONTAINER VOLUME/TYPE:**	**FREQUENCY:**
WASTE	2 X 2CY FL COMPACTOR CONTAINERS	2X / WEEK
RECYCLING	1 X 2CY FL COMPACTOR CONTAINERS	3X / WEEK
ORGANICS	9 X 96G LOOSE TOTER CARTS	1X / WEEK

*ANALYSIS BY AMERICAN TRASH MANAGEMENT
NOTE: TRASH COMPACTORS TO BE PLACED OUTSIDE FOR CURBSIDE PICK-UP

OPEN SPACE

REQUIRED		PROVIDED	
60 SF / DU PER 2-694 60 SF X 196 DU	= 11,760 SF	COURTYARD DOG AREA PRIVATE BALCONIES + ROOF DECK	13,847 SF 1,197 SF 4,897 SF
		TOTAL OPEN SPACE	**19,941 SF**

LANDSCAPED AREA

LEVEL 1 LANDSCAPED AREA	5,377 SF
LEVEL 3 LANDSCAPED AREA	13,847 SF
TOTAL	**19,224 SF**

GROSS AREA BY FLOOR

NAME	AREA
LEVEL ONE	
RETAIL 1 (Grocery)	23,189 SF
RETAIL 2	2,515 SF
RETAIL 3	1,598 SF
RETAIL 4	1,547 SF
AMENITIES	1,653 SF
PARKING/GARAGE	26,982 SF
BIKE PARKING	123 SF
UTILITIES/BOH	3,898 SF
CIRCULATION (VERTICAL, HORIZONTAL & MISC.)	4,758 SF
TOTAL	66,263 SF
LEVEL TWO	
PARKING/GARAGE	59,457 SF
BIKE PARKING	695 SF
UTILITIES/BOH	1,467 SF
CIRCULATION (VERTICAL, HORIZONTAL & MISC.)	4,201 SF
TOTAL	65,820 SF
LEVEL THREE	
AMENITIES	3,711 SF
RESIDENTIAL	41,317 SF
UTILITIES/BOH	204 SF
CIRCULATION (VERTICAL, HORIZONTAL & MISC.)	6,575 SF
TOTAL	51,807 SF
LEVEL FOUR	
AMENITIES	529 SF
RESIDENTIAL	42,920 SF
UTILITIES/BOH	204 SF
CIRCULATION (VERTICAL, HORIZONTAL & MISC.)	8,146 SF
TOTAL	51,799 SF
LEVEL FIVE	
RESIDENTIAL	43,506 SF
UTILITIES/BOH	204 SF
CIRCULATION (VERTICAL, HORIZONTAL & MISC.)	6,805 SF
TOTAL	50,515 SF
GRAND TOTAL	**286,204 SF**

NOTE: THE FOLLOWING OPEN SPACES HAVE BEEN EXCLUDED FOR THE PURPOSE OF GROSS SQUARE FOOTAGE CALCULATIONS
1.) 2ND FLOOR DOG AREA
2.) 3RD FLOOR COURTYARD
3.) 5TH FLOOR ROOF DECK

DENSITY

ZONING DISTRICT	ALLOWED DENSITY	LOT AREA	ALLOWED UNITS	PROPOSED UNITS
DA-1(S)	100 UNITS / ACRE = 164 + 20% BONUS FOR AVG. UNIT SIZE OF <750 SF = 33	71,640 SF = 1.64 ACRES	197	196

ZONING INFORMATION

ASSESSOR'S PARCEL #: (A) 77-447-7-1
(B) 77-447-14-6
(C) 77-447-14-7
(D) 77-447-15-6

ZONING DISTRICT: DA-1(S)

FAR

LOT AREA: 71,640 SF (1.64 ACRES)

GFA (EXCLUDING PARKING): 199,765 SF

FAR: 2.79

LOT COVERAGE: 66,263 SF (92%)

SITE LANDSCAPE %: 29%

SETBACKS

FRONT AT E. 14TH: 7 FT

SIDE: 0 FT

REAR: 0 FT TO BE CONSISTENT WITH PREVAILING CONDITION

BUILDING INFORMATION

BUILDING ADDRESS: 1188 E. 14TH STREET
SAN LEANDRO, CA 94577

NUMBER OF STORIES: 5

ALLOWABLE HEIGHT: 75'

PROPOSED HEIGHT: 64'-8" TOP OF ROOF, 75'-0" TOP OF PARAPET

CONSTRUCTION TYPE: TYPE VA (3 STORIES)
OVER TYPE I (2 STORIES)

SPRINKLERED: YES

FIRE ALARM: YES

HIGH RISE: NO

OCCUPANCY CLASSIFICATION: R2
S2 (PARKING)
M

PARKING INFORMATION

	REQUIRED	PROVIDED	NOTES
RESIDENTIAL	1.5 SPACES / UNIT 1.5 X 196 UNITS = 294 SPACES	1.11 SPACES / UNIT 216 SPACES (UPPER FLOOR)	
COMMERCIAL	GROCERY: 23,189 SF/500 = 47 SPACES RETAIL: >5000 SF. EXCEMPT (DA DISTRICT)	70 SPACES (GROUND FLOOR)	71 SHARED DAYTIME OVERFLOW STALLS PROVIDED ON 2ND LEVEL
TOTAL	341 SPACES	286 SPACES	4 NONRESIDENTIAL EV CHARGING SPACES PROVIDED PER CGBSC TABLE 5.106.5.3.3

BICYCLE PARKING INFORMATION

	REQUIRED	PROVIDED	COMPLIANT
RESIDENTIAL	NO BICYCLE SPACES REQUIRED FOR RESIDENTIAL	76 LONG-TERM SPACES	Y
COMMERCIAL	5% OF REQUIRED AUTO PARKING .05 X 62 = 4	8 SHORT-TERM SPACES	Y
TOTAL		84 SPACES	

MOTORCYCLE PARKING INFORMATION

	REQUIRED	PROVIDED	COMPLIANT
SHARED	NO MOTORCYCLE SPACES REQUIRED	6 SHARED PUBLIC/PRIVATE SPACES	Y

AMENITIES	SHEET(S)
OPEN SPACE	
-DOG AREA	A2.2,4.7
-COURTYARD	A2.3
-ROOF DECK	A2.5,4.8
USE OF 3+ COLORS	A3.1, A3.2
USE OF 3+ FACADE MATERIALS	A3.1, A3.2
PUBLIC ART	A3.1, A3.2
BICYCLE STORAGE	A2.1 - A2.2
TENANT ACTIVITY AREAS	
-FITNESS/YOGA	A2.3,4.8
-CLUBROOM	A2.3, A4.8
-MEETING/PHONE ROOM	A2.6, A4.8
LEASING OFFICE	A2.1,4.7

GROSS AREA BY USE

NAME	AREA
RETAIL	28,849 SF
AMENITIES	5,893 SF
PARKING/GARAGE	86,439 SF
BIKE PARKING	818 SF
UTILITIES/BOH	5,977 SF
RESIDENTIAL	127,743 SF
CIRCULATION (VERTICAL, HORIZONTAL AND MISC.)	30,485 SF
GRAND TOTAL	**286,204 SF**

NOTE: THE FOLLOWING OPEN SPACES HAVE BEEN EXCLUDED FOR THE PURPOSE OF GROSS SQUARE FOOTAGE CALCULATIONS
1.) 2ND FLOOR DOG AREA
2.) 3RD FLOOR COURTYARD
3.) 5TH FLOOR ROOF DECK

BDE ARCHITECTURE
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Client
14TH & Callan Street Developer LLC

Consultant

CALLAN & E 14TH STREET

1188 E 14TH ST, SAN LEANDRO, CA

Rev	Issue	Date
	PLANNING RESUBMITTAL	08.28.20
	PLANNING RESUBMITTAL	10.14.20

LICENSED ARCHITECT
JONATHAN ENGLISH
No. C37221
REG 5-31-21
STATE OF CALIFORNIA

Stamp

PROJECT DATA

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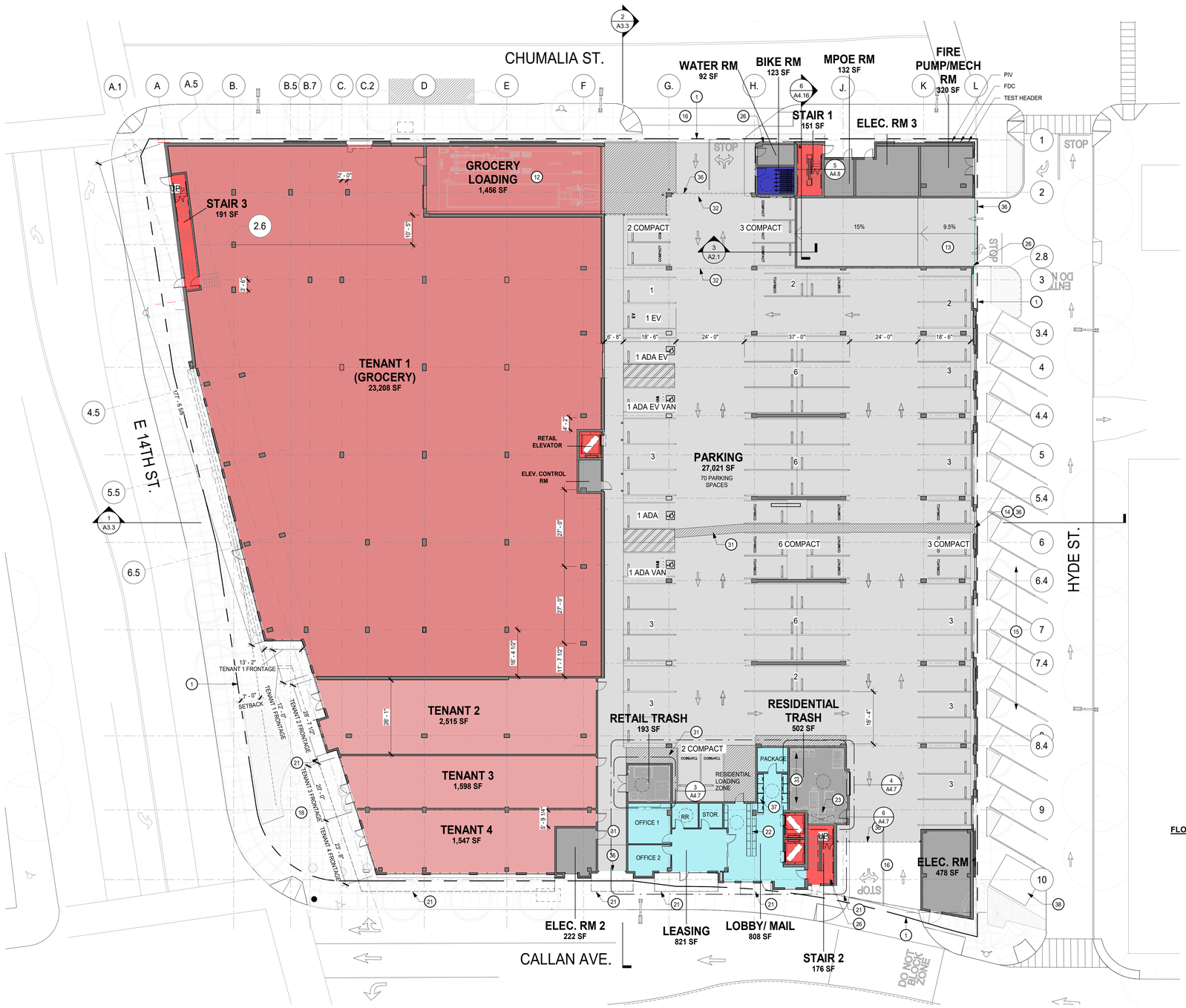
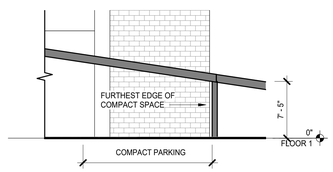


BUILDING PLAN - FLOOR 1 1

1/16" = 1'-0"



BELOW - RAMP VERTICAL CLEARANCE 3

1/8" = 1'-0"

PARKING COUNT

OFF-STREET PARKING LEVEL 1

STANDARD	47
STANDARD EV	1
STACK	0
COMPACT	18
ADA STANDARD	1
ADA VAN	1
ADA EV (VAN + STANDARD)	2
CLEAN AIR/VANPOOL	0
TOTAL LEVEL 1 PARKING	70

HYDE STREET PARKING

STANDARD	19

SHEET NOTES

NOTE: NOT ALL NOTES ARE USED ON EVERY SHEET.

1. (E) PROPERTY LINE
2. PROPERTY LINE
3. (E) STREET LIGHT
4. (E) DRIVEWAY
5. (E) FIRE HYDRANT
6. (N) FIRE HYDRANT
7. (N) TREE, S.L.D.
8. (N) PUBLIC LANDSCAPING, S.L.D.
9. ELEVATOR OVERRUN
10. STAIR TO ROOF
11. FREIGHT ELEVATOR
12. LOADING ZONE
13. RAMP TO 2ND LEVEL PARKING
14. OPENING IN WALL
15. RELOCATED PARKING SPACES ON HYDE ST, S.C.D.
16. VEHICULAR DRIVEWAY
17. WATER FEATURE
18. PUBLIC SEATING AREA
19. DOG WASH
20. PUBLIC SHORT-TERM BIKE PARKING SPACES (8 SPACES)
21. CANOPY
22. 200 MAILBOXES (15/SQUARE)
23. TRASH CHUTES
24. UNDERGROUND COMMERCIAL DISTRIBUTION (UCD)
25. MECHANICAL SYSTEM FOR GARAGE VENTILATION
26. STROBE LIGHT EXIT NOTIFICATION
27. GATE FOR PRIVATE RESIDENTIAL PARKING
28. PRIVATE BALCONY
29. COMMON OUTDOOR SPACE, S.L.D.
30. FIRE LADDER PADS. S.L.D
31. PEDESTRIAN PATH
32. RAMP ABOVE
33. ORGANICS COLLECTION
34. MOTORCYCLE PARKING
35. AFFORDABLE UNIT
36. GARAGE GATE/FENCE
37. LUXOR PACKAGE
38. ELECTRIC PAD MOUNT TRANSFORMER W/ SCREENING
39. ROOF DRAIN
40. ROOF TOP MECHANICAL EQUIPMENT
41. TENANT 1 CONDENSOR
42. EXISTING TREE, S.L.D.
43. (E) STREET PARKING

FLOOR PLAN COLOR LEGEND

- AMENITY
- PARKING
- RETAIL
- STORAGE
- TENANT 1
- UTILITY
- VERTICAL CIRCULATION

BDE ARCHITECTURE
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	PLANNING RESUBMITTAL	10.14.20

LICENSED ARCHITECT JONATHAN EMERY No. C27221 Exp. 8.31.20 STATE OF CALIFORNIA

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LEVEL 1 FLOOR PLAN

Sheet Title

Scale As indicated

Proj #. 2006 Drawn Author

Sheet Size: 30 x 42

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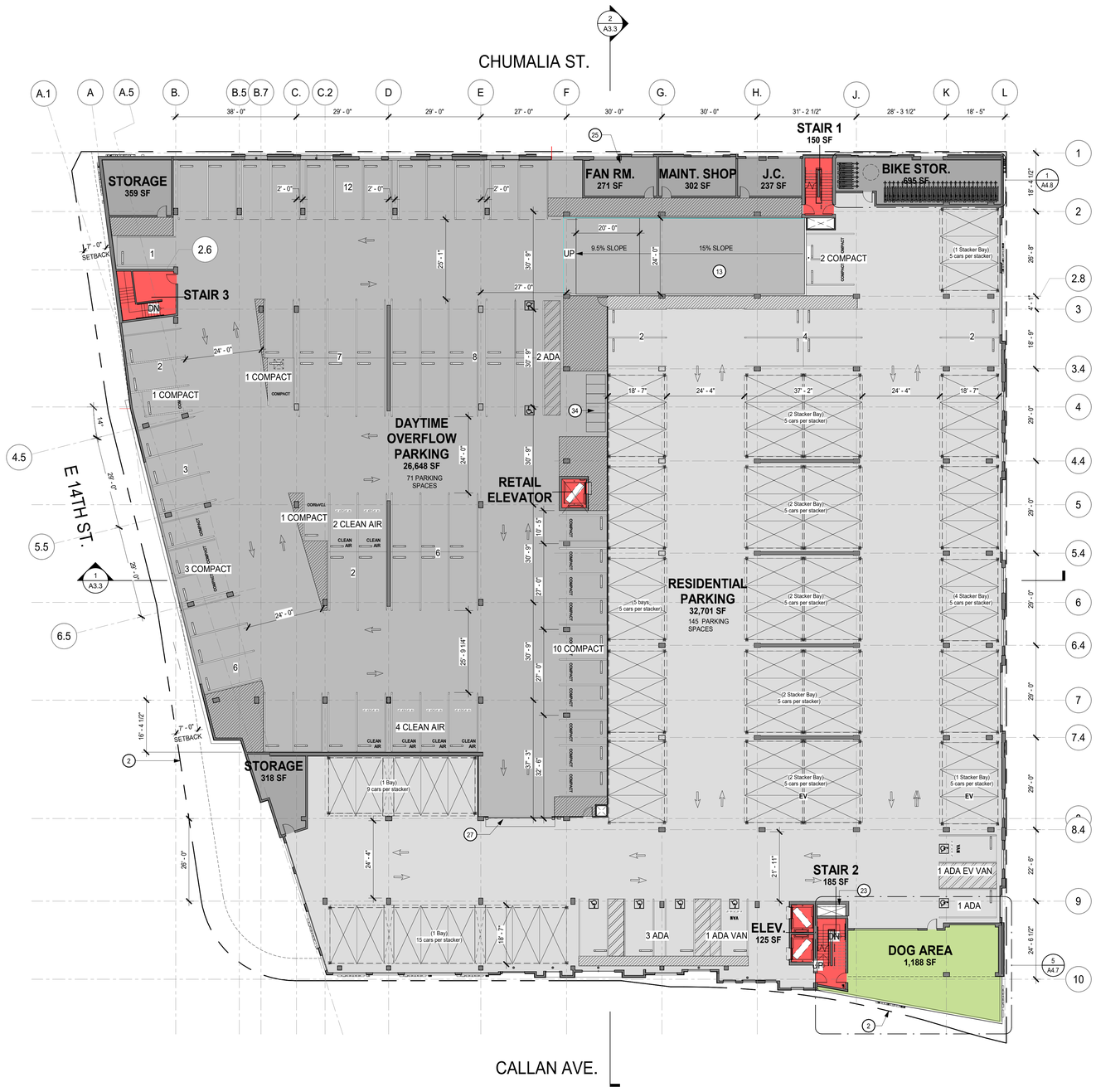
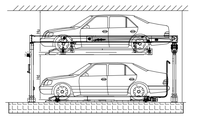


BUILDING PLAN - FLOOR 2 1

1/16" = 1'-0"



PUZZLE STACKER ELEVATIONS 1 2

1/8" = 1'-0"

PARKING COUNT

PARKING LEVEL 2

STANDARD	55
STANDARD EV	21
STACK	108
COMPACT	18
ADA STANDARD	6
ADA VAN	1
ADA EV (VAN + STANDARD)	1
CLEAN AIR/VANPOOL	6
TOTAL LEVEL 2 PARKING	216

SHEET NOTES

NOTE: NOT ALL NOTES ARE USED ON EVERY SHEET.

1. (E) PROPERTY LINE
2. PROPERTY LINE
3. (E) STREET LIGHT
4. (E) DRIVEWAY
5. (E) FIRE HYDRANT
6. (N) FIRE HYDRANT
7. (N) TREE, S.L.D.
8. (N) PUBLIC LANDSCAPING, S.L.D.
9. ELEVATOR OVERRUN
10. STAIR TO ROOF
11. FREIGHT ELEVATOR
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29. COMMON OUTDOOR SPACE, S.L.D.
30. FIRE LADDER PADS.. S.L.D
31. PEDESTRIAN PATH
32. RAMP ABOVE
33. ORGANICS COLLECTION
34. MOTORCYCLE PARKING
35. AFFORDABLE UNIT
36. GARAGE GATE/FENCE
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40. ROOF TOP MECHANICAL EQUIPMENT
41. TENANT 1 CONDENSOR
42. EXISTING TREE, S.L.D.
43. (E) STREET PARKING

FLOOR PLAN COLOR LEGEND

- OPEN SPACE
- PARKING
- PARKING - DAYTIME OVERFLOW
- UTILITY
- VERTICAL CIRCULATION

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LICENSED ARCHITECT JONATHAN ENGEL No. C27221 Exp. 8.31.20 STATE OF CALIFORNIA

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LEVEL 2 FLOOR PLAN

Sheet Title

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