

## APPENDIX G – TRAFFIC IMPACT ASSESSMENT





# HEXAGON TRANSPORTATION CONSULTANTS, INC.



## Chick-fil-A Restaurant on North Livermore Avenue

### Traffic Impact Analysis

Prepared for:

**MPVCA Livermore LLC**

May 1, 2020



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## Executive Summary

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This report presents the results of the Traffic Impact Analysis (TIA) conducted for the proposed Chick-fil-A restaurant located on the northwest corner of the North Livermore Avenue and Arroyo Plaza intersection. The project site is in an unincorporated area that is proposed for annexation into the City of Livermore. The proposed project consists of the construction of a 4,677-square foot restaurant with a drive-through window. Currently, the proposed project site is vacant. The project would include a surface parking lot with 42 parking spaces, and there would be no cross-circulation between the project site and the adjacent property (Jack in the Box) to the south. Access to the project site would be provided via a single full-access driveway that would form the fourth (west) leg of the existing North Livermore Avenue/Arroyo Plaza signalized intersection. The project also proposes to add a northbound left-turn pocket on North Livermore Avenue leading into the project site.

This study was conducted for the purpose of identifying the potential traffic impacts related to the proposed development. The potential impacts of the project were evaluated in accordance with the standards set forth by the City of Livermore. Although the proposed project would require a General Plan amendment, an Alameda County CMP analysis was not required because the net project trip generation would be fewer than 100 peak hour trips. The traffic study includes an analysis of AM and PM peak hour traffic conditions for five signalized intersections and two roadway segments in the vicinity of the project site. The study also includes an analysis of vehicle miles travelled (VMT), as well as transit, bicycle, and pedestrian access.

### Project Trip Generation

Project trip generation was estimated by applying to the size and uses of the development the appropriate trip generation rates obtained from ITE *Trip Generation Manual, 10<sup>th</sup> Edition*. Hexagon previously conducted a trip generation count at a Chick-fil A restaurant at 2280 Monterey Highway in San Jose. The count showed that the Chick-fil A restaurant generated trips at a rate that is lower than the rates published in the ITE *Trip Generation Manual, 10<sup>th</sup> Edition*. Thus, to be conservative, project trips were estimated based on the published ITE trip generation rates rather than the Chick-fil A observed trip rates. Based on ITE average trip generation rates for a fast-food restaurant with a drive-through window (Land Use 934), the proposed development would generate a total of 2,182 daily trips, with 186 trips (95 in and 91 out) occurring during the AM peak hour and 151 trips (79 in and 72 out) occurring during the PM peak hour.

A pass-by trip reduction of 50 percent, as well as a diverted linked trip reduction of 25 percent were applied. Trip reduction percentages were obtained from the ITE *Trip Generation Handbook, Third Edition*. Pass-by trips are trips that would already drive by the site on North Livermore Avenue (and are therefore already counted in the existing traffic) but would turn into the site while passing by. Pass-by trips result in a reduction in through traffic on North Livermore Avenue and an equivalent increase in

trips turning in and out of the project driveway. Diverted linked trips are trips that would be diverted from other study area roadways (such as I-580) to the project site. Although diverted linked trips would add traffic to the segment of North Livermore Avenue between the project site and I-580, the trips would not be new to the study area.

After applying the pass-by and diverted linked trip reductions, the project would generate 545 new primary trips per day, with 46 new primary trips occurring during the AM peak hour and 37 new primary trips occurring during the PM peak hour.

## Intersection Level of Service Analysis

The analysis determined that under all scenarios with and without the project, all but one study intersection are expected to operate at acceptable levels of service. Under cumulative conditions, the intersection of North Livermore Avenue and Portola Road would exceed mid-level LOS D with and without the proposed project during the AM peak hour. However, the project is expected to have an insignificant impact at the intersection. Therefore, the proposed project would not have a significant impact at any of the study intersections.

At some intersections, the average delay is shown to be decreased slightly with the addition of traffic generated by approved developments. Additionally, some study intersections are shown to have a lower average delay under cumulative conditions than under background conditions even though cumulative traffic volumes are projected to be substantially greater than background traffic volumes. This occurs because the intersection delay is a weighted average of all intersection movements. When traffic is added to movements with delays lower than the average intersection delay, the average delay for the entire intersection can decrease.

## Vehicle Miles Travelled

Senate Bill (SB) 743, signed into law in 2013, requires CEQA lead agencies to shift from using traditional LOS standards and automobile delay to determine significant traffic impacts. Since the City of Livermore has not yet adopted a policy or established any thresholds based on VMT, the potential impacts of this project were determined based upon the City of Livermore's adopted LOS-based methodology. Nevertheless, according to the new guidelines, local-serving retail developments such as the proposed project are presumed to have a less than significant impact on VMT since they generally result in shorter trip lengths.

## Site Access and On-Site Circulation

The driveway would have one inbound lane and two outbound lanes (a left-turn lane and a shared through/right-turn lane) with a width of 40 feet (one 16-foot inbound lane and two 12-foot outbound lanes) for a distance of approximately 50 feet. The driveway width would meet the City's minimum requirement of 24 feet for a two-way driveway and will be able to accommodate vehicle turns to and from the site.

## Drive-Through Analysis

The City of Livermore Development Code does not specify requirements for the restaurant drive-through lane. Based on observations of vehicle queues during the peak lunch and dinner hours on a typical weekday and Saturday at two other Chick-fil-A restaurants in San Jose and Fremont, the proposed drive-through stacking space is expected to be sufficient for all time periods. Although the drive-through queue is not expected to overflow the storage space provided, there is ample space on site to accommodate any excess drive-through queue before reaching North Livermore Avenue.

## Parking

The proposed vehicle and bicycle parking supply would meet the minimum parking requirements set forth in the City of Livermore zoning regulations.

## Pedestrian, Bicycle, and Transit Analysis

According to the 2019 Alameda County Congestion Management Program (CMP) Transportation Impact Analysis Technical Guidelines, the proposed project would not have an adverse effect on the existing transit, pedestrian, or bicycle facilities in the study area. The proposed project would enhance bicycle transportation by constructing a new multi-use trail along the southern edge of the site.

## Roadway Segment Analysis

The City of Livermore *General Plan* identifies North Livermore Avenue as a Major Street, which typically carries 20,000 to 50,000 vehicles per day. Under all scenarios, the projected traffic volumes on North Livermore Avenue are expected to remain within the acceptable volume levels described in the General Plan.

## Queuing Analysis

The estimated queue lengths based on the Poisson numerical calculations show queuing deficiencies for some turn pockets.

### **North Livermore Avenue and I-580 WB Ramps**

Under cumulative conditions, the northbound left-turn movement on North Livermore Avenue would exceed the two-lane pocket storage by three vehicles during the PM peak hour and spillback into the North Livermore Avenue/I-580 EB ramps intersection. The proposed project would add four vehicles per lane to the left-turn movement (less than one vehicle per signal cycle). The small increase in traffic volume would not increase the 95<sup>th</sup> percentile queue length. Thus, the project trips would have an insignificant impact on traffic operations at this intersection.

### **North Livermore Avenue and Arroyo Plaza**

The length of the planned new northbound left-turn pocket (approximately 100 feet) would be sufficient to accommodate the 95<sup>th</sup> percentile queue length during both the AM and PM peak hours. However, the eastbound left-turn movement out of the project driveway is expected to exceed the driveway throat length by one vehicle during the AM peak hour and by one vehicle during the PM peak hour.

Outbound queues at the project driveway could extend beyond the driveway throat and past the drive-through exit. A “Keep Clear” pavement marking and a custom caution sign, directing vehicles to wait when eastbound vehicles queues at the North Livermore Avenue/Arroyo Plaza intersection begin to stack, are recommended at the drive-through exit to allow for inbound vehicles to enter the site without interference or delays.

**Table ES 1**  
**Intersection Level of Service Summary**

#	Intersection	Standard <sup>1</sup>	Peak Hour	Count Date	Existing Conditions		Background Conditions		Background plus Project Conditions		Cumulative Conditions		Cumulative plus Project Conditions			
					Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS		
1	N. Livermore Avenue & I-580 Westbound Ramps	LOS E	AM	10-2-2019	17.6	B	17.8	B	18.8	B	1.0	18.2	B	17.9	B	-0.3
			PM	10-2-2019	16.0	B	16.6	B	16.7	B	0.1	16.5	B	16.6	B	0.1
2	N. Livermore Avenue & I-580 Eastbound Ramps	LOS E	AM	10-2-2019	24.4	C	24.3	C	25.2	C	0.9	27.2	C	28.3	C	1.1
			PM	10-2-2019	21.0	C	21.8	C	24.1	C	2.3	46.6	D	50.4	D	3.8
3	N. Livermore Avenue & Arroyo Plaza	LOS E	AM	10-2-2019	6.5	A	6.5	A	12.4	B	5.9	5.7	A	12.7	B	7.0
			PM	10-2-2019	8.5	A	8.4	A	12.4	B	4.0	7.6	A	13.8	B	6.2
4	N. Livermore Avenue & Las Positas Road	LOS E	AM	10-2-2019	26.1	C	26.0	C	26.0	C	0.0	25.4	C	25.3	C	-0.1
			PM	10-2-2019	35.4	D	35.9	D	35.9	D	0.0	38.9	D	39.1	D	0.2
5	N. Livermore Avenue & Portola Avenue	mid-level	AM	10-2-2019	36.2	D	36.3	D	36.5	D	0.2	<b>51.8</b>	<b>D</b>	<b>52.7</b>	<b>D</b>	<b>0.9</b>
		LOS D	PM	10-2-2019	36.9	D	37.0	D	37.3	D	0.3	44.5	D	44.7	D	0.2

Notes:

<sup>1</sup>The City of Livermore LOS standard for signalized intersections is mid-level LOS D (average delay of 45 seconds or less) in most locations. Study intersections 1-4 are near freeway interchanges and are therefore subject to an LOS E standard (average delay of 80 seconds or less).

**BOLD** indicates a substandard level of service

# 1. Introduction

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This report presents the results of the Traffic Impact Analysis (TIA) conducted for the proposed Chick-fil-A restaurant located on the northwest corner of the North Livermore Avenue and Arroyo Plaza intersection. The project site is in an unincorporated area that is proposed for annexation into the City of Livermore. The proposed project consists of the construction of a 4,677-square foot restaurant with a drive-through window. Currently, the proposed project site is vacant. The project would include a surface parking lot with 42 parking spaces. There would be no cross circulation between the project site and the adjacent property (Jack in the Box) to the south. Access to the project site would be provided via a single full-access driveway that would form the fourth (west) leg of the existing North Livermore Avenue/Arroyo Plaza signalized intersection. The project also proposes to add a northbound left-turn pocket on North Livermore Avenue leading into the project site.

The project site and the surrounding study area are shown on Figure 1. The proposed site plan is shown on Figure 2.

## Scope of Study

This study was conducted for the purpose of identifying the potential traffic impacts related to the proposed development. The potential impacts of the project were evaluated in accordance with the standards set forth by the City of Livermore. Although the proposed project would require a General Plan amendment, an Alameda County CMP analysis was not required because the net project trip generation would be fewer than 100 peak hour trips. The traffic study includes an analysis of AM and PM peak-hour traffic conditions for five signalized intersections and two roadway segments in the vicinity of the project site. The study also includes an analysis of vehicle miles travelled (VMT), as well as transit, bicycle, and pedestrian access. The study intersections and roadway segments are identified below.

### Study Intersections

1. North Livermore Avenue and I-580 Westbound Ramps
2. North Livermore Avenue and I-580 Eastbound Ramps
3. North Livermore Avenue and Arroyo Plaza
4. North Livermore Avenue and Las Positas Road
5. North Livermore Avenue and Portola Avenue

### Study Roadway Segments

1. North Livermore Avenue, between Arroyo Plaza and Las Positas Road
2. North Livermore Avenue, between Las Positas Road and Portola Avenue

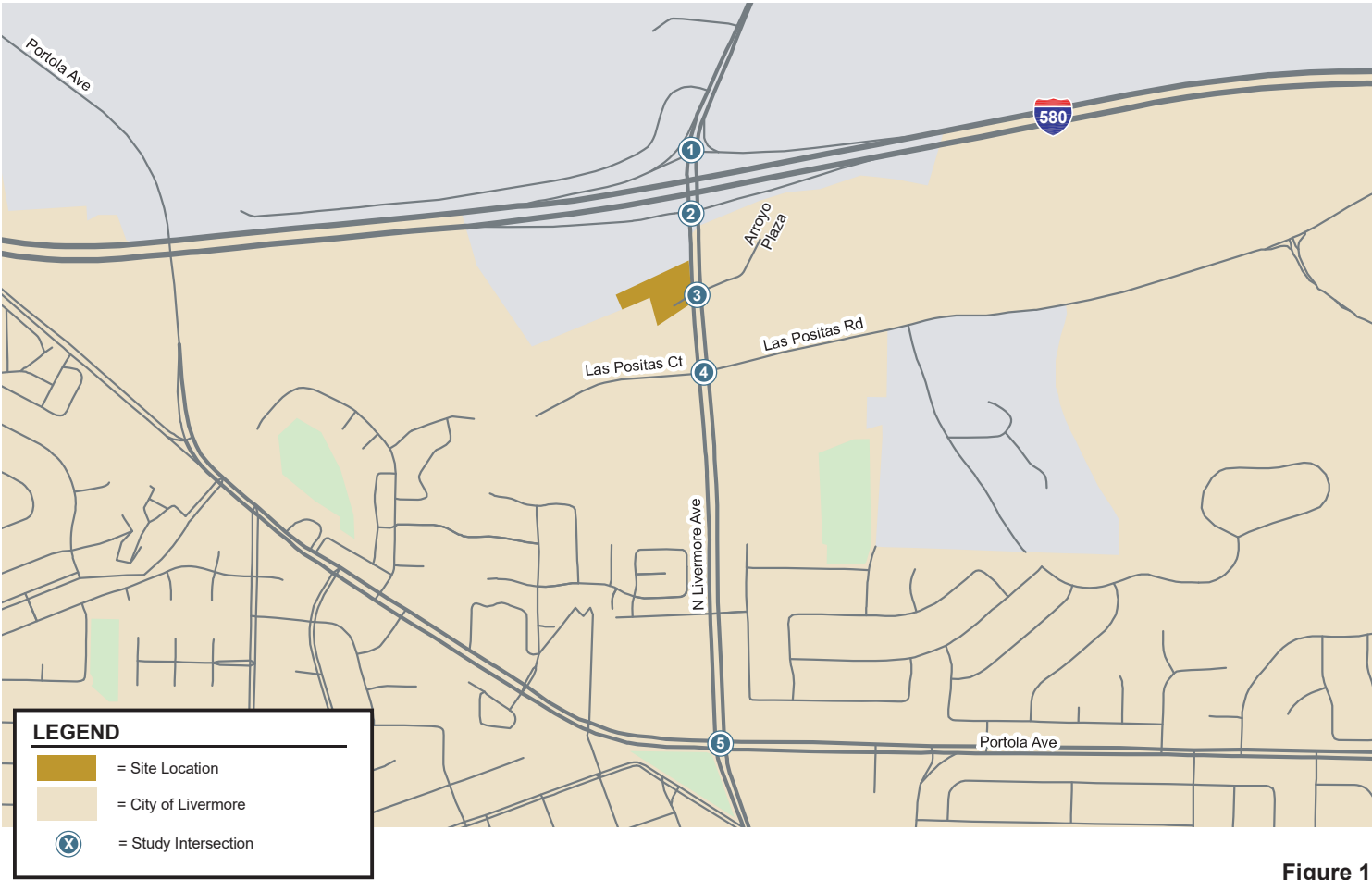


Figure 1  
Study Location and Intersections

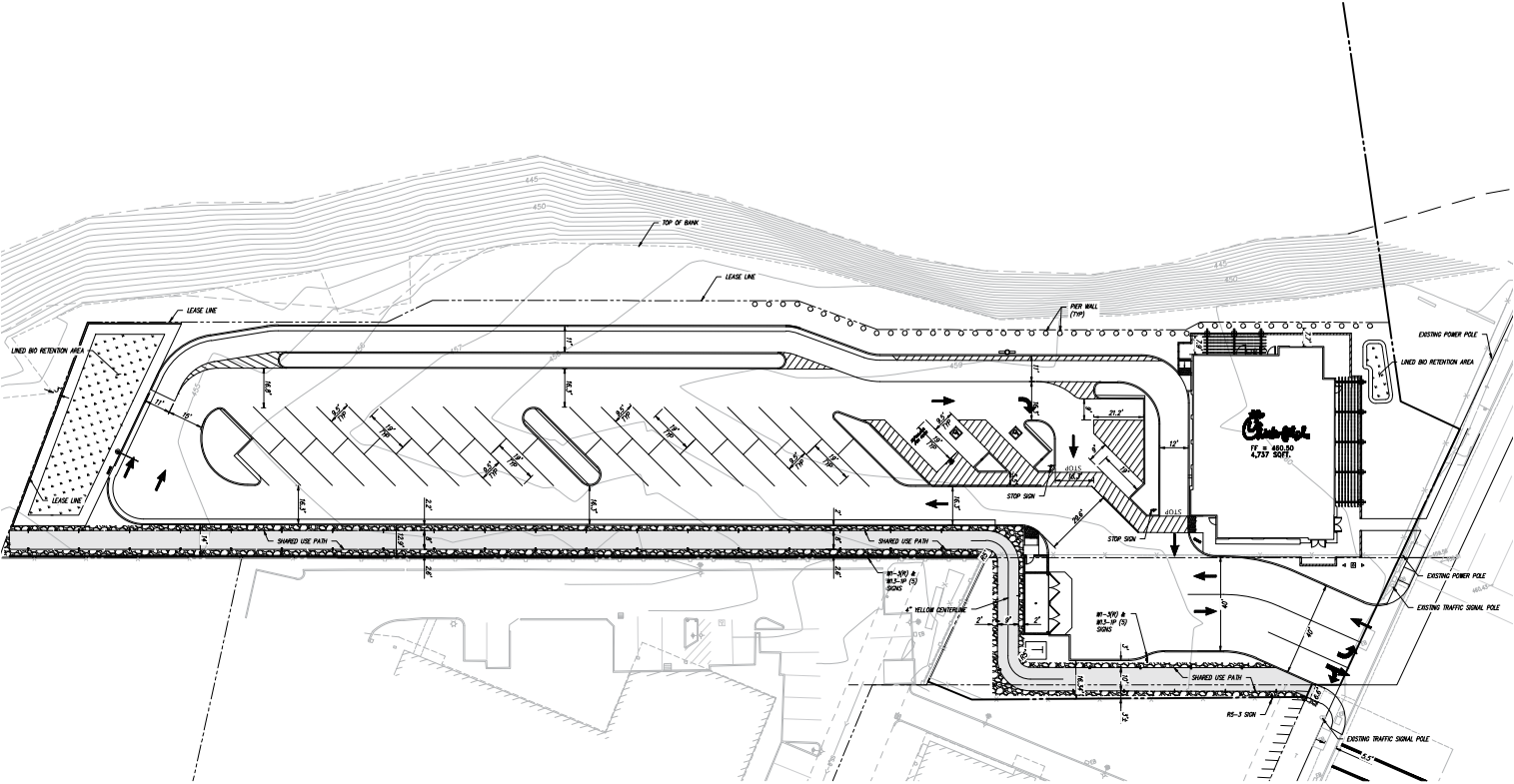


Figure 2  
Site Plan

Most of the project trips to and from the freeway would be diverted linked trips that are already on the freeway. Because the project is expected to generate fewer than five new primary trips on each freeway segment, a freeway analysis was not included.

Traffic conditions at the study intersections were analyzed for both the weekday AM and PM peak hours of adjacent street traffic. The AM peak hour is expected to occur between 7:00 AM and 9:00 AM and the PM peak hour is expected to occur between 4:00 PM and 6:00 PM on a regular weekday. These are the peak commute hours during which most traffic congestion occurs on the roadways.

Traffic conditions were evaluated for the following scenarios:

- Scenario 1: *Existing Conditions.*** Existing conditions were represented by existing peak-hour traffic volumes on the existing roadway network. Existing traffic volumes were obtained from new traffic counts conducted in October 2019.
- Scenario 2: *Background Conditions.*** Background conditions were represented by future traffic volumes on the future roadway network. Background traffic volumes were estimated by adding to existing peak-hour volumes the projected volumes from approved but not yet constructed developments in the study area. A list of approved developments was obtained from the City of Livermore.
- Scenario 3: *Project Conditions.*** Project-generated traffic volumes were added to background traffic volumes to estimate background plus project conditions (also referred to as Project Conditions). Project conditions were evaluated relative to background conditions in order to determine potential project impacts.
- Scenario 4: *Cumulative Conditions.*** Cumulative conditions represent the future conditions with expected growth in the area. Cumulative traffic volumes were estimated based on available year 2040 forecasts from the Alameda County travel demand forecast model.
- Scenario 5: *Cumulative plus Project Conditions.*** Cumulative plus project conditions were estimated by adding to the cumulative traffic volumes the additional traffic estimated to be generated by the proposed project. Cumulative plus project conditions were evaluated relative to cumulative conditions to determine potential project impacts.

## Methodology

This section presents the methods used to determine the traffic conditions for each scenario described above. It includes descriptions of the data requirements, the analysis methodologies, and the applicable level of service standards.

### Data Requirements

The data required for the analysis were obtained from new traffic counts, previous traffic studies, the City of Livermore, and field observations. The following data were collected from these sources:

- Existing traffic volumes
- Existing lane configurations
- Signal timing and phasing
- Previous traffic studies, and
- Year 2040 traffic volumes from the Alameda County travel demand forecast model



## Level of Service Standards and Analysis Methodologies

Traffic conditions at the study intersections were evaluated using level of service (LOS). *Level of Service* is a qualitative description of operating conditions ranging from LOS A, or free-flow conditions with little or no delay, to LOS F, or jammed conditions with excessive delays. The various analysis methods are described below.

### City of Livermore Signalized Intersections

The City of Livermore evaluates level of service at signalized intersections based on the 2000 *Highway Capacity Manual* (HCM) level of service methodology using Synchro software. The 2000 HCM method evaluates signalized intersection operations based on average control delay time for all vehicles at the intersection.

The City of Livermore level of service standard for signalized intersections is mid-level LOS D or better (average vehicle delay of 45 seconds or less), except within the Downtown Area, near freeway interchanges, or designated major east/west streets carrying a high percentage of regional cut-through traffic. The Downtown Area and major east/west streets have no level of service standard, while intersections near freeway interchanges have a level of service standard of LOS E. According to the General Plan, the following study intersections are near freeway interchanges:

- North Livermore Avenue and I-580 Westbound Ramps
- North Livermore Avenue and I-580 Eastbound Ramps
- North Livermore Avenue and Arroyo Plaza
- North Livermore Avenue and Las Positas Road

Thus, these four study intersections have a level of service standard of LOS E. There are no study intersections that are considered within the Downtown Area or a major east/west street with a high percentage of regional cut-through traffic. The intersection of North Livermore Avenue and Portola Avenue is subject to the mid-level LOS D standard. The correlation between average control delay and level of service is shown in Table 1.

**Table 1**  
**Signalized Intersection Level of Service Definitions Based on Control Delay**

Level of Service	Description	Average Control Delay Per Vehicle (sec.)
<b>A</b>	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	Up to 10.0
<b>B</b>	Operations with low delay occurring with good progression and/or short cycle lengths.	10.0 to 20.0
<b>C</b>	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 35.0
<b>D</b>	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
<b>E</b>	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.1 to 80.0
<b>F</b>	Operation with delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.	Greater than 80.0

Source: Transportation Research Board, *2000 Highway Capacity Manual*, (Washington, D.C., 2000).

## Traffic Operation Standards and Significant Impact Criteria

Significance criteria are used to establish what constitutes an impact. Impacts on signalized intersections are based on the significance criteria and level of service standards of the jurisdiction in which the intersection is located. For this analysis, significance criteria for impacts on signalized intersections are based on the City of Livermore level of service standards. As mentioned in the previous section, the City of Livermore level of service standard for signalized intersections is mid-level LOS D or better, except near freeway interchanges where the level of service standard is LOS E.

According to the City of Livermore, a development is said to create a significant adverse impact on traffic conditions at a signalized intersection if for either peak hour, either of the following conditions occurs:

1. The level of service at the intersection degrades from an acceptable level (mid-level LOS D or better and LOS E at intersections near freeway interchanges) under no-project conditions to an unacceptable level (LOS E or F and LOS F at intersections near freeway interchanges) under project conditions, or
2. The level of service at the intersection is an unacceptable level under no-project conditions and the addition of project trips causes the average intersection delay to increase by five or more seconds.

A significant impact is said to be satisfactorily mitigated when measures are implemented that would restore intersection conditions to its level of service standard or to an average intersection delay that is equal or better than no-project conditions.

## Report Organization

The remainder of this report is divided into six chapters. Chapter 2 describes the existing roadway network, transit services, and pedestrian facilities. Chapter 3 describes background conditions with the approved projects in the City of Livermore. Chapter 4 describes the methods used to estimate project traffic and its impact on the background transportation system. Chapter 5 describes cumulative conditions in the year 2040 with and without the project. Chapter 6 discusses the project's effect on VMT and evaluates potential projects impacts on transit, bicycle, and pedestrian facilities, as well as other transportation issues including vehicle queuing. Chapter 7 presents the study conclusions and recommended improvements.

## 2. Existing Conditions

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This chapter describes the existing conditions for transportation facilities in the vicinity of the site, including the roadway network, transit service, pedestrian and bicycle facilities.

### Existing Roadway Network

Regional access to the project site is provided via Interstate 580 (I-580).

**I-580** is an east-west freeway with four mixed-flow lanes and two express lanes in the eastbound direction, and four mixed-flow lanes and one express lane in the westbound direction within the project vicinity. I-580 provides regional access from Marin County and the east bay cities in Alameda County to San Joaquin County, where it merges with Interstate 5 (I-5). Access to the project study area is provided via its interchange with North Livermore Avenue.

Local access to the site is provided on North Livermore Avenue. Other roadways in the study area include Arroyo Plaza, Las Positas Road, Portola Avenue. These roadways are described below.

**North Livermore Avenue** is primarily a four-lane, north-south arterial roadway that begins at Manning Road north of I-580 and continues south past Concannon Boulevard, where it becomes Tesla Road. North Livermore Avenue is located adjacent to the project site and provides access to residential and commercial uses. North Livermore Avenue would provide direct access to the project site via a proposed driveway directly opposite Arroyo Plaza. North Livermore Avenue south of I-580 has been designated as a major street and north of I-580 has been designated as an intercounty route per the City of Livermore General Plan.

**Las Positas Road** is primarily a four-lane, east-west roadway that begins at Greenville Road in the east and continues west to North Livermore Avenue, where it becomes Las Positas Court, which is a two-lane roadway. Las Positas Road is located south of the project site and provides access to commercial and industrial uses. Las Positas Road west of North Livermore Avenue has been designated as a major street per the City of Livermore General Plan.

**Portola Avenue** is primarily a four-lane, east-west roadway that begins at First Street in the east and continues west over I-580 to Collier Canyon Road, where it becomes Canyons Parkway. Portola Avenue is located south of the project site and provides access to residential and commercial uses. Portola Avenue has been designated as a major street per the City of Livermore General Plan.

**Arroyo Plaza** is primarily a two-lane, east-west, roadway that begins at Las Positas Road in the east and circulates west through the Vintage Square Shopping Center to North Livermore Avenue. Arroyo Plaza is located east of the project site and would align with the proposed project driveway at North Livermore Avenue.

## Existing Pedestrian and Bicycle Facilities

Pedestrian facilities consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections. In the project vicinity, sidewalks are provided on both sides of North Livermore Avenue, Arroyo Plaza, Las Positas Road, and Portola Avenue. Crosswalks with pedestrian signal heads and push buttons are provided at all the signalized study intersections except at the eastbound and westbound I-580 ramps. There are no crosswalks at the I-580 ramps and at the southern legs of the North Livermore Avenue intersections at Arroyo Plaza (Project Driveway) and Las Positas Road.

According to the Alameda CTC Bicycle Plan and the City of Livermore Active Transportation Plan, there are several designated bikeways within the vicinity of the project site. Bicycle facilities in the City of Livermore can be categorized into different classifications: Class I multi-use trail, Class II bike lane, Class III bike route and Class III bike boulevard. Class I multi-use trails have a separate right of way exclusive for bicycles and pedestrians. Class II bike lanes are dedicated pavement within a roadway with striping and signage separating bicyclists from motorists. Class III bike routes are roadways where the travel lane is wide enough for both bicycles and vehicles and have low traffic volume. Class III bike boulevards are bike routes with additional modifications intended to provide cyclists with a higher level of comfort and safety. Designated bicycle facilities are provided along segments of the following roadways in the study area:

- The existing Class I Arroyo Las Positas Trail begins at the intersection of Campus Hill Drive/Isabel Avenue and Portola Avenue to the west and ends at Northfront Road to the east. There are a few gaps between the existing portions of the trail. In the project vicinity, the existing trail starts from the rear of the apartment complex on Paseo Laguna Seco and continues east on the south side of the Arroyo where it terminates about 1,000 feet west of North Livermore Avenue. Another disjoint segment extends westward from Las Colinas Road approximately 0.6 miles to the east end of the Arroyo Plaza retail center. Planned improvements include a gap closure between the Portola Avenue/I-580 overcrossing and the existing portion of the trail at the rear of the apartment complex on Paseo Laguna Seco. Another gap closure is planned to extend the existing trail past North Livermore Avenue to connect to the other portion of the existing trail near the Arroyo Plaza retail center.
- North Livermore Avenue has Class II bicycle lanes in both directions between Las Positas Road and Portola Avenue.
- Las Positas Road has Class II bicycle lanes in both directions between Greenville Road and North Livermore Avenue.
- Portola Avenue has Class II bicycle lanes in both directions for its entire length.

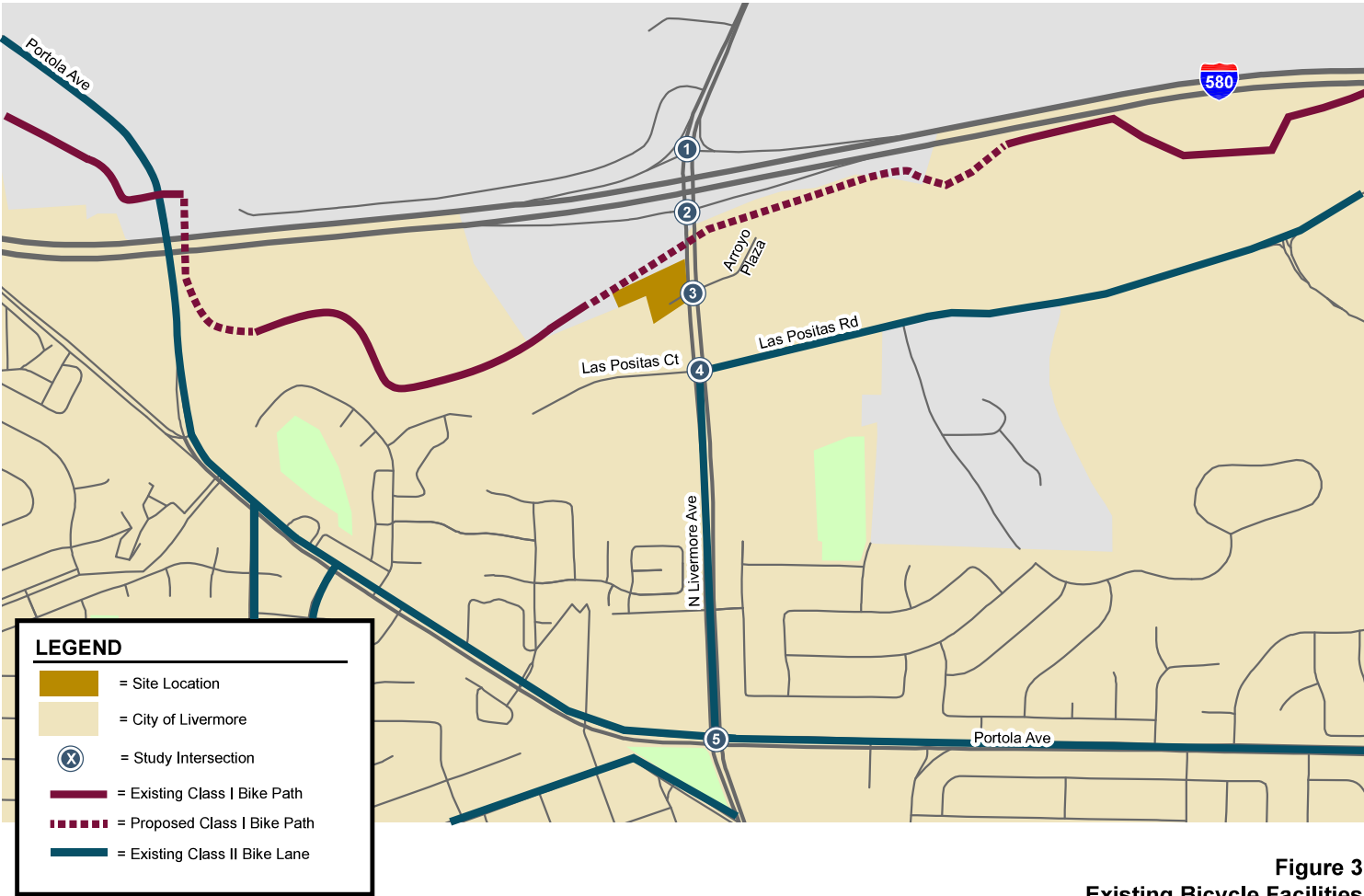
The existing bicycle facilities within the study area are shown on Figure 3.

## Existing Transit Service

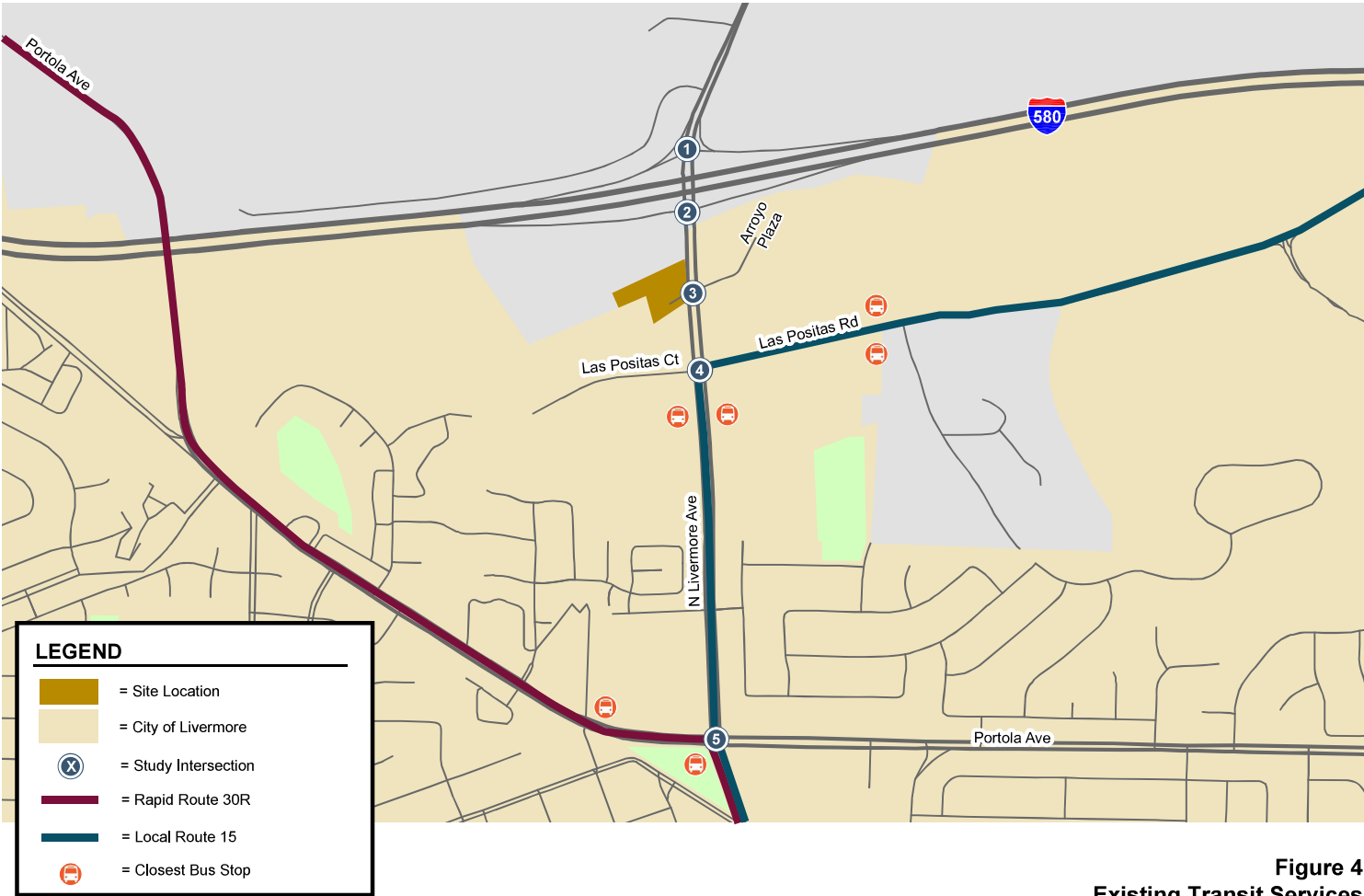
Existing transit service to the study area is provided by the Livermore-Amador Valley Transit Authority (LAVTA). Bus stops within the vicinity of the project site are located along North Livermore Avenue, Las Positas Road, and Portola Avenue. LAVTA bus lines with stops within the study area include Route 15 (Local) and Route 30R (Rapid). Local Route 15 provides service between the Livermore Transit Center

and Springtown Boulevard via North Livermore Avenue and Las Positas Road, with 30-minute headways during the day on weekdays and 60-minute headways on weekday evenings and weekends. The bus stops closest to the project site are located along North Livermore Avenue, 500 feet south of the North Livermore Avenue/Las Positas Road intersection, as well as along Las Positas Road at the Las Positas Road/Arroyo Plaza intersection. The Rapid Route 30R provides service every 15-minutes during the day on weekdays to the following locations: East and West Dublin BART, Dublin Blvd, Las Positas College, Portola Ave, Livermore Transit Center/ACE Station, East Ave and the Lawrence Livermore National Laboratory. 30R operates with 30- to 60-minute headways on weekday evenings and hourly on weekends. The bus stops closest to the project site are located on the west and south legs of the North Livermore Avenue and Portola Avenue intersection.

The LAVTA bus services and the closest bus stops in the vicinity of the project site are shown on Figure 4.



**Figure 3**  
**Existing Bicycle Facilities**



**Figure 4**  
**Existing Transit Services**



## Existing Intersection Lane Configurations

The existing lane configurations at the study intersections were determined by observations in the field and are shown on Figure 5.

## Existing Traffic Volumes

Existing traffic volumes were obtained from peak-hour counts collected on October 2, 2019. The existing peak-hour intersection volumes are shown on Figure 6. Intersection turning-movement counts conducted for this analysis are presented in Appendix A.

## Existing Intersection Levels of Service

Intersection levels of service were evaluated against the City of Livermore standards. The results of the intersection level of service analysis under existing conditions are summarized in Table 2.

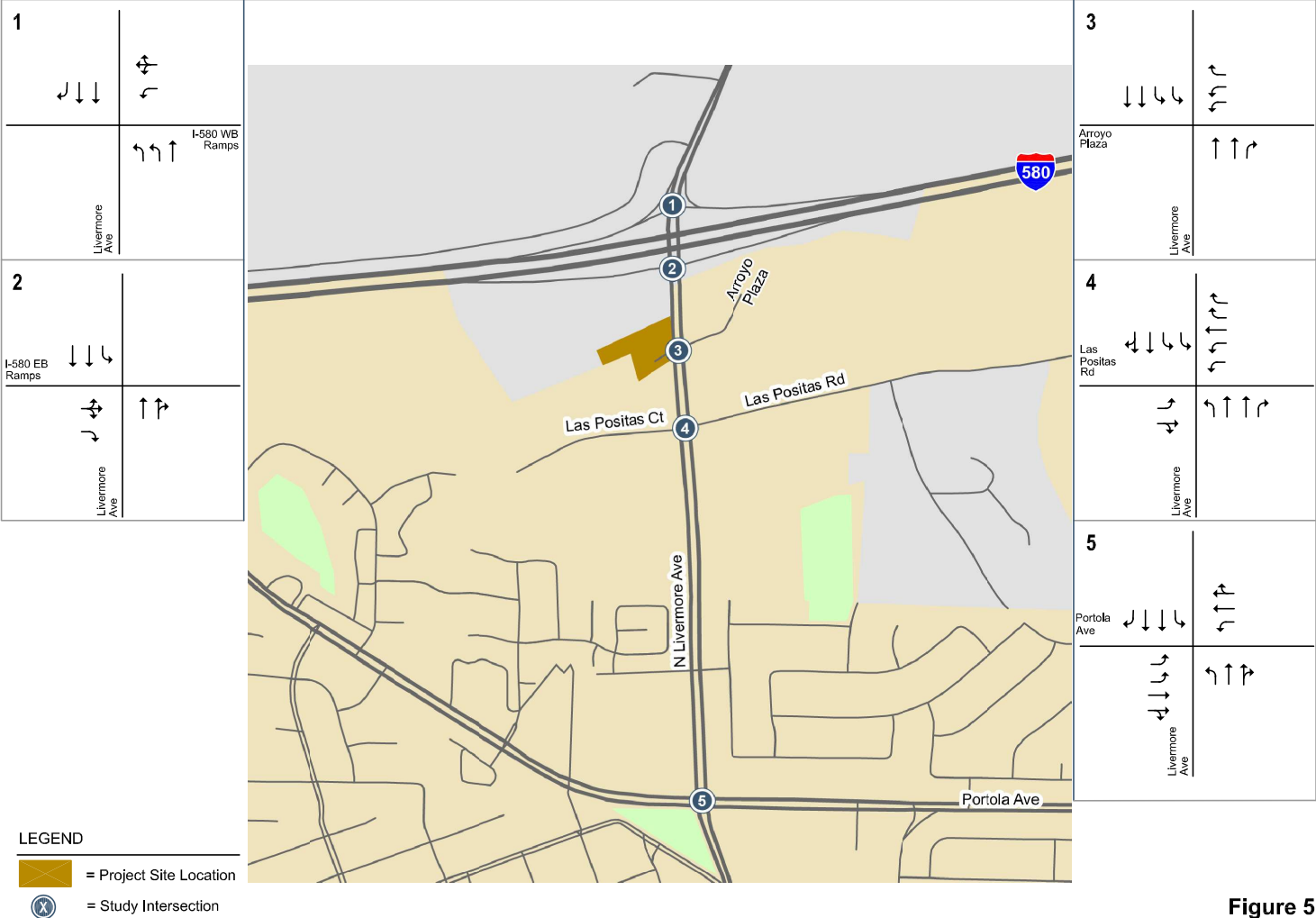
The results of the analysis show that all five signalized study intersections currently operate at mid-level LOS D or better during the AM and PM peak hours of traffic. Level of service calculation sheets are included in Appendix C.

**Table 2**  
**Existing Intersection Levels of Service**

#	Intersection	LOS Standard <sup>1</sup>	Peak Hour	Count Date	Existing Conditions	
					Delay (sec)	LOS
1	N. Livermore Avenue & I-580 Westbound Ramps	LOS E	AM	10-2-2019	17.6	B
			PM	10-2-2019	16.0	B
2	N. Livermore Avenue & I-580 Eastbound Ramps	LOS E	AM	10-2-2019	24.4	C
			PM	10-2-2019	21.0	C
3	N. Livermore Avenue & Arroyo Plaza	LOS E	AM	10-2-2019	6.5	A
			PM	10-2-2019	8.5	A
4	N. Livermore Avenue & Las Positas Road	LOS E	AM	10-2-2019	26.1	C
			PM	10-2-2019	35.4	D
5	N. Livermore Avenue & Portola Avenue	mid-level	AM	10-2-2019	36.2	D
		LOS D	PM	10-2-2019	36.9	D

**Notes:**  
 1 The City of Livermore LOS standard for signalized intersections is mid-level LOS D (average delay of 45 seconds or less) in most locations.  
 Study intersections 1-4 are near freeway interchanges and are therefore subject to an LOS E standard (average delay of 80 seconds or less).  
**BOLD** indicates a substandard level of service

Chick-Fil-A Restaurant, Livermore



**Figure 5**  
**Existing Lane Configurations**

Chick-Fil-A Restaurant, Livermore

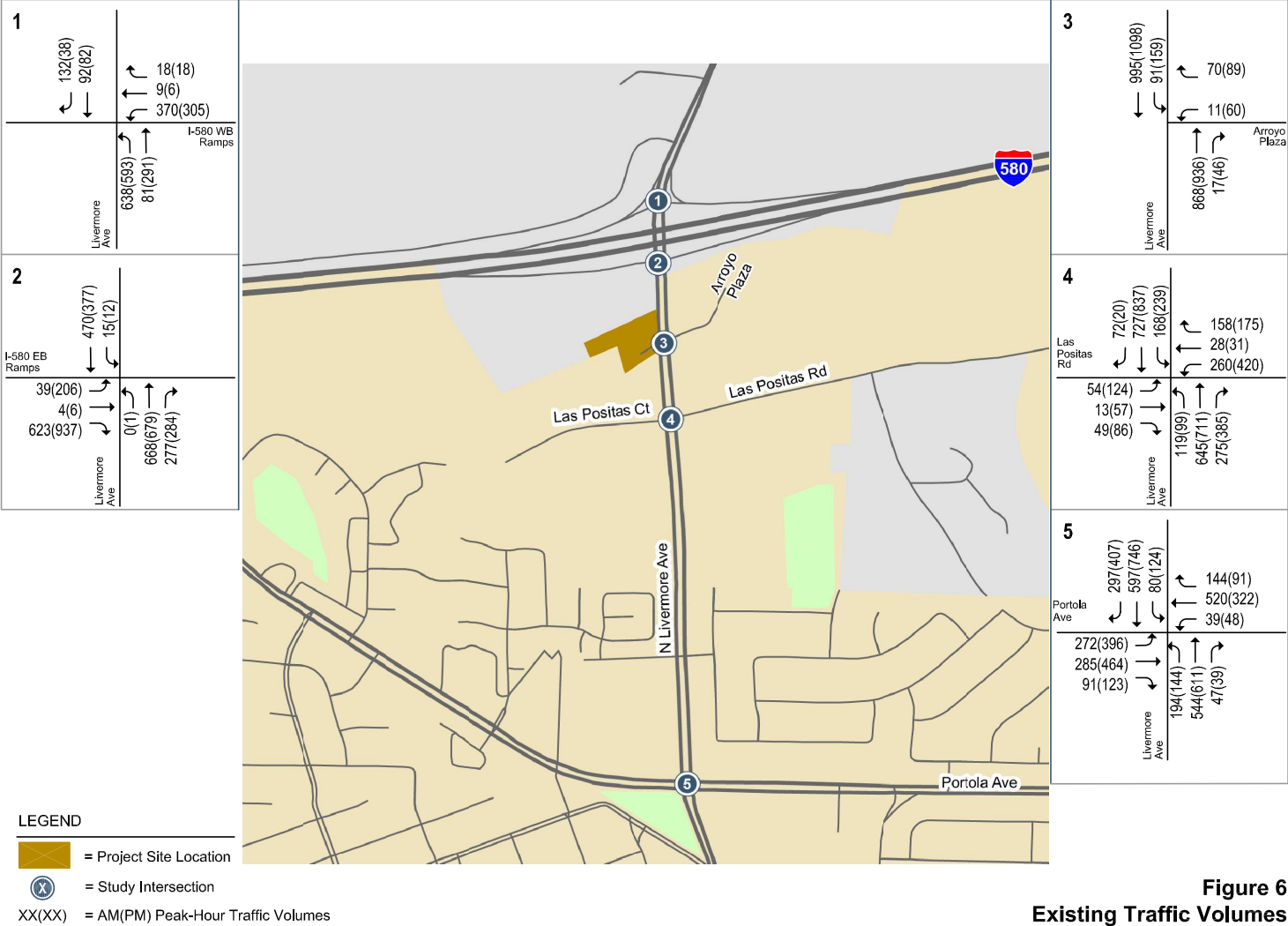


Figure 6  
Existing Traffic Volumes

## Observed Existing Traffic Conditions

Traffic conditions in the field were observed in order to identify existing operational deficiencies and to confirm the accuracy of calculated intersection levels of service. The purpose of this effort was (1) to identify any existing traffic problems that may not be directly related to level of service, and (2) to identify any locations where the level of service analysis does not accurately reflect existing traffic conditions.

Field observations showed that operational issues currently occur along North Livermore Avenue at the intersections of Arroyo Plaza, Las Positas Road, and Portola Avenue that may not be reflected in the intersection level of service calculations.

### North Livermore Avenue and Arroyo Plaza

During the PM peak hour, congestion on southbound North Livermore Avenue occasionally spills back from the downstream intersection at Las Positas Road through the intersection at Arroyo Plaza, causing minor delays for the southbound through movement. However, southbound vehicles are able to clear the intersection in one signal cycle.

### North Livermore Avenue and Las Positas Road

During the PM peak hour, as previously mentioned, there are long vehicle queues on southbound North Livermore Avenue. The long vehicle queues occasionally extend from Las Positas Road to the upstream intersection at Arroyo Plaza. However, the southbound through vehicles are able to clear the intersection in one signal cycle. The southbound congestion makes it difficult for vehicles to access the left-turn storage lane. Thus, left-turn vehicles occasionally wait through one cycle before they can access the left-turn pocket and sit through a second signal cycle to clear the intersection. Occasionally, there are also long vehicle queues for the eastbound left-turn movement. The vehicle queues extend beyond the storage pocket and into the through lane. Eastbound left-turn vehicles are able to clear the intersection in one signal cycle.

### North Livermore Avenue and Portola Avenue

During the PM peak hour, southbound congestion on North Livermore Avenue extends beyond the Portola Village driveway. Southbound through vehicles are able to clear the intersection in one signal cycle. The southbound congestion makes it difficult for vehicles exiting the Portola Village shopping center to cross three lanes of southbound traffic to access the left-turn lane leading to eastbound Portola Avenue.

## 3. Background Conditions

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This chapter presents a summary of the traffic conditions that would occur under background conditions, including any changes to the roadway network. Background conditions are defined as conditions just prior to completion of the proposed development. Traffic volumes for background conditions comprise volumes from existing traffic counts plus traffic generated by other approved developments in the vicinity of the site.

### Roadway Network and Traffic Volumes

The roadway network under background conditions is assumed to be the same as under existing conditions.

Background traffic volumes for the study intersections were estimated by adding to existing traffic volumes the trips generated by nearby approved developments that have not yet been constructed or occupied, including the 1934 First Street mixed use project located in downtown Livermore, the Chestnut Square residential project located at the northern edge of Livermore's Downtown Specific Plan area, and the Auburn Grove residential development located on the south side of First Street between Portola Avenue and Scott Street. Approved project trips and/or approved project information was obtained from the City of Livermore. Figure 7 shows the intersection turning-movement volumes under background conditions.

### Intersection Level of Service Analysis

The results of the level of service analysis under background conditions are summarized in Table 3. The results show that, when measured against the City of Livermore level of service standards, all study intersections are expected to operate at an acceptable mid-level LOS D or better during the AM and PM peak hours of traffic (LOS E or better for intersections near a freeway interchange). Level of service calculation sheets are included in Appendix C.

It should be noted that, at some intersections, the average delay is shown to be decreased slightly with the addition of traffic generated by approved developments. This occurs because the intersection delay is a weighted average of all intersection movements. When traffic is added to movements with delays lower than the average intersection delay, the average delay for the entire intersection can decrease.

Chick-Fil-A Restaurant, Livermore

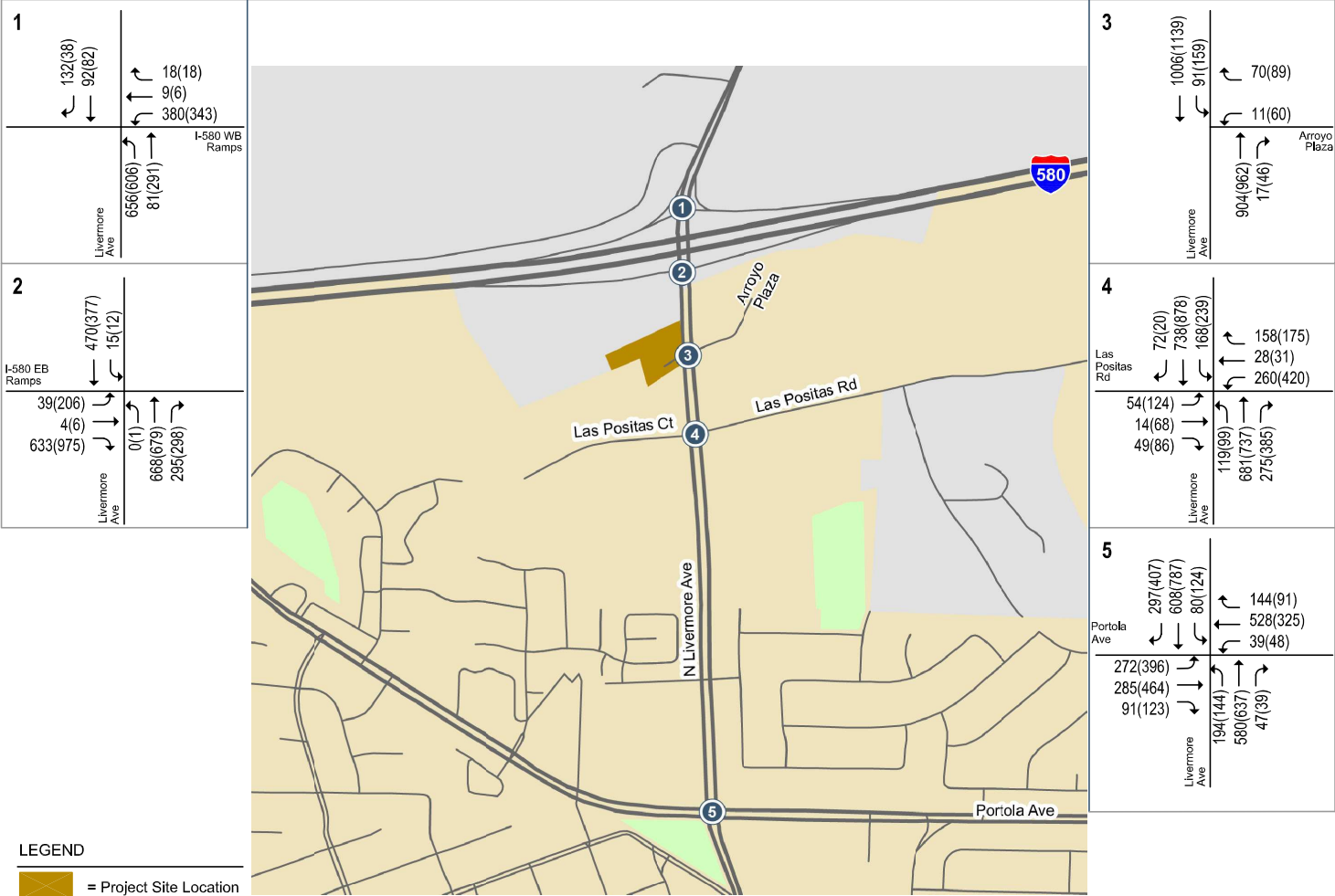


Figure 7  
Background Traffic Volumes



**Table 3**  
**Background Level of Service Summary**

#	Intersection	LOS Standard <sup>1</sup>	Peak Hour	Existing Conditions		Background Conditions	
				Delay (sec)	LOS	Delay (sec)	LOS
1	N. Livermore Avenue & I-580 Westbound Ramps	LOS E	AM	17.6	B	17.8	B
			PM	16.0	B	16.6	B
2	N. Livermore Avenue & I-580 Eastbound Ramps	LOS E	AM	24.4	C	24.3	C
			PM	21.0	C	21.8	C
3	N. Livermore Avenue & Arroyo Plaza	LOS E	AM	6.5	A	6.5	A
			PM	8.5	A	8.4	A
4	N. Livermore Avenue & Las Positas Road	LOS E	AM	26.1	C	26.0	C
			PM	35.4	D	35.9	D
5	N. Livermore Avenue & Portola Avenue	mid-level	AM	36.2	D	36.3	D
		LOS D	PM	36.9	D	37.0	D

**Notes:**

1 The City of Livermore LOS standard for signalized intersections is mid-level LOS D (average delay of 45 seconds or less) in most locations.

Study intersections 1-4 are near freeway interchanges and are therefore subject to an LOS E standard (average delay of 80 seconds or less).

**BOLD** indicates a substandard level of service

## 4. Project Conditions

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This chapter describes traffic conditions with the project. It begins with a description of the transportation system under project conditions and the method by which project traffic is estimated. A summary of levels of service under project traffic conditions is presented in this chapter. Project conditions are represented by background traffic conditions with the addition of traffic generated by the project.

### Transportation Network under Project Conditions

The project proposes a new single full-access driveway that would form the fourth (west) leg of the existing North Livermore Avenue/Arroyo Plaza signalized intersection. The project also proposes to add a left-turn pocket on northbound North Livermore Avenue at the Arroyo Plaza intersection leading into the project site. It is assumed in this analysis that the remaining transportation network under project conditions would be the same as the background transportation network.

### Project Trip Estimates

The magnitude of traffic produced by a new development and the locations where that traffic would appear were estimated using a three-step process: (1) trip generation, (2) trip distribution, and (3) trip assignment. In determining project trip generation, the magnitude of traffic traveling to and from the project was estimated for the AM and PM peak hours. As part of the project trip distribution, the directions to and from which the project trips would travel were estimated. In the project trip assignment, the project trips were assigned to specific streets and intersections. These procedures are described below.

#### Trip Generation

Through empirical research, data have been collected that indicate the amount of traffic that can be expected to be generated by common land uses. The standard trip generation rates can be applied to help predict the future traffic increases that would result from a new development. The standard trip generation rates are published in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*.

Hexagon previously conducted a trip generation count at a Chick-fil A restaurant at 2280 Monterey Highway, in San Jose (see Appendix D). The count showed that the Chick-fil A restaurant generated trips at a rate that is lower than the rates published in the ITE *Trip Generation Manual, 10th Edition*. Thus, to be conservative, project trips were estimated based on the published ITE trip generation rates rather than the Chick-fil A observed trip rates. Based



on ITE average trip generation rates for a fast-food restaurant with a drive-through window (Land Use 934), the proposed development would generate a total of 2,182 daily trips, with 186 trips (95 in and 91 out) occurring during the AM peak hour and 151 trips (79 in and 72 out) occurring during the PM peak hour (see Table 4).

A pass-by trip reduction of 50 percent, as well as a diverted linked trip reduction of 25 percent was applied to the trip generation. Trip reduction percentages were obtained from the ITE *Trip Generation Handbook, Third Edition*. Pass-by trips are trips that would already drive by the site on North Livermore Avenue (and are therefore already counted in the existing traffic) but would turn into the site while passing by. Pass-by trips result in a reduction in through traffic on North Livermore Avenue and an equivalent increase in trips turning in and out of the project driveway. Diverted linked trips are trips that would be diverted from other study area roadways (such as I-580) to the project site. Although diverted linked trips would add traffic to the segment of North Livermore Avenue between the project site and I-580, the trips would not be new to the study area. Justification for applying the pass-by trip reduction and the diverted linked trip reduction is founded on the observation that such traffic is not primarily generated by the proposed development but is already part of the ambient traffic levels.

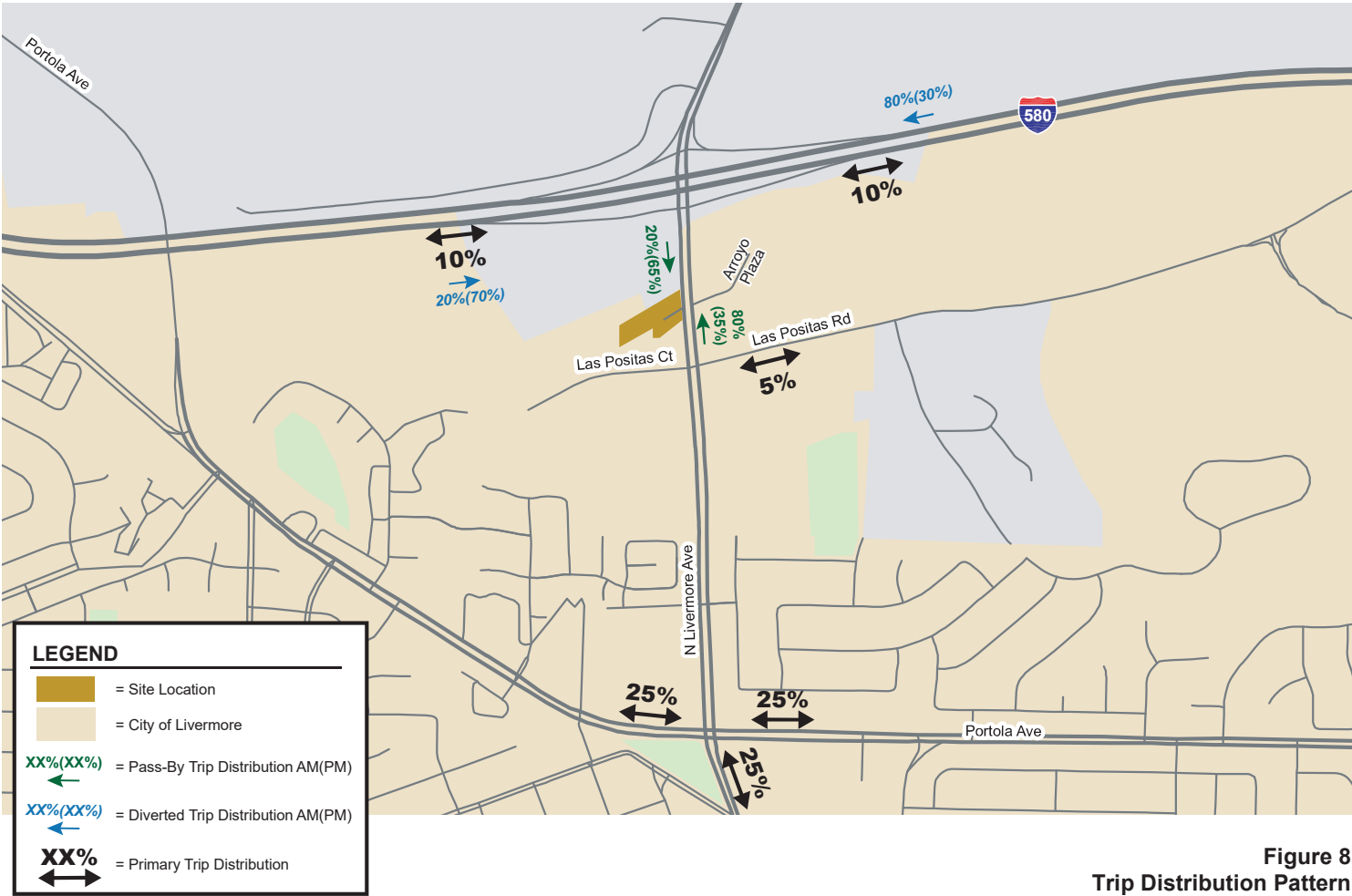
After applying the pass-by and diverted linked trip reductions, the project would generate 545 new primary trips per day, with 46 new primary trips occurring during the AM peak hour and 37 new primary trips occurring during the PM peak hour. The project trip generation estimates are presented in Table 4.

**Table 4**  
**Project Trip Generation Estimates**

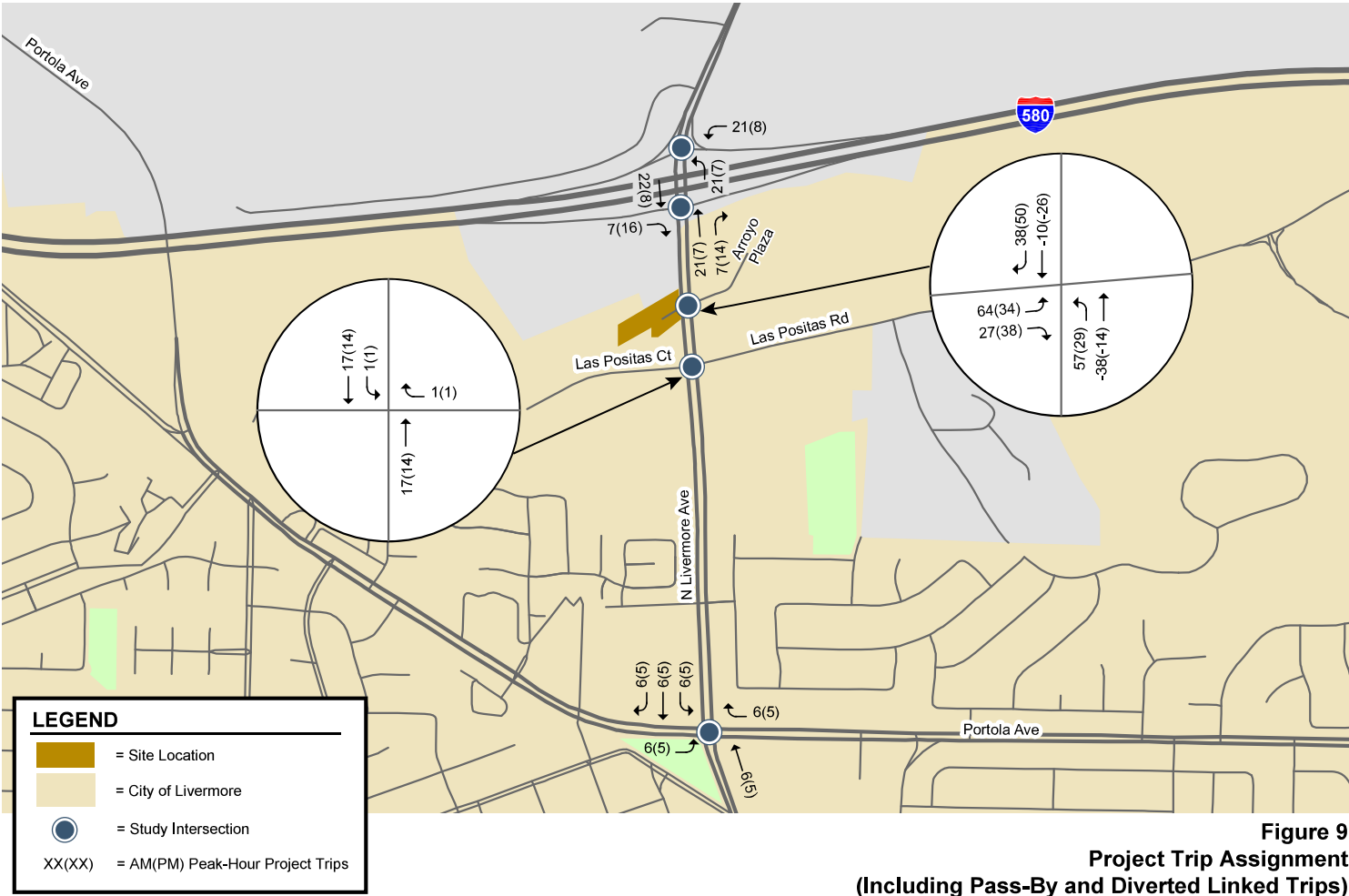
Project Trip Generation Estimates											
Land Use	Size	Daily		AM Peak Hour				PM Peak Hour			
		Rate	Trips	Rate	In	Out	Total	Rate	In	Out	Total
Proposed Uses											
Fast-Food Restaurant with Drive-Through Window <sup>1</sup>	4.63 ksf	471	2,182	40.19	95	91	186	32.67	79	72	151
Pass By Trips (50%) <sup>2</sup>			(1,091)		(48)	(46)	(93)		(40)	(36)	(76)
Diverted Linked Trips (25%) <sup>2</sup>			(546)		(24)	(23)	(47)		(20)	(18)	(38)
New Primary Trips:			545		23	22	46		19	18	37
Notes:											
KSF = 1,000 square feet gross leasable area.											
<sup>1</sup> Fast Food Restaurant with Drive-Through Window (Land Use 934), average rates from the ITE <i>Trip Generation Manual, 10th Edition, 2017</i> .											
<sup>2</sup> Pass-by and diverted trip reduction percentages based on data for a fast food restaurant with drive-through contained in the ITE <i>Trip Generation Handbook, 3rd Edition, 2017</i> .											

## Trip Distribution and Assignment

The trip distribution pattern for the project was estimated based on existing travel patterns on the surrounding roadway network and the locations of complementary land uses. The trip distribution pattern for the project is shown on Figure 8. The peak-hour trips generated by the project were assigned to the roadway network in accordance with the project trip distribution pattern. Figure 9 shows the assignment of project trips at each study intersection including pass-by and diverted linked trips. The negative trips shown for some movements reflect the pass-by trip reductions from the existing traffic due to the project.



**Figure 8**  
**Trip Distribution Pattern**



**Figure 9**  
**Project Trip Assignment**  
**(Including Pass-By and Diverted Linked Trips)**

## Project Condition Traffic Volumes

Project trips, as represented in the above project trip assignment, were added to background traffic volumes to obtain project condition traffic volumes. The project condition traffic volumes at the study intersections are shown on Figure 10.

## Project Condition Intersection Analysis

The results of the level of service analysis under project conditions are summarized in Table 5. The results show that, when measured against City of Livermore standards, the five signalized study intersections would operate at mid-level LOS D or better during both the AM and PM peak hours of traffic. The addition of project trips would not cause any study intersections to degrade to an unacceptable level. Level of service calculation sheets are included in Appendix C.

**Table 5**  
**Project Condition Intersection Levels of Service**

#	Intersection	LOS Standard <sup>1</sup>	Peak Hour	Background Conditions		Background plus Project Conditions		
				Delay (sec)	LOS	Delay (sec)	LOS	Incr. in Delay
1	N. Livermore Avenue & I-580 Westbound Ramps	LOS E	AM	17.8	B	18.8	B	1.0
			PM	16.6	B	16.7	B	0.1
2	N. Livermore Avenue & I-580 Eastbound Ramps	LOS E	AM	24.3	C	25.2	C	0.9
			PM	21.8	C	24.1	C	2.3
3	N. Livermore Avenue & Arroyo Plaza	LOS E	AM	6.5	A	12.4	B	5.9
			PM	8.4	A	12.4	B	4.0
4	N. Livermore Avenue & Las Positas Road	LOS E	AM	26.0	C	26.0	C	0.0
			PM	35.9	D	35.9	D	0.0
5	N. Livermore Avenue & Portola Avenue	mid-level	AM	36.3	D	36.5	D	0.2
		LOS D	PM	37.0	D	37.3	D	0.3

**Notes:**  
 1 The City of Livermore LOS standard for signalized intersections is mid-level LOS D (average delay of 45 seconds or less) in most locations.  
 Study intersections 1-4 are near freeway interchanges and are therefore subject to an LOS E standard (average delay of 80 seconds or less).  
**BOLD** indicates a substandard level of service

Chick-Fil-A Restaurant, Livermore

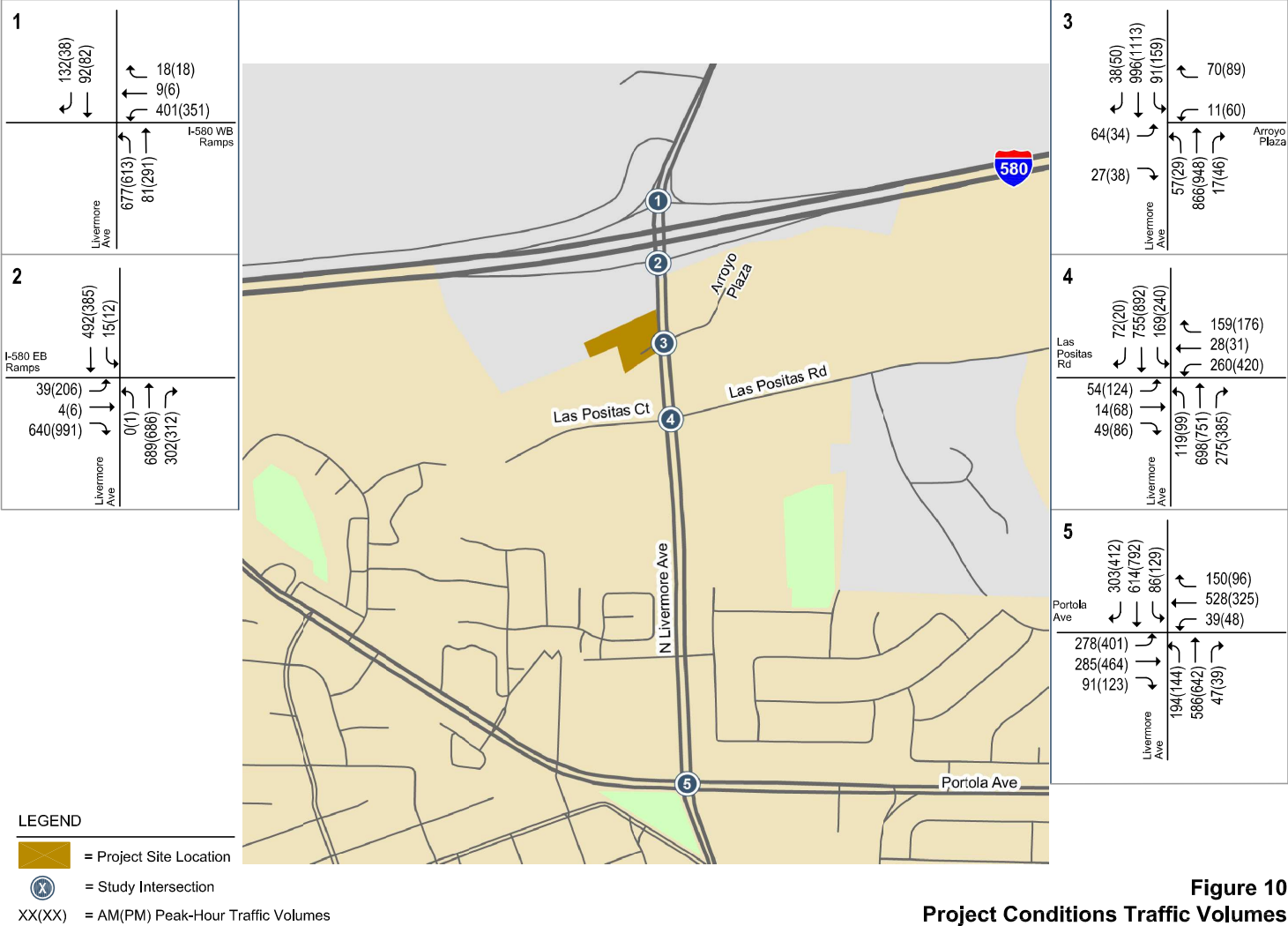


Figure 10  
Project Conditions Traffic Volumes



## 5. Cumulative Conditions

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This chapter presents a summary of the traffic conditions that would occur under cumulative conditions with the proposed project. Cumulative conditions represent future traffic conditions with expected growth in the area. The expected future traffic growth conditions are estimated based on Alameda County's travel demand forecast model. Cumulative conditions reflect a horizon year of 2040.

### Roadway Network and Traffic Volumes

The intersection lane configurations under cumulative conditions were assumed to be the same as described under background conditions.

Cumulative conditions for the study intersections were estimated based on year 2040 traffic volumes from the County's travel demand forecast model. Project trips were then added to the cumulative traffic estimates to estimate traffic volumes under cumulative plus project conditions. Figures 11 and 12 show the intersection turning-movement volumes under cumulative conditions with and without the project.

### Intersection Levels of Service Analysis

The results of the level of service analysis under cumulative conditions are summarized in Table 6. The results show that, when measured against the City of Livermore level of service standards, all but one study intersection are expected to operate at acceptable levels both with and without the proposed project. Under cumulative conditions, the intersection of North Livermore Avenue and Portola Road would exceed mid-level LOS D (45 seconds average delay) during the AM peak hour both with and without the additional trips generated by the proposed project. However, based on the significance criteria presented in chapter 1, the project is expected to have an insignificant impact at the intersection. Level of service calculation sheets are included in Appendix C.

One study intersection, N. Livermore Avenue and Arroyo Plaza, is shown to have a lower average delay under cumulative conditions than under background conditions even though cumulative traffic volumes are projected to be substantially greater than background traffic volumes. This counterintuitive result is due to the fact that the reported intersection delay is a weighted average of all movements at the intersection. Under cumulative conditions, traffic is added to movements that have a lower than average delay (i.e. the northbound and southbound through movements), which causes a reduction in the overall average intersection delay.

Chick-Fil-A Restaurant, Livermore

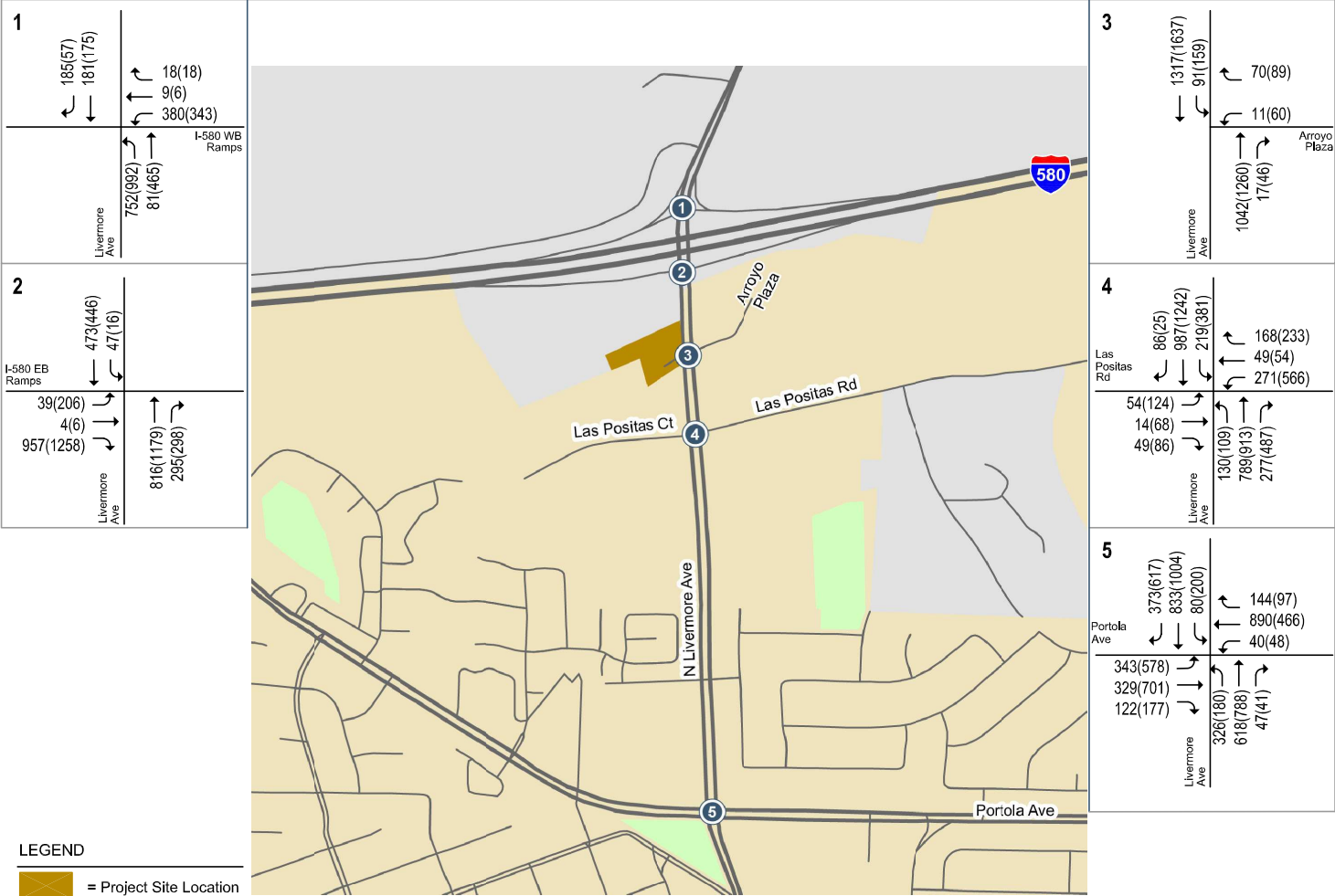
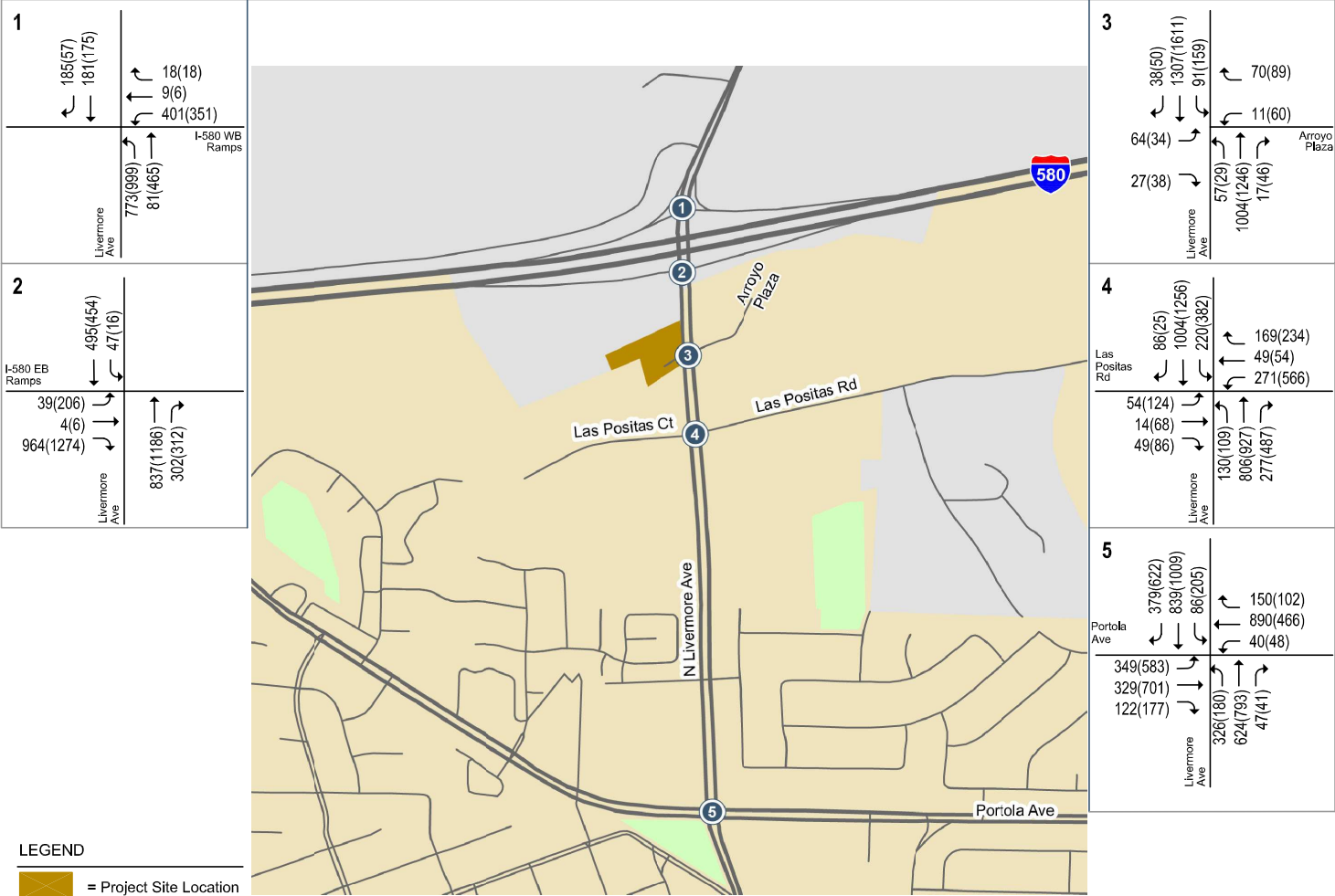


Figure 11  
Cumulative Traffic Volumes



Chick-Fil-A Restaurant, Livermore



LEGEND

= Project Site Location

= Study Intersection

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 12  
Cumulative Plus Project Traffic Volumes



**Table 6**  
**Cumulative Level of Service Summary**

#	Intersection	LOS Standard <sup>1</sup>	Peak Hour	Cumulative Conditions		Cumulative Plus Project Conditions		
				Delay (sec)	LOS	Delay (sec)	LOS	
1	N. Livermore Avenue & I-580 Westbound Ramps	LOS E	AM	18.2	B	17.9	B	-0.3
			PM	16.5	B	16.6	B	0.1
2	N. Livermore Avenue & I-580 Eastbound Ramps	LOS E	AM	27.2	C	28.3	C	1.1
			PM	46.6	D	50.4	D	3.8
3	N. Livermore Avenue & Arroyo Plaza	LOS E	AM	5.7	A	12.7	B	7.0
			PM	7.6	A	13.8	B	6.2
4	N. Livermore Avenue & Las Positas Road	LOS E	AM	25.4	C	25.3	C	-0.1
			PM	38.9	D	39.1	D	0.2
5	N. Livermore Avenue & Portola Avenue	mid-level	AM	<b>51.8</b>	<b>D</b>	<b>52.7</b>	<b>D</b>	<b>0.9</b>
		LOS D	PM	44.5	D	44.7	D	0.2

Notes:  
 1 The City of Livermore LOS standard for signalized intersections is mid-level LOS D (average delay of 45 seconds or less) in most locations.  
 Study intersections 1-4 are near freeway interchanges and are therefore subject to an LOS E standard (average delay of 80 seconds or less).  
 BOLD indicates a substandard level of service

## 6. Other Transportation Issues

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This chapter presents other transportation issues associated with the project. These include an analysis of:

- Vehicle miles travelled
- Site access and circulation
- Parking
- Potential impacts to transit, bicycle, and pedestrian facilities
- Roadway Segments
- Vehicle Queuing

### Vehicle Miles Travelled

Senate Bill (SB) 743, signed into law in 2013, requires CEQA lead agencies to shift from using traditional LOS standards and automobile delay to determine significant traffic impacts. In December 2018, the California Natural Resources Agency certified and adopted the CEQA Guidelines update package implementing Senate Bill 743. The new guidelines require the use of vehicle miles travelled (VMT) as the metric for evaluating the significant traffic impacts to promote greenhouse gas emissions reductions, multimodal transportation networks and diverse land uses. Cities have until July 2020 to adopt the new CEQA procedures based on VMT. Since the City of Livermore has not yet adopted a policy or established any thresholds based on VMT, the potential impacts of this project were determined based upon the City of Livermore's adopted LOS-based methodology. Nevertheless, according to the new guidelines, local-serving retail developments such as the proposed project are presumed to have a less than significant impact on VMT since they generally result in shorter trip lengths.

### Site Access and On-Site Circulation

Site access and on-site circulation were evaluated using commonly accepted traffic engineering principles. This review is based on a project site plan prepared by Kier + Wright Engineers dated April 21, 2020 (see Figure 2).

### Project Driveway Operations

Vehicular access to the project site would be provided via one full-access driveway that would form the fourth leg at the intersection of North Livermore Avenue and Arroyo Plaza. The full-access driveway would be near the southeastern edge of the project site and would provide access to the surface parking spaces and drive-through entrance. The driveway would have one inbound lane and two outbound lanes (a left-turn lane and a shared through/right-turn lane) with a width of 40 feet (one 16-foot inbound lane and two 12-foot outbound lanes) for a distance of approximately 50 feet. Beyond that distance, the driveway then would be striped with two lanes, one inbound lane of approximately 16 feet

and one outbound lane of approximately 24 feet. The driveway width would meet the City's minimum requirement of 24 feet for a two-way driveway and will be able to accommodate vehicle turns to and from the site.

The project driveway would operate as a fourth leg of the North Livermore Avenue/Arroyo Plaza intersection. An analysis of queues for vehicles entering and exiting the project driveway is presented below. Overall, the project driveway intersection would operate at LOS B during the AM peak hour and LOS A in the PM peak hour. The delays for traffic exiting the project driveway would be greater (LOS D in the AM peak hour and LOS C in the PM peak hour) because North Livermore Avenue has heavier traffic volumes and thus would receive more green time.

### **Sight Distance at the Project Driveway**

There are no existing trees or visual obstructions along the project frontage to obscure sight distance at the project driveway. There are also no curves in the roadway along the project frontage on North Livermore Avenue. Clear sight distance triangles should be provided at the project driveway to optimize sight distance. Any landscaping and signage should be located in such a way to ensure an unobstructed view for drivers exiting the site.

### **On-Site Circulation**

The on-site circulation was reviewed in accordance with the City of Livermore Development Code and generally accepted traffic engineering standards. Generally, the proposed plan would provide vehicle traffic with adequate connectivity through the parking areas. Vehicles traveling within the project site would circulate in a clockwise manner. The project would provide angled parking adjacent to approximately 16 foot drive aisles limited to one-way traffic flow. The drive-through lane along the north side of the project site is approximately 11 feet wide. The drive aisle widths would meet the City's standards and provide sufficient room for vehicles to back out of the parking stalls. Standard size parking stalls (9'-5" wide by 19' long) are proposed and would meet the standards set forth by the City.

### **Drive-Through Analysis**

The City of Livermore Development Code does not specify requirements for the restaurant drive-through lane. According to the project site plan, the proposed drive-through would be located along the northern edge of the project site (see Figure 2). The proposed drive-through is comprised of a single lane with space for 18 vehicles in total between the drive-through entrance and exit assuming an average spacing of 25 feet per vehicle. Hexagon has previously observed vehicle queues during the peak lunch and dinner hours on a typical weekday and Saturday at two other Chick-fil-A restaurants in San Jose and Fremont. At both locations, the maximum queue contained 14 vehicles. Thus, the proposed drive-through stacking space is expected to be sufficient for all time periods. Although the drive-through queue is not expected to overflow the storage space provided, there is ample space on site to accommodate any excess drive-through queue before reaching North Livermore Avenue.

## **Parking**

The parking analysis for the proposed Chick-fil-A restaurant is based on the City of Livermore's zoning code requirements.

### **Vehicle Parking**

The City of Livermore Development Code (Section 4.04.020) states that restaurant developments are required to provide one space per three seats. The Municipal Code, Section 4.04.070, also specifies that the compact-size dimensions may be used for up to thirty percent of the required parking spaces in all developments. Based on these standards, the proposed project (102 seats indoor and 24 outdoor)

would be required to provide 42 on-site parking spaces with at least 29 standard spaces. The site plan dated April 21, 2020 proposes a total of 42 on-site parking spaces. The entire site will comprise standard size spaces. Therefore, the proposed parking supply would meet the minimum parking requirement and complies with the maximum 30 percent standard for compact spaces set forth by the City's code.

### **Bicycle Parking**

The bicycle parking spaces were evaluated based on the requirements established in the City of Livermore zoning regulations (Section 4.04.030), which require the project to provide a minimum of four bicycle stalls or a number equal to 20 percent of the required off-street parking, whichever is greater. Based on a requirement of 42 parking spaces, the proposed project would be required to provide 8 bike parking spaces. The project will provide ten bicycle parking spaces to be located on the sidewalk at the northeast corner of the proposed restaurant within 50 feet of a public entrance. Therefore, the supply and location of bicycle parking complies with City standards.

## **Potential Impacts on Pedestrians, Bicycles, and Transit**

### **Pedestrians and Bicycles**

The proposed project would generate pedestrian trips from (1) employees to/from transit stops (see further discussion below) and (2) patrons who work and live within walking distance of the site. Overall, the volume of pedestrian trips generated by the project is expected to be relatively low and not exceed the carrying capacity of the sidewalks and crosswalks nearby. Existing pedestrian counts on North Livermore Avenue, Arroyo Plaza, Las Positas Road, and Portola Avenue show low pedestrian activity in the area (a total of 65 pedestrian trips during the AM peak hour and 28 pedestrian trips during the PM peak hour for all five intersections combined). In the project vicinity, sidewalks are provided on both sides of adjacent streets, and crosswalks are provided at all of the study intersections except the I-580 ramps (see Chapter 2 for detailed discussion). The existing pedestrian facilities in the project vicinity provide adequate connectivity to the surrounding land uses and nearby transit facilities.

Existing bicycle access to the project vicinity is provided primarily via a network of nearby Class II bike lanes and a Class I multi-use trail, which has a separate right of way exclusive for bicycles and pedestrians. Bike lanes near the project site are located on North Livermore Avenue, Las Positas Road, and Portola Avenue, while the Arroyo Las Positas Trail is located just west and east of the project site (see Chapter 2 for detailed discussion). According to the 2015 U.S. Census, bicycle trips comprise less than 1% of the total commute mode share in the City of Livermore. For the proposed project, this would equate to approximately one new bike trip during the peak commute hours. The low volume of bicycle trips generated by the project would not exceed the bicycle-carrying capacity of streets surrounding the site. The proposed project would enhance bicycle transportation by constructing a new multi-use trail along the southern edge of the site. The project also will provide bike parking on site as mentioned in the previous section.

According to the 2019 Alameda County Congestion Management Program (CMP) Transportation Impact Analysis Technical Guidelines, a project would create an impact on pedestrian and bike circulation if: (1) its vehicle trips would present a barrier to bikes/pedestrians safely crossing roadways, or (2) it would reduce or sever existing or planned bike/pedestrian circulation in the area. Based on these criteria, the proposed project would not create an adverse impact to bike/pedestrian circulation in the area.

## Transit

Transit service to the project vicinity is provided by the Livermore-Amador Valley Transit Authority (LAVTA) Local Route 15 and Rapid Route 30R. Local Route 15 provides service between the Livermore Transit Center and Springtown Boulevard, with bus stops located along North Livermore Avenue and Las Positas Road and 30R provides service between the Dublin BART station and the Livermore Transit Center along Portola Avenue (see Chapter 2 for detailed discussion). According to the 2015 U.S. Census, bus trips comprise approximately 4% of the total commute mode share in the City of Livermore. For the proposed project, this would equate to between one and two new transit trips during the peak commute hours. This volume of riders would not exceed the carrying capacity of the existing bus service near the project site.

According to the 2019 Alameda County Congestion Management Program (CMP) Transportation Impact Analysis Technical Guidelines, a project would create an impact on transit service if it: (1) causes vehicular congestion that would significantly degrade transit operations, (2) cause a ridership increase that would exceed existing transit capacity, (3) lacks adequate pedestrian connections between the project site and transit stops, or (4) conflict with existing transit service plans or preclude future transit service to the project area. Based on these criteria, the proposed project would not cause a significant impact to transit operations in the study area.

## Roadway Segment Analysis

An analysis of the potential daily traffic increase due to the proposed project was performed to identify the effect of the addition of project traffic on the volume-to-capacity ratio of select street segments. The City of Livermore *General Plan* identifies North Livermore Avenue as a Major Street, which typically carries 20,000 to 50,000 vehicles per day. The analysis focused on the daily traffic volumes of the following two key segments of North Livermore Avenue, and were compared to the typical capacity identified in the General Plan:

- North Livermore Avenue, between Arroyo Plaza and Las Positas Road
- North Livermore Avenue, between Las Positas Road and Portola Avenue

Existing daily traffic counts on these roadway segments were collected over a two-day time period in October 2019 (see Appendix A). Traffic from previously approved developments and the proposed Chick-fil-A restaurant project were added to existing daily traffic volumes to estimate traffic volumes under project conditions. In addition, cumulative daily traffic volumes with and without the proposed project were estimated using available 2040 link forecasts from the County's travel demand forecast model. The resulting traffic forecasts were compared to the typical traffic volumes identified in the City's *General Plan*. The results were as follows:

- **North Livermore Avenue between Arroyo Plaza and Las Positas Road.** There are approximately 27,500 vehicles per day (both directions) on North Livermore Avenue between Arroyo Plaza and Las Positas Road during a typical weekday. Approved developments are projected to add approximately 800 daily trips to this segment, and the proposed project is projected to add approximately 400 new primary trips per day. Thus, the total traffic volume expected under project conditions is approximately 28,700 vehicles per day. Under cumulative plus project conditions, the daily traffic volume on this segment is estimated to be 36,200. The traffic volumes forecast on this roadway segment under project and cumulative conditions are within acceptable levels based on the criteria described in the General Plan.

- **North Livermore Avenue between Las Positas Road and Portola Avenue.** There are approximately 30,900 vehicles per day (both directions) on North Livermore Avenue between Las Positas Road and Portola Avenue during a typical weekday. Approved developments are projected to add approximately 800 daily trips to this segment, and the proposed project is projected to add approximately 400 new primary trips per day. Thus, the total traffic volume expected under project conditions is approximately 32,100 daily trips. Under cumulative plus project conditions, the daily traffic volume on this segment is estimated to be 40,600. The traffic volumes forecast on this roadway segment under project and cumulative conditions are within acceptable levels based on the criteria described in the General Plan.

## Queuing Analysis

The operations analysis is based on vehicle queuing for high-demand movements at signalized intersections. Vehicle queues were estimated using a Poisson probability distribution, which estimates the probability of “n” vehicles for a vehicle movement using the following formula:

$$P(x = n) = \frac{\lambda^n e^{-\lambda}}{n!}$$

Where:

$P(x = n)$  = probability of “n” vehicles in queue per lane

$n$  = number of vehicles in the queue per lane

$\lambda$  = Average number of vehicles in the queue per lane (vehicles per hour per lane/signal cycles per hour)

The basis of the analysis is as follows: (1) the Poisson probability distribution is used to estimate the 95<sup>th</sup> percentile maximum number of queued vehicles per signal cycle for a particular movement; (2) the estimated maximum number of vehicles in the queue is translated into a queue length, assuming 25 feet per vehicle; and (3) the estimated maximum queue length is compared to the existing or planned available storage capacity for the movement. This analysis thus provides a basis for estimating future left-turn storage requirements at intersections. The 95<sup>th</sup> percentile queue length value indicates that during the peak hour, a queue of this length or less would occur on 95 percent of the signal cycles. Likewise, a queue length larger than the 95<sup>th</sup> percentile queue would only occur on 5 percent of the signal cycles (about 3 cycles during the peak hour for a signal with a 60-second cycle length). Therefore, left-turn storage pocket designs based on the 95<sup>th</sup> percentile queue length would ensure that storage space would be exceeded only 5 percent of the time. The 95<sup>th</sup> percentile queue length is also known as the “design queue length”.

The following four left-turn movements were examined as part of the queuing analysis for this project:

- Eastbound left-turn at North Livermore Avenue and Arroyo Plaza (Project Driveway)
- Northbound left-turn at North Livermore Avenue and Arroyo Plaza (Project Driveway)
- Westbound left-turn at North Livermore Avenue and I-580 Westbound Ramps
- Northbound left turn at North Livermore Avenue and I-580 Westbound Ramps

The estimated queue lengths based on the Poisson numerical calculations show queuing deficiencies for two of the four studied turn pockets (see Table 7).

### **North Livermore Avenue and I-580 WB Ramps**

The available northbound and westbound left-turn storage is expected to be adequate to accommodate existing traffic volumes and the additional traffic added by the proposed project and other approved developments in the vicinity. However, under cumulative conditions, the northbound left-turn movement on North Livermore Avenue would exceed the two-lane pocket storage by three vehicles during the PM peak hour and spillback into the upstream intersection at the I-580 EB ramps. The proposed project would add four vehicles per lane to this left-turn movement (less than one vehicle per signal cycle). The small increase in traffic volume would not increase the 95<sup>th</sup> percentile queue length. Thus, the project trips would have an insignificant impact on traffic operations at this intersection.

### **North Livermore Avenue and Arroyo Plaza**

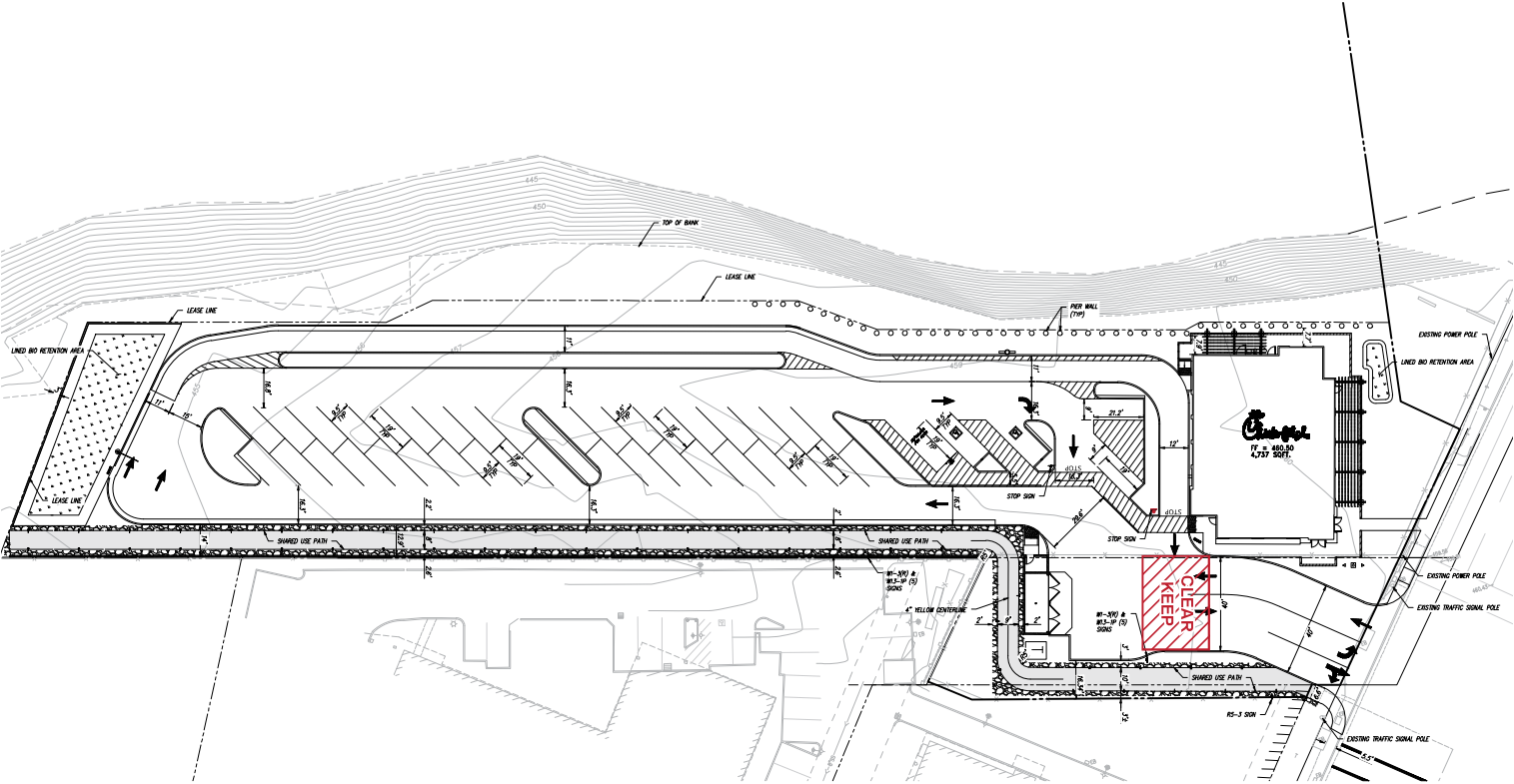
The length of the planned new northbound left-turn pocket (approximately 100 feet) would be sufficient to accommodate the 95<sup>th</sup> percentile queue length during both the AM and PM peak hours. However, the eastbound left-turn movement out of the project driveway is expected to exceed the driveway throat length by one vehicle during the AM peak hour and by one vehicle during the PM peak hour. Outbound queues at the project driveway could extend beyond the driveway throat and past the drive-through exit. Vehicles exiting the drive-through and attempting to join the standing outbound queue could temporarily block inbound driveway traffic. Therefore, it is recommended that a “Keep Clear” pavement marking and a custom caution sign, directing vehicles to wait when eastbound vehicle queues at the North Livermore Avenue/Arroyo Plaza intersection begin to stack, be placed at the drive-through exit (See Figure 13). This on-site circulation mitigation would allow for inbound vehicles to enter the site without interference or delays from exiting drive-through vehicles or vehicle queues at the outbound driveway.



**Table 7**  
**Queuing Analysis**

Measurement	N. Livermore Avenue and I-580 WB Ramps				N. Livermore Avenue and Arroyo Plaza			
	NBL		WBL		NBL		EBL	
	AM	PM	AM	PM	AM	PM	AM	PM
<b>Existing</b>								
Cycle/Delay <sup>1</sup> (sec)	55	61	55	61	115	90	115	90
Volume (vphpl )	319	297	185	152.5	0	0	0	0
Avg. Queue (veh/ln.)	4.9	5.0	2.8	2.6	0.0	0.0	0.0	0.0
Avg. Queue <sup>2</sup> (ft./ln)	122	126	71	65	0	0	0	0
95th % Queue (veh/ln.)	9	9	6	5	0	0	0	0
95th % Queue (ft./ln)	225	225	150	125	0	0	0	0
Storage (ft./ ln.)	250	250	950	950	100	100	50	50
Adequate (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y
<b>Background</b>								
Cycle/Delay <sup>1</sup> (sec)	55	61	55	61	115	90	115	90
Volume (vphpl )	328	303	190	171.5	0	0	0	0
Avg. Queue (veh/ln.)	5.0	5.1	2.9	2.9	0.0	0.0	0.0	0.0
Avg. Queue <sup>2</sup> (ft./ln)	125	128	73	73	0	0	0	0
95th % Queue (veh/ln.)	9	9	6	6	0	0	0	0
95th % Queue (ft./ln)	225	225	150	150	0	0	0	0
Storage (ft./ ln.)	250	250	950	950	100	100	50	50
Adequate (Y/N)	Y	Y	Y	Y	Y	Y	Y	Y
<b>Background Plus Project</b>								
Cycle/Delay <sup>1</sup> (sec)	55	61	55	61	70	70	70	70
Volume (vphpl )	339	307	201	175.5	57	29	64	34
Avg. Queue (veh/ln.)	5.2	5.2	3.1	3.0	1.1	0.6	1.2	0.7
Avg. Queue <sup>2</sup> (ft./ln)	129	130	77	74	28	14	31	17
95th % Queue (veh/ln.)	9	9	6	6	3	2	3	2
95th % Queue (ft./ln)	225	225	150	150	75	50	75	50
Storage (ft./ ln.)	250	250	950	950	100	100	50	50
Adequate (Y/N)	Y	Y	Y	Y	Y	Y	N	Y
<b>Cumulative</b>								
Cycle/Delay <sup>1</sup> (sec)	55	61	55	61	115	90	115	90
Volume (vphpl )	376	496	190	171.5	0	0	0	0
Avg. Queue (veh/ln.)	5.7	8.4	2.9	2.9	0.0	0.0	0.0	0.0
Avg. Queue <sup>2</sup> (ft./ln)	144	210	73	73	0	0	0	0
95th % Queue (veh/ln.)	10	13	6	6	0	0	0	0
95th % Queue (ft./ln)	250	325	150	150	0	0	0	0
Storage (ft./ ln.)	250	250	950	950	100	100	50	50
Adequate (Y/N)	Y	N	Y	Y	Y	Y	Y	Y
<b>Cumulative Plus Project</b>								
Cycle/Delay <sup>1</sup> (sec)	55	61	55	61	75	90	75	90
Volume (vphpl )	387	500	201	176	57	29	64	34
Avg. Queue (veh/ln.)	5.9	8.5	3.1	3.0	1.2	0.7	1.3	0.9
Avg. Queue <sup>2</sup> (ft./ln)	148	212	77	74	30	18	33	21
95th % Queue (veh/ln.)	10	13	6	6	3	2	3	3
95th % Queue (ft./ln)	250	325	150	150	75	50	75	75
Storage (ft./ ln.)	250	250	950	950	100	100	50	50
Adequate (Y/N)	Y	N	Y	Y	Y	Y	N	N
<b>Notes:</b>								
<sup>1</sup> Vehicle queue calculations based on cycle length for signalized intersections.								
<sup>2</sup> Assumes 25 Feet Per Vehicle								





LEGEND

▼ = Custom Caution Sign



Figure 13  
Circulation Mitigation



## 7. Conclusions

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The potential impacts of the project were evaluated in accordance with the standards set forth by the City of Livermore Avenue and the Alameda County Transportation Commission (CTC) Congestion Management Program (CMP). The study included the analysis of traffic conditions at five signalized intersections and two roadway segments during the weekday AM and PM peak hours. The weekday peak hours are typically between 7:00 and 9:00 AM and between 4:00 and 6:00 PM.

### Intersection Level of Service Analysis

The analysis determined that under all scenarios with and without the project, all but one study intersection are expected to operate at acceptable levels of service. Under cumulative conditions, the intersection of North Livermore Avenue and Portola Road would exceed mid-level LOS D with and without the proposed project. However, the project is expected to have an insignificant impact at the intersection. Therefore, the proposed project would not have a significant impact at any of the study intersections.

### Vehicle Miles Travelled

Senate Bill (SB) 743, signed into law in 2013, requires CEQA lead agencies to shift from using traditional LOS standards and automobile delay to determine significant traffic impacts. Since the City of Livermore has not yet adopted a policy or established any thresholds based on VMT, the potential impacts of this project were determined based upon the City of Livermore's adopted LOS-based methodology. Nevertheless, according to the new guidelines, local-serving retail developments such as the proposed project are presumed to have a less than significant impact on VMT since they generally result in shorter trip lengths.

### Site Access and On-Site Circulation

The driveway would have one inbound lane and two outbound lanes (a left-turn lane and a shared through/right-turn lane) with a width of 40 feet (one 16-foot inbound lane and two 12-foot outbound lanes) for a distance of approximately 50 feet. The driveway width would meet the City's minimum requirement of 24 feet for a two-way driveway and will be able to accommodate vehicle turns to and from the site.

### Drive-Through Analysis

The City of Livermore Development Code does not specify requirements for the restaurant drive-through lane. Based on observations of vehicle queues during the peak lunch and dinner hours on a typical weekday and Saturday at two other Chick-fil-A restaurants in San Jose and Fremont, the proposed drive-through stacking space is expected to be sufficient for all time periods. Although the

drive-through queue is not expected to overflow the storage space provided, there is ample space on site to accommodate any excess drive-through queue before reaching North Livermore Avenue.

## Parking

The proposed vehicle and bicycle parking supply would meet the minimum parking requirements set forth in the City of Livermore zoning regulations.

## Pedestrian, Bicycle, and Transit Analysis

The proposed project would enhance bicycle transportation by constructing a new multi-use trail along the southern edge of the site. According to the 2019 Alameda County Congestion Management Program (CMP) Transportation Impact Analysis Technical Guidelines, the proposed project would not have an adverse effect on the existing transit, pedestrian, or bicycle facilities in the study area. Thus, no project sponsored improvements would be necessary.

## Roadway Segment Analysis

The City of Livermore *General Plan* identifies North Livermore Avenue as a Major Street, which typically carries 20,000 to 50,000 vehicles per day. Under all scenarios, the projected traffic volumes on North Livermore Avenue are expected to remain within the acceptable volume levels described in the General Plan.

## Queuing Analysis

The estimated queue lengths based on the Poisson numerical calculations show queuing deficiencies for some turn pockets.

### North Livermore Avenue and I-580 WB Ramps

Under cumulative conditions, the northbound left-turn movement on North Livermore Avenue would exceed the two-lane pocket storage by three vehicles during the PM peak hour and spillback into the North Livermore Avenue/I-580 EB ramps intersection. The proposed project would add four vehicles per lane to the left-turn movement (less than one vehicle per signal cycle). The small increase in traffic volume would not increase the 95<sup>th</sup> percentile queue length. Thus, the project trips would have an insignificant impact on traffic operations at this intersection.

### North Livermore Avenue and Arroyo Plaza

The length of the planned new northbound left-turn pocket (approximately 100 feet) would be sufficient to accommodate the 95<sup>th</sup> percentile queue length during both the AM and PM peak hours. However, the eastbound left-turn movement out of the project driveway is expected to exceed the driveway throat length by one vehicle during the AM peak hour and by one vehicle during the PM peak hour.

Outbound queues at the project driveway could extend beyond the driveway throat and past the drive-through exit. A “Keep Clear” pavement marking and a custom caution sign, directing vehicles to wait when eastbound vehicles queues at the North Livermore Avenue/Arroyo Plaza intersection begin to stack, are recommended at the drive-through exit to allow for inbound vehicles to enter the site without interference or delays.

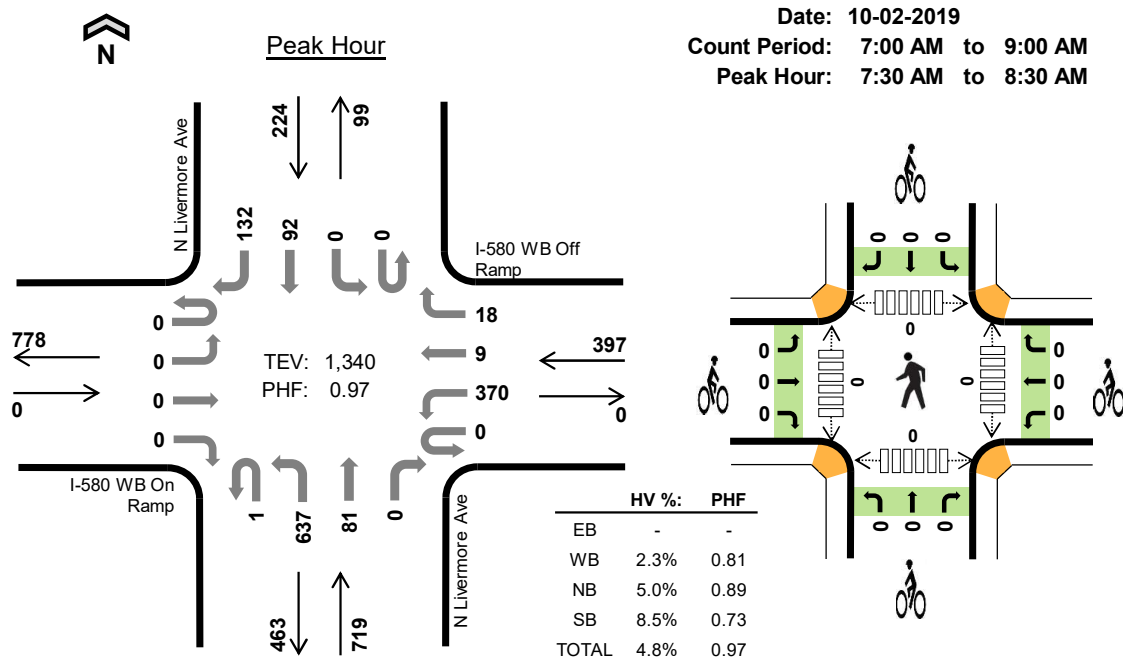
# **Chick-fil-A Restaurant – North Livermore Avenue TIA Technical Appendices**

May 1, 2020

## **Appendix A**

### **Traffic Counts**

# N Livermore Ave I-580 WB Ramps



## Two-Hour Count Summaries

Interval Start		I-580 WB On Ramp				I-580 WB Off Ramp				N Livermore Ave				N Livermore Ave				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	0	0	0	0	54	0	3	0	175	18	0	0	0	20	22	292	0
7:15 AM		0	0	0	0	0	70	0	4	0	179	15	0	0	0	10	14	292	0
7:30 AM		0	0	0	0	0	78	1	9	1	159	13	0	0	0	28	49	338	0
7:45 AM		0	0	0	0	0	92	2	7	0	172	16	0	0	0	20	32	341	1,263
8:00 AM		0	0	0	0	0	117	3	2	0	131	26	0	0	0	33	35	347	1,318
8:15 AM		0	0	0	0	0	83	3	0	0	175	26	0	0	0	11	16	314	1,340
8:30 AM		0	0	0	0	0	95	2	2	1	161	12	0	0	0	35	28	336	1,338
8:45 AM		0	0	0	0	0	104	5	3	0	130	18	0	0	0	26	46	332	1,329
Count Total		0	0	0	0	0	693	16	30	2	1,282	144	0	0	0	183	242	2,592	0
Peak Hour	All	0	0	0	0	0	370	9	18	1	637	81	0	0	0	92	132	1,340	0
	HV	0	0	0	0	0	7	1	1	0	16	20	0	0	0	6	13	64	0
	HV%	-	-	-	-	-	2%	11%	6%	0%	3%	25%	-	-	-	7%	10%	5%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	7	1	8	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	6	3	9	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	2	6	7	15	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	2	9	3	14	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	4	11	7	22	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	1	10	2	13	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	1	6	5	12	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	4	6	5	15	0	0	0	1	1	0	0	0	0	0
Count Total	0	14	61	33	108	0	0	0	1	1	0	0	0	0	0
Peak Hour	0	9	36	19	64	0	0	0	0	0	0	0	0	0	0

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	I-580 WB On Ramp				I-580 WB Off Ramp				N Livermore Ave				N Livermore Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	4	3	0	0	0	0	1	8	0
7:15 AM	0	0	0	0	0	0	0	0	0	2	4	0	0	0	1	2	9	0
7:30 AM	0	0	0	0	0	2	0	0	0	4	2	0	0	0	3	4	15	0
7:45 AM	0	0	0	0	0	1	0	1	0	3	6	0	0	0	1	2	14	46
8:00 AM	0	0	0	0	0	4	0	0	0	6	5	0	0	0	2	5	22	60
8:15 AM	0	0	0	0	0	0	1	0	0	3	7	0	0	0	0	2	13	64
8:30 AM	0	0	0	0	0	1	0	0	0	3	3	0	0	0	2	3	12	61
8:45 AM	0	0	0	0	0	4	0	0	0	3	3	0	0	0	0	5	15	62
Count Total	0	0	0	0	0	12	1	1	0	28	33	0	0	0	9	24	108	0
Peak Hour	0	0	0	0	0	7	1	1	0	16	20	0	0	0	6	13	64	0

Two-Hour Count Summaries - Bikes																		
Interval Start	I-580 WB On Ramp			I-580 WB Off Ramp			N Livermore Ave			N Livermore Ave			15-min Total	Rolling One Hour				
	Eastbound			Westbound			Northbound			Southbound								
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT						
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	1	1				
Count Total	0	0	0	0	0	0	0	0	0	0	0	1	1	0				
Peak Hour	0	0	0	0	0	0	0	0	0	0	0	0	0	0				

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

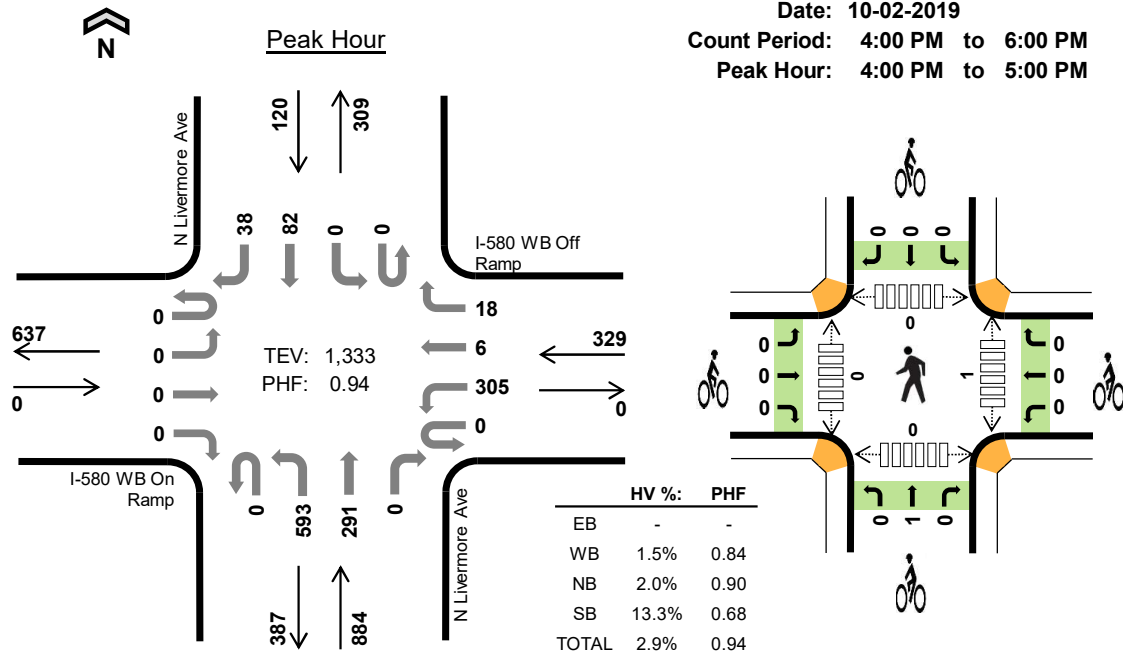
## N Livermore Ave I-580 WB Ramps



Date: 10-02-2019

Count Period: 4:00 PM to 6:00 PM

Peak Hour: 4:00 PM to 5:00 PM



### Two-Hour Count Summaries

Interval Start		I-580 WB On Ramp				I-580 WB Off Ramp				N Livermore Ave				N Livermore Ave				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	0	0	0	0	70	3	7	0	138	76	0	0	0	27	17	338	0
4:15 PM		0	0	0	0	0	63	0	2	0	133	82	0	0	0	15	6	301	0
4:30 PM		0	0	0	0	0	78	3	5	0	170	76	0	0	0	15	6	353	0
4:45 PM		0	0	0	0	0	94	0	4	0	152	57	0	0	0	25	9	341	1,333
5:00 PM		0	0	0	0	0	72	1	7	0	146	73	0	0	0	14	5	318	1,313
5:15 PM		0	0	0	0	0	75	1	3	0	139	91	0	0	0	2	1	312	1,324
5:30 PM		0	0	0	0	0	65	0	3	0	144	74	0	0	0	36	18	340	1,311
5:45 PM		0	0	0	0	0	60	0	7	0	107	57	0	0	0	31	14	276	1,246
Count Total		0	0	0	0	0	577	8	38	0	1,129	586	0	0	0	165	76	2,579	0
Peak Hour	All	0	0	0	0	0	305	6	18	0	593	291	0	0	0	82	38	1,333	0
	HV	0	0	0	0	0	4	0	1	0	8	10	0	0	0	2	14	39	0
	HV%	-	-	-	-	-	1%	0%	6%	-	1%	3%	-	-	-	2%	37%	3%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	1	6	9	16	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	3	6	1	10	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	1	4	4	9	0	0	1	0	1	0	0	0	0	0
4:45 PM	0	0	2	2	4	0	0	0	0	0	1	0	0	0	1
5:00 PM	0	0	1	2	3	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	3	3	0	6	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	1	5	0	6	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0
Count Total	0	9	28	19	56	0	0	1	0	1	1	0	0	0	1
Peak Hour	0	5	18	16	39	0	0	1	0	1	1	0	0	0	1

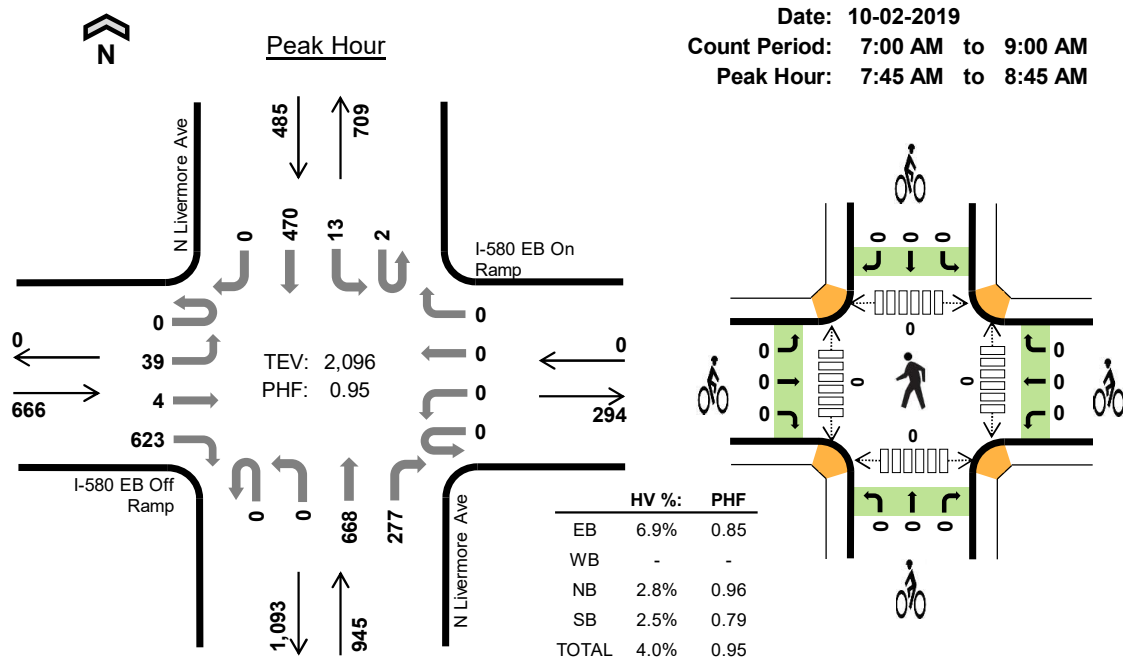


Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	I-580 WB On Ramp				I-580 WB Off Ramp				N Livermore Ave				N Livermore Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	1	0	0	0	3	3	0	0	0	1	8	16	0
4:15 PM	0	0	0	0	0	3	0	0	0	1	5	0	0	0	0	1	10	0
4:30 PM	0	0	0	0	0	0	0	1	0	2	2	0	0	0	1	3	9	0
4:45 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	4	39
5:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	3	26
5:15 PM	0	0	0	0	0	3	0	0	0	1	2	0	0	0	0	0	6	22
5:30 PM	0	0	0	0	0	1	0	0	0	4	1	0	0	0	0	0	6	19
5:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	2	17
Count Total	0	0	0	0	0	8	0	1	0	15	13	0	0	0	4	15	56	0
Peak Hour	0	0	0	0	0	4	0	1	0	8	10	0	0	0	2	14	39	0

Two-Hour Count Summaries - Bikes																		
Interval Start	I-580 WB On Ramp			I-580 WB Off Ramp			N Livermore Ave			N Livermore Ave			15-min Total	Rolling One Hour				
	Eastbound			Westbound			Northbound			Southbound								
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT						
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
4:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	0				
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1				
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1				
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1				
5:30 PM	0	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	0				
Count Total	0	0	0	0	0	0	0	1	0	0	0	0	1	0				
Peak Hour	0	0	0	0	0	0	0	1	0	0	0	0	1	0				

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

## N Livermore Ave I-580 EB Ramps



### Two-Hour Count Summaries

Interval Start		I-580 EB Off Ramp				I-580 EB On Ramp				N Livermore Ave				N Livermore Ave				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	11	1	80	0	0	0	0	0	0	176	58	0	2	70	0	398	0
7:15 AM		0	5	1	107	0	0	0	0	0	0	197	62	1	3	76	0	452	0
7:30 AM		0	5	1	137	0	0	0	0	0	0	159	61	1	6	99	0	469	0
7:45 AM		0	11	3	160	0	0	0	0	0	0	166	79	1	3	110	0	533	1,852
8:00 AM		0	10	1	144	0	0	0	0	0	0	165	80	0	7	147	0	554	2,008
8:15 AM		0	13	0	182	0	0	0	0	0	0	178	67	0	1	89	0	530	2,086
8:30 AM		0	5	0	137	0	0	0	0	0	0	159	51	1	2	124	0	479	2,096
8:45 AM		0	6	0	142	0	0	0	0	0	0	139	55	0	2	131	0	475	2,038
Count Total		0	66	7	1,089	0	0	0	0	0	0	1,339	513	4	26	846	0	3,890	0
Peak Hour	All	0	39	4	623	0	0	0	0	0	0	668	277	2	13	470	0	2,096	0
	HV	0	18	2	26	0	0	0	0	0	0	17	9	2	5	5	0	84	0
	HV%	-	46%	50%	4%	-	-	-	-	-	-	3%	3%	100%	38%	1%	-	4%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	9	0	4	0	13	0	0	0	0	0	0	0	0	0	0
7:15 AM	5	0	4	1	10	0	0	0	0	0	0	0	0	0	0
7:30 AM	5	0	8	5	18	0	0	0	0	0	0	0	0	0	0
7:45 AM	11	0	4	2	17	0	0	0	0	0	0	0	0	0	0
8:00 AM	13	0	10	6	29	0	0	0	0	0	0	0	0	0	0
8:15 AM	13	0	6	0	19	0	0	0	0	0	0	0	0	0	0
8:30 AM	9	0	6	4	19	0	0	0	0	0	0	0	0	0	0
8:45 AM	6	0	9	3	18	0	0	0	0	0	0	0	0	0	0
Count Total	71	0	51	21	143	0	0	0	0	0	0	0	0	0	0
Peak Hour	46	0	26	12	84	0	0	0	0	0	0	0	0	0	0

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	I-580 EB Off Ramp				I-580 EB On Ramp				N Livermore Ave				N Livermore Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	4	0	5	0	0	0	0	0	0	4	0	0	0	0	0	13	0
7:15 AM	0	1	0	4	0	0	0	0	0	0	2	2	1	0	0	0	10	0
7:30 AM	0	1	0	4	0	0	0	0	0	0	6	2	1	0	4	0	18	0
7:45 AM	0	6	1	4	0	0	0	0	0	0	2	2	1	0	1	0	17	58
8:00 AM	0	4	1	8	0	0	0	0	0	0	7	3	0	5	1	0	29	74
8:15 AM	0	7	0	6	0	0	0	0	0	0	3	3	0	0	0	0	19	83
8:30 AM	0	1	0	8	0	0	0	0	0	0	5	1	1	0	3	0	19	84
8:45 AM	0	2	0	4	0	0	0	0	0	0	3	6	0	0	3	0	18	85
Count Total	0	26	2	43	0	0	0	0	0	0	32	19	4	5	12	0	143	0
Peak Hour	0	18	2	26	0	0	0	0	0	0	17	9	2	5	5	0	84	0

Two-Hour Count Summaries - Bikes																		
Interval Start	I-580 EB Off Ramp			I-580 EB On Ramp			N Livermore Ave			N Livermore Ave			15-min Total	Rolling One Hour				
	Eastbound			Westbound			Northbound			Southbound								
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT						
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Peak Hour	0	0	0	0	0	0	0	0	0	0	0	0	0	0				

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

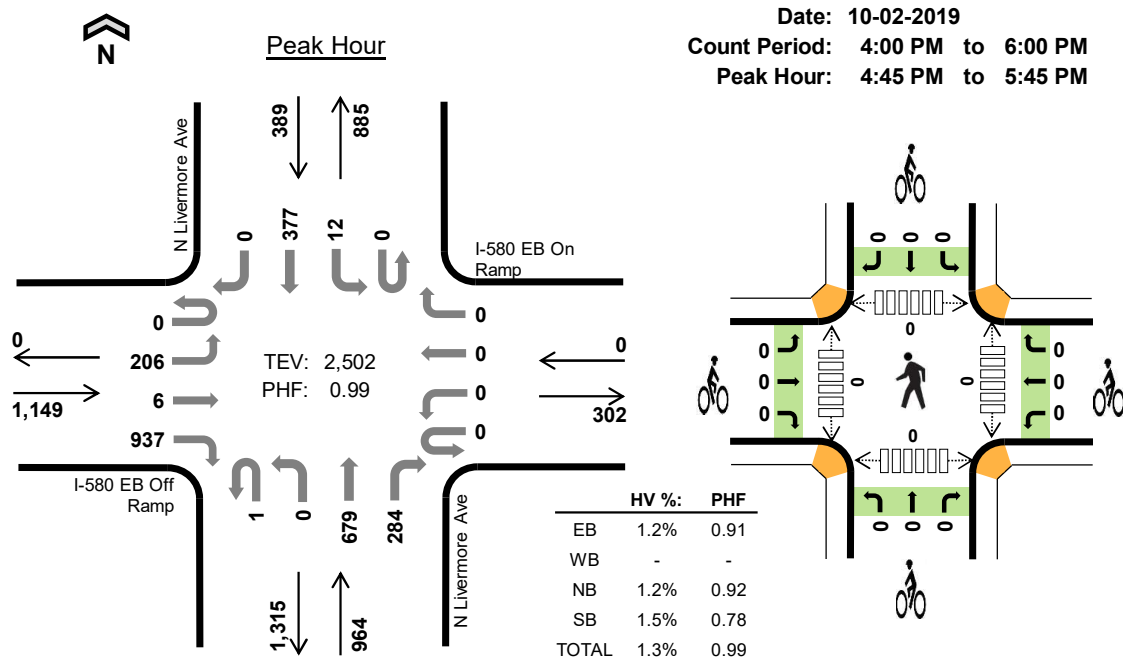
# N Livermore Ave I-580 EB Ramps



Date: 10-02-2019

Count Period: 4:00 PM to 6:00 PM

Peak Hour: 4:45 PM to 5:45 PM



## Two-Hour Count Summaries

Interval Start		I-580 EB Off Ramp				I-580 EB On Ramp				N Livermore Ave				N Livermore Ave				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	58	1	216	0	0	0	0	0	0	163	93	0	3	92	0	626	0
4:15 PM		0	57	3	235	0	0	0	0	0	0	157	69	1	4	76	0	602	0
4:30 PM		0	46	1	196	0	0	0	0	0	0	203	77	0	4	89	0	616	0
4:45 PM		0	37	1	198	0	0	0	0	0	0	179	83	0	6	118	0	622	2,466
5:00 PM		0	50	2	248	0	0	0	0	0	0	168	69	0	1	85	0	623	2,463
5:15 PM		0	62	1	252	0	0	0	0	1	0	160	78	0	1	73	0	628	2,489
5:30 PM		0	57	2	239	0	0	0	0	0	0	172	54	0	4	101	0	629	2,502
5:45 PM		0	32	3	240	0	0	0	0	0	0	141	80	0	3	87	0	586	2,466
Count Total		0	399	14	1,824	0	0	0	0	1	0	1,343	603	1	26	721	0	4,932	0
Peak Hour	All	0	206	6	937	0	0	0	0	1	0	679	284	0	12	377	0	2,502	0
	HV	0	3	0	11	0	0	0	0	0	0	8	4	0	1	5	0	32	0
	HV%	-	1%	0%	1%	-	-	-	-	0%	-	1%	1%	-	8%	1%	-	1%	0

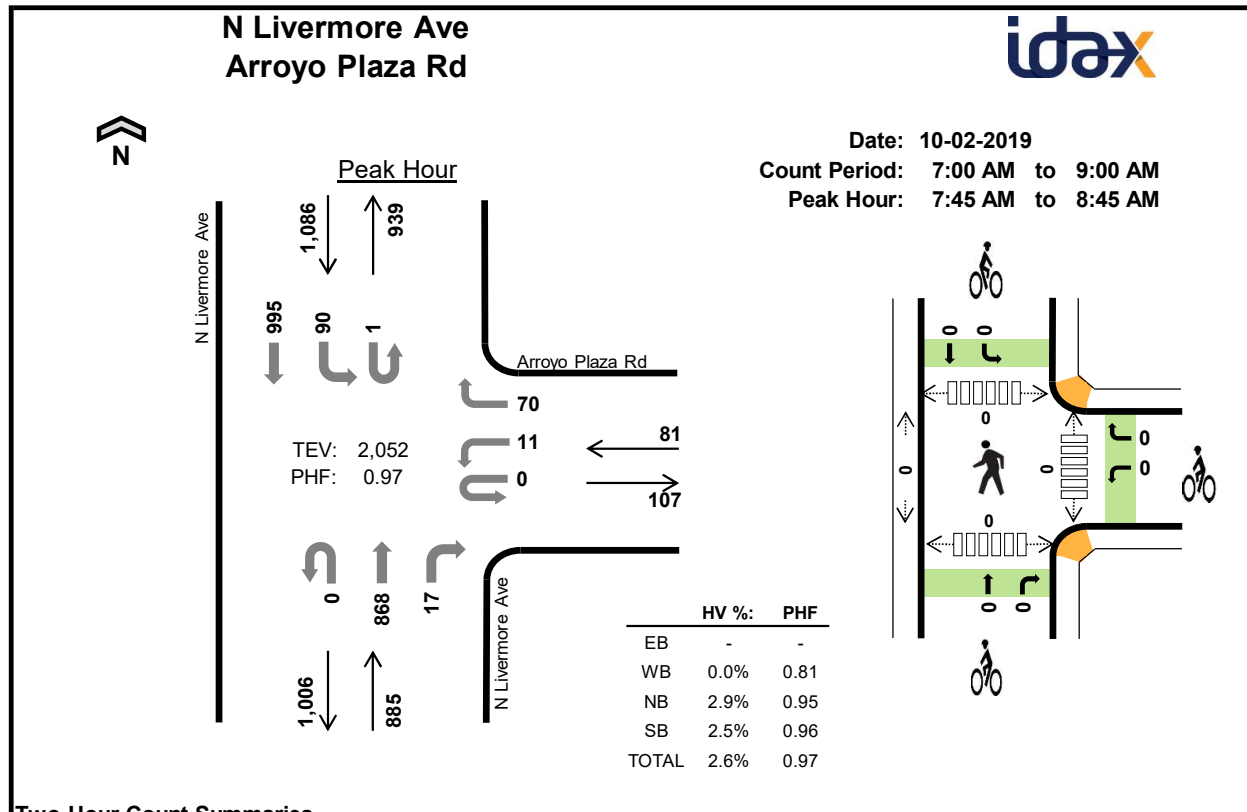
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	5	0	4	1	10	0	0	0	0	0	0	0	0	0	0
4:15 PM	4	0	2	4	10	0	0	0	0	0	0	0	0	0	0
4:30 PM	4	0	4	1	9	0	0	1	0	1	0	1	0	0	1
4:45 PM	3	0	2	0	5	0	0	0	0	0	0	0	0	0	0
5:00 PM	5	0	1	1	7	0	0	0	0	0	0	0	0	0	0
5:15 PM	4	0	4	3	11	0	0	0	0	0	0	0	0	0	0
5:30 PM	2	0	5	2	9	0	0	0	0	0	0	0	0	0	0
5:45 PM	2	0	2	0	4	0	0	0	0	0	0	0	0	0	0
Count Total	29	0	24	12	65	0	0	1	0	1	0	1	0	0	1
Peak Hour	14	0	12	6	32	0	0	0	0	0	0	0	0	0	0

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	I-580 EB Off Ramp				I-580 EB On Ramp				N Livermore Ave				N Livermore Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	2	0	3	0	0	0	0	0	0	4	0	0	0	1	0	10	0
4:15 PM	0	3	0	1	0	0	0	0	0	0	2	0	0	1	3	0	10	0
4:30 PM	0	2	0	2	0	0	0	0	0	0	3	1	0	0	1	0	9	0
4:45 PM	0	0	0	3	0	0	0	0	0	0	2	0	0	0	0	0	5	34
5:00 PM	0	1	0	4	0	0	0	0	0	0	0	1	0	0	1	0	7	31
5:15 PM	0	1	0	3	0	0	0	0	0	0	2	2	0	1	2	0	11	32
5:30 PM	0	1	0	1	0	0	0	0	0	0	4	1	0	0	2	0	9	32
5:45 PM	0	0	0	2	0	0	0	0	0	0	1	1	0	0	0	0	4	31
Count Total	0	10	0	19	0	0	0	0	0	0	18	6	0	2	10	0	65	0
Peak Hour	0	3	0	11	0	0	0	0	0	0	8	4	0	1	5	0	32	0

Two-Hour Count Summaries - Bikes																	
Interval Start	I-580 EB Off Ramp			I-580 EB On Ramp			N Livermore Ave			N Livermore Ave			15-min Total	Rolling One Hour			
	Eastbound			Westbound			Northbound			Southbound							
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT					
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
4:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	0			
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1			
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1			
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1			
5:30 PM	0	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	0			
Count Total	0	0	0	0	0	0	0	1	0	0	0	0	1	0			
Peak Hour	0	0	0	0	0	0	0	0	0	0	0	0	0	0			

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

**Two-Hour Count Summaries**

Interval Start		n/a				Arroyo Plaza Rd				N Livermore Ave				N Livermore Ave				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	0	0	0	0	0	0	7	0	0	230	2	0	11	135	0	385	0
7:15 AM		0	0	0	0	0	2	0	10	0	0	250	2	0	28	157	0	449	0
7:30 AM		0	0	0	0	0	2	0	20	0	0	195	1	0	24	213	0	455	0
7:45 AM		0	0	0	0	0	1	0	24	0	0	220	5	0	27	245	0	522	1,811
8:00 AM		0	0	0	0	0	5	0	12	0	0	228	4	1	22	258	0	530	1,956
8:15 AM		0	0	0	0	0	2	0	17	0	0	226	3	0	24	258	0	530	2,037
8:30 AM		0	0	0	0	0	3	0	17	0	0	194	5	0	17	234	0	470	2,052
8:45 AM		0	0	0	0	0	5	0	13	0	0	179	8	0	25	247	0	477	2,007
Count Total		0	0	0	0	0	20	0	120	0	0	1,722	30	1	178	1,747	0	3,818	0
Peak Hour	All	0	0	0	0	0	11	0	70	0	0	868	17	1	90	995	0	2,052	0
	HV	0	0	0	0	0	0	0	0	0	0	26	0	0	0	27	0	53	0
	HV%	-	-	-	-	-	0%	-	0%	-	-	3%	0%	0%	0%	3%	-	3%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

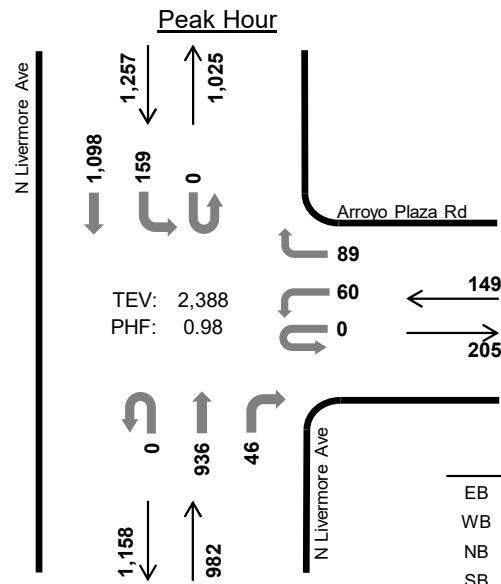
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	4	5	9	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	4	4	8	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	1	7	8	16	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	4	5	9	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	10	9	19	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	6	6	12	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	6	7	13	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	9	10	19	0	0	0	0	0	0	0	0	0	0
Count Total	0	1	50	54	105	0	0	0	0	0	0	0	0	0	0
Peak Hr	0	0	26	27	53	0	0	0	0	0	0	0	0	0	0

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	n/a				Arroyo Plaza Rd				N Livermore Ave				N Livermore Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	5	0	9	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	8	0
7:30 AM	0	0	0	0	0	0	0	1	0	0	7	0	0	2	6	0	16	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	5	0	9	42
8:00 AM	0	0	0	0	0	0	0	0	0	0	10	0	0	0	9	0	19	52
8:15 AM	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6	0	12	56
8:30 AM	0	0	0	0	0	0	0	0	0	0	6	0	0	0	7	0	13	53
8:45 AM	0	0	0	0	0	0	0	0	0	0	9	0	0	0	10	0	19	63
Count Total	0	0	0	0	0	0	0	1	0	0	50	0	0	2	52	0	105	0
Peak Hour	0	0	0	0	0	0	0	0	0	0	26	0	0	0	27	0	53	0

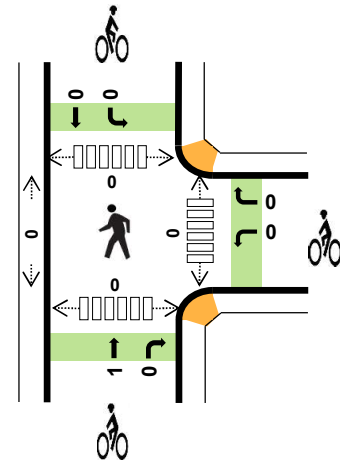
Two-Hour Count Summaries - Bikes																		
Interval Start	n/a				Arroyo Plaza Rd				N Livermore Ave				N Livermore Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	LT	TH	RT		LT	TH	RT		LT	TH	RT		LT	TH	RT			
7:00 AM	0	0	0		0	0	0		0	0	0		0	0	0		0	0
7:15 AM	0	0	0		0	0	0		0	0	0		0	0	0		0	0
7:30 AM	0	0	0		0	0	0		0	0	0		0	0	0		0	0
7:45 AM	0	0	0		0	0	0		0	0	0		0	0	0		0	0
8:00 AM	0	0	0		0	0	0		0	0	0		0	0	0		0	0
8:15 AM	0	0	0		0	0	0		0	0	0		0	0	0		0	0
8:30 AM	0	0	0		0	0	0		0	0	0		0	0	0		0	0
8:45 AM	0	0	0		0	0	0		0	0	0		0	0	0		0	0
Count Total	0	0	0		0	0	0		0	0	0		0	0	0		0	0
Peak Hour	0	0	0		0	0	0		0	0	0		0	0	0		0	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

# N Livermore Ave Arroyo Plaza Rd



Date: 10-02-2019  
Count Period: 4:00 PM to 6:00 PM  
Peak Hour: 4:30 PM to 5:30 PM



	HV %:	PHF
EB	-	-
WB	0.7%	0.83
NB	1.0%	0.88
SB	1.3%	0.95
TOTAL	1.1%	0.98

## Two-Hour Count Summaries

Interval Start		n/a				Arroyo Plaza Rd				N Livermore Ave				N Livermore Ave				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	0	0	0	0	6	0	29	0	0	223	9	0	32	270	0	569	0
4:15 PM		0	0	0	0	0	13	0	16	0	0	207	8	1	29	284	0	558	0
4:30 PM		0	0	0	0	0	14	0	20	0	0	261	18	0	31	246	0	590	0
4:45 PM		0	0	0	0	0	10	0	20	0	0	240	10	0	46	276	0	602	2,319
5:00 PM		0	0	0	0	0	18	0	22	0	0	213	8	0	41	287	0	589	2,339
5:15 PM		0	0	0	0	0	18	0	27	0	0	222	10	0	41	289	0	607	2,388
5:30 PM		0	0	0	0	0	12	0	23	0	0	193	16	0	26	312	0	582	2,380
5:45 PM		0	0	0	0	0	16	0	20	0	0	203	10	0	42	282	0	573	2,351
Count Total		0	0	0	0	0	107	0	177	0	0	1,762	89	1	288	2,246	0	4,670	0
Peak Hour	All	0	0	0	0	0	60	0	89	0	0	936	46	0	159	1,098	0	2,388	0
	HV	0	0	0	0	0	0	0	1	0	0	10	0	0	2	14	0	27	0
	HV%	-	-	-	-	-	0%	-	1%	-	-	1%	0%	-	1%	1%	-	1%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	0	0	4	4	8	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	2	4	6	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	4	3	7	0	0	1	0	1	0	0	0	0	0
4:45 PM	0	0	2	3	5	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	1	0	5	6	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	4	5	9	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	1	5	2	8	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	1	1	3	5	0	0	0	0	0	0	0	0	0	0
Count Total	0	3	22	29	54	0	0	1	0	1	0	0	0	0	0
Peak Hr	0	1	10	16	27	0	0	1	0	1	0	0	0	0	0



Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	n/a				Arroyo Plaza Rd				N Livermore Ave				N Livermore Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	0	8	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	4	0	6	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	1	2	0	7	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	1	2	0	5	26
5:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	5	0	6	24
5:15 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	5	0	9	27
5:30 PM	0	0	0	0	0	0	0	1	0	0	4	1	0	0	2	0	8	28
5:45 PM	0	0	0	0	0	0	0	1	0	0	1	0	0	1	2	0	5	28
Count Total	0	0	0	0	0	0	0	3	0	0	21	1	0	3	26	0	54	0
Peak Hour	0	0	0	0	0	0	0	1	0	0	10	0	0	2	14	0	27	0

Two-Hour Count Summaries - Bikes																		
Interval Start	n/a				Arroyo Plaza Rd				N Livermore Ave				N Livermore Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	LT	TH	RT		LT	TH	RT		LT	TH	RT		LT	TH	RT			
4:00 PM	0	0	0		0	0	0		0	0	0		0	0	0		0	0
4:15 PM	0	0	0		0	0	0		0	0	0		0	0	0		0	0
4:30 PM	0	0	0		0	0	0		0	1	0		0	0	0		1	0
4:45 PM	0	0	0		0	0	0		0	0	0		0	0	0		0	1
5:00 PM	0	0	0		0	0	0		0	0	0		0	0	0		0	1
5:15 PM	0	0	0		0	0	0		0	0	0		0	0	0		0	1
5:30 PM	0	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	0
Count Total	0	0	0		0	0	0		0	1	0		0	0	0		1	0
Peak Hour	0	0	0		0	0	0		0	1	0		0	0	0		1	0

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

# N Livermore Ave Las Positas Rd

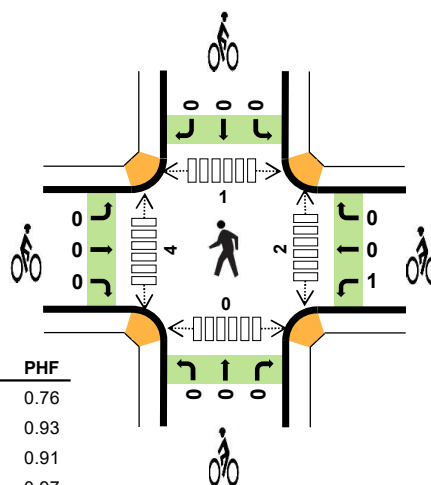
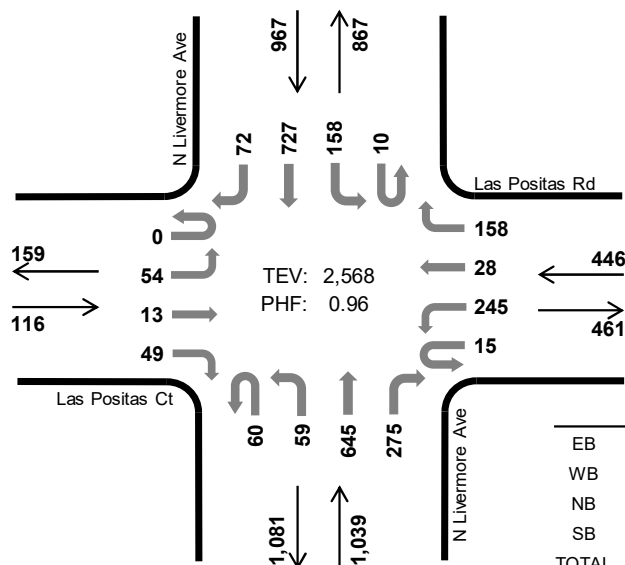


Peak Hour

Date: 10-02-2019

Count Period: 7:00 AM to 9:00 AM

Peak Hour: 8:00 AM to 9:00 AM



	HV %:	PHF
EB	5.2%	0.76
WB	3.1%	0.93
NB	2.1%	0.91
SB	3.0%	0.97
TOTAL	2.8%	0.96

## Two-Hour Count Summaries

Interval Start		Las Positas Ct				Las Positas Rd				N Livermore Ave				N Livermore Ave				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	14	3	10	2	23	6	38	2	7	169	30	2	17	82	13	418	0
7:15 AM		0	9	0	12	1	28	8	41	0	14	193	22	2	20	107	15	472	0
7:30 AM		0	11	1	11	1	40	6	32	1	18	157	41	5	34	157	10	525	0
7:45 AM		0	15	4	11	0	50	6	37	3	9	163	43	3	26	177	29	576	1,991
8:00 AM		0	12	2	8	5	49	11	38	8	9	189	30	2	37	180	27	607	2,180
8:15 AM		0	14	2	16	5	62	8	32	21	22	172	70	3	46	187	12	672	2,380
8:30 AM		0	9	4	11	2	66	5	47	15	12	161	78	4	44	171	15	644	2,499
8:45 AM		0	19	5	14	3	68	4	41	16	16	123	97	1	31	189	18	645	2,568
Count Total		0	103	21	93	19	386	54	306	66	107	1,327	411	22	255	1,250	139	4,559	0
Peak Hour	All	0	54	13	49	15	245	28	158	60	59	645	275	10	158	727	72	2,568	0
	HV	0	4	1	1	0	6	1	7	0	2	17	3	1	5	21	2	71	0
	HV%	-	7%	8%	2%	0%	2%	4%	4%	0%	3%	3%	1%	10%	3%	3%	3%	3%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	1	3	4	8	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	3	3	5	11	0	1	0	0	1	1	0	0	0	1
7:30 AM	2	1	3	6	12	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	2	5	5	12	0	0	0	0	0	0	1	0	0	1
8:00 AM	1	5	7	7	20	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	5	5	6	16	0	0	0	0	0	0	3	1	0	4
8:30 AM	1	1	4	8	14	0	1	0	0	1	0	0	0	0	0
8:45 AM	4	3	6	8	21	0	0	0	0	0	2	1	0	0	3
Count Total	8	21	36	49	114	0	2	0	0	2	3	5	1	0	9
Peak Hour	6	14	22	29	71	0	1	0	0	1	2	4	1	0	7

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	Las Positas Ct				Las Positas Rd				N Livermore Ave				N Livermore Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	1	0	0	3	0	0	2	2	0	8	0
7:15 AM	0	0	0	0	0	1	0	2	0	0	1	2	1	0	4	0	11	0
7:30 AM	0	1	1	0	0	0	0	1	0	0	2	1	0	0	6	0	12	0
7:45 AM	0	0	0	0	0	1	0	1	0	0	4	1	0	1	4	0	12	43
8:00 AM	0	1	0	0	0	1	1	3	0	0	7	0	0	1	5	1	20	55
8:15 AM	0	0	0	0	0	4	0	1	0	1	3	1	0	1	5	0	16	60
8:30 AM	0	1	0	0	0	0	0	1	0	0	3	1	1	2	4	1	14	62
8:45 AM	0	2	1	1	0	1	0	2	0	1	4	1	0	1	7	0	21	71
Count Total	0	5	2	1	0	8	1	12	0	2	27	7	2	8	37	2	114	0
Peak Hour	0	4	1	1	0	6	1	7	0	2	17	3	1	5	21	2	71	0

Two-Hour Count Summaries - Bikes																	
Interval Start	Las Positas Ct			Las Positas Rd			N Livermore Ave			N Livermore Ave			15-min Total	Rolling One Hour			
	Eastbound			Westbound			Northbound			Southbound							
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT					
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	1	0			
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1			
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1			
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
8:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	1	1			
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1			
Count Total	0	0	0	2	0	0	0	0	0	0	0	0	2	0			
Peak Hour	0	0	0	1	0	0	0	0	0	0	0	0	1	0			

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

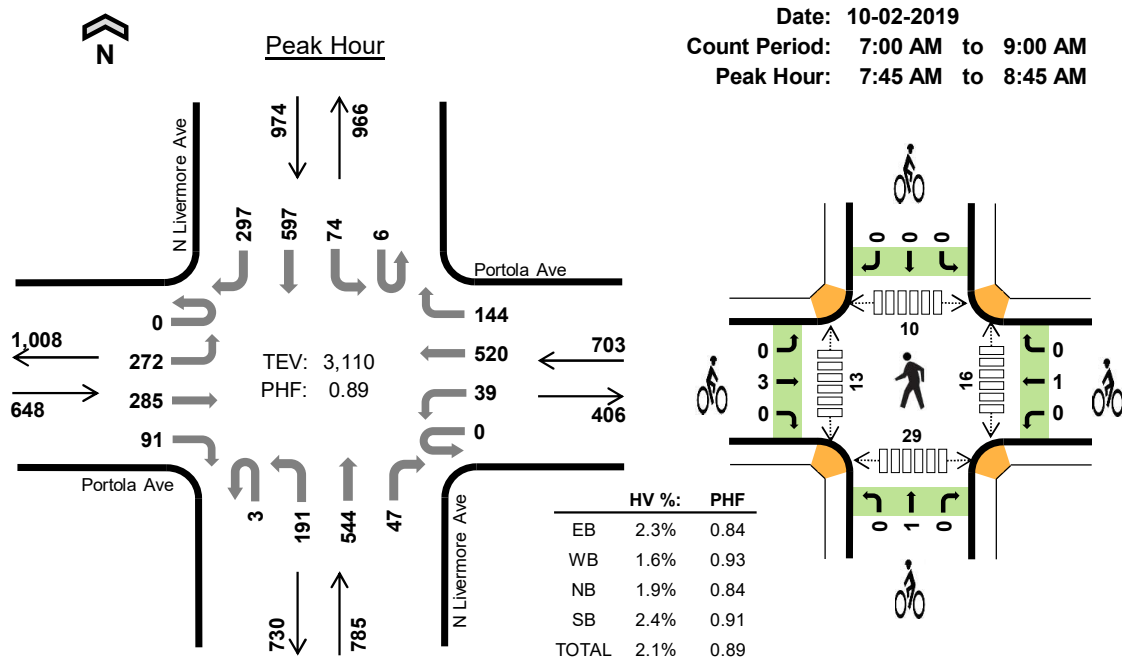


Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	Las Positas Ct				Las Positas Rd				N Livermore Ave				N Livermore Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	1	0	3	0	0	1	1	0	1	3	0	10	0
4:15 PM	0	1	0	0	0	1	0	1	0	0	1	1	0	0	3	0	8	0
4:30 PM	0	1	0	0	0	0	0	0	0	0	3	2	0	0	1	0	7	0
4:45 PM	0	0	0	0	0	2	0	1	0	0	1	1	0	0	2	0	7	32
5:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	1	4	26
5:15 PM	0	3	0	0	0	1	0	1	0	1	2	1	0	1	4	0	14	32
5:30 PM	0	1	0	0	0	1	0	1	0	0	1	2	0	0	0	1	7	32
5:45 PM	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	1	4	29
Count Total	0	6	1	0	0	7	0	7	0	1	10	8	0	3	15	3	61	0
Peak Hour	0	4	1	0	0	3	0	2	0	1	6	4	0	2	8	1	32	0

Two-Hour Count Summaries - Bikes																	
Interval Start	Las Positas Ct			Las Positas Rd			N Livermore Ave			N Livermore Ave			15-min Total	Rolling One Hour			
	Eastbound			Westbound			Northbound			Southbound							
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT					
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
4:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	0			
4:45 PM	0	0	0	0	0	0	0	0	0	0	1	0	1	2			
5:00 PM	0	0	0	0	0	0	0	0	1	0	0	0	1	3			
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3			
5:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	1	3			
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2			
Count Total	0	0	0	1	0	0	0	1	1	0	1	0	4	0			
Peak Hour	0	0	0	0	0	0	0	1	1	0	1	0	3	0			

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

# N Livermore Ave Portola Ave



## Two-Hour Count Summaries

Interval Start		Portola Ave				Portola Ave				N Livermore Ave				N Livermore Ave				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	36	30	15	0	9	50	34	0	15	110	2	0	8	65	42	416	0
7:15 AM		0	43	56	22	0	5	112	39	0	38	131	7	1	9	82	40	585	0
7:30 AM		0	55	47	37	0	9	105	30	0	55	104	3	0	17	109	66	637	0
7:45 AM		0	75	57	28	0	8	142	19	1	61	121	4	1	11	159	73	760	2,398
8:00 AM		0	54	69	29	0	5	119	36	0	43	130	15	2	18	155	64	739	2,721
8:15 AM		0	71	95	26	0	13	123	48	1	56	159	18	1	33	149	84	877	3,013
8:30 AM		0	72	64	8	0	13	136	41	1	31	134	10	2	12	134	76	734	3,110
8:45 AM		0	73	53	15	0	5	121	30	2	38	135	3	1	10	162	79	727	3,077
Count Total		0	479	471	180	0	67	908	277	5	337	1,024	62	8	118	1,015	524	5,475	0
Peak Hour	All	0	272	285	91	0	39	520	144	3	191	544	47	6	74	597	297	3,110	0
	HV	0	3	8	4	0	2	6	3	0	4	11	0	0	2	19	2	64	0
	HV%	-	1%	3%	4%	-	5%	1%	2%	0%	2%	2%	0%	0%	3%	3%	1%	2%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	1	1	6	2	10	1	0	0	0	1	0	1	0	2	3
7:15 AM	1	1	2	5	9	1	0	1	0	2	1	1	0	1	3
7:30 AM	2	3	7	5	17	1	0	0	0	1	1	1	1	0	3
7:45 AM	3	1	2	5	11	1	1	0	0	2	0	3	0	2	5
8:00 AM	3	5	7	4	19	1	0	1	0	2	2	3	0	2	7
8:15 AM	3	4	3	10	20	0	0	0	0	0	7	2	6	14	29
8:30 AM	6	1	3	4	14	1	0	0	0	1	7	5	4	11	27
8:45 AM	2	3	7	8	20	1	0	0	0	1	0	4	0	1	5
Count Total	21	19	37	43	120	7	1	2	0	10	18	20	11	33	82
Peak Hour	15	11	15	23	64	3	1	1	0	5	16	13	10	29	68

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	Portola Ave				Portola Ave				N Livermore Ave				N Livermore Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	1	0	0	1	0	0	2	4	0	0	0	1	1	10	0
7:15 AM	0	0	0	1	0	0	1	0	0	0	1	1	0	0	4	1	9	0
7:30 AM	0	1	0	1	0	0	3	0	0	3	4	0	0	0	2	3	17	0
7:45 AM	0	0	2	1	0	1	0	0	0	0	2	0	0	0	5	0	11	47
8:00 AM	0	1	1	1	0	1	2	2	0	2	5	0	0	0	3	1	19	56
8:15 AM	0	1	1	1	0	0	4	0	0	2	1	0	0	2	7	1	20	67
8:30 AM	0	1	4	1	0	0	0	1	0	0	3	0	0	0	4	0	14	64
8:45 AM	0	1	0	1	0	0	3	0	0	3	4	0	0	0	6	2	20	73
Count Total	0	5	8	8	0	2	14	3	0	12	24	1	0	2	32	9	120	0
Peak Hour	0	3	8	4	0	2	6	3	0	4	11	0	0	2	19	2	64	0

Two-Hour Count Summaries - Bikes																		
Interval Start	Portola Ave			Portola Ave			N Livermore Ave			N Livermore Ave			15-min Total	Rolling One Hour				
	Eastbound			Westbound			Northbound			Southbound								
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT						
7:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	1	0				
7:15 AM	0	1	0	0	0	0	0	1	0	0	0	0	2	0				
7:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	1	0				
7:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	2	6				
8:00 AM	0	1	0	0	0	0	0	1	0	0	0	0	2	7				
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	5				
8:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	1	5				
8:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	1	4				
Count Total	0	7	0	0	1	0	0	2	0	0	0	0	10	0				
Peak Hour	0	3	0	0	1	0	0	1	0	0	0	0	5	0				

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

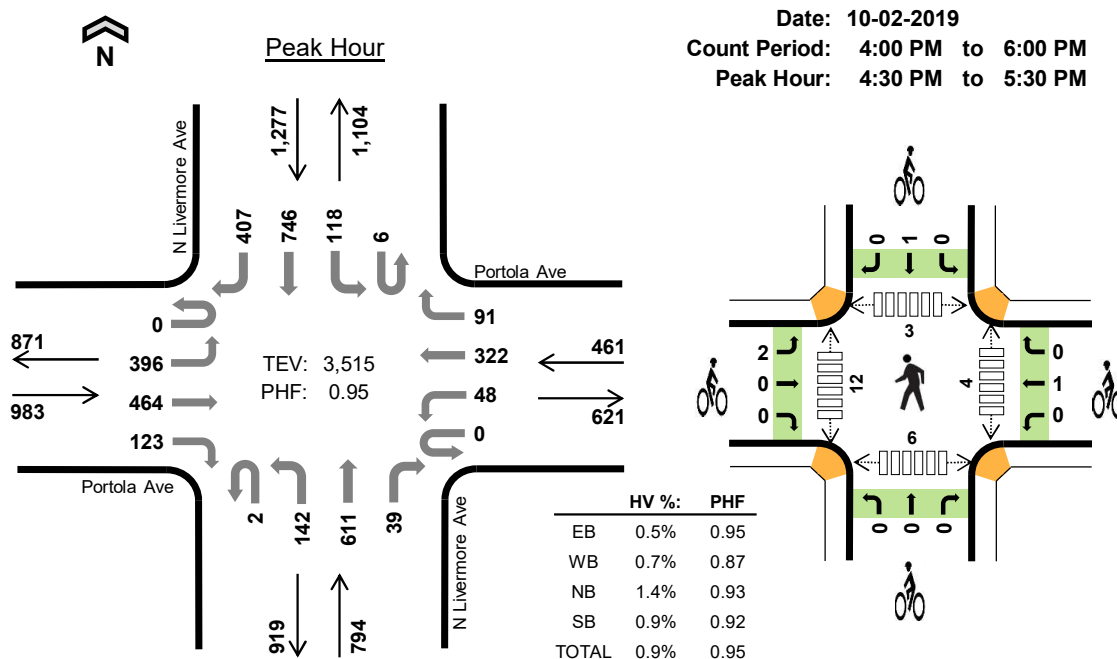
# N Livermore Ave Portola Ave



Date: 10-02-2019

Count Period: 4:00 PM to 6:00 PM

Peak Hour: 4:30 PM to 5:30 PM



## Two-Hour Count Summaries

Interval Start		Portola Ave				Portola Ave				N Livermore Ave				N Livermore Ave				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	114	80	25	0	7	67	30	0	27	122	16	1	27	162	106	784	0
4:15 PM		0	94	118	34	0	7	74	21	0	19	132	7	2	37	174	105	824	0
4:30 PM		0	100	113	28	0	10	80	17	0	33	166	6	1	33	174	87	848	0
4:45 PM		0	96	101	33	0	12	80	31	0	39	151	14	1	27	180	101	866	3,322
5:00 PM		0	108	115	35	0	13	65	20	0	33	127	11	2	32	199	113	873	3,411
5:15 PM		0	92	135	27	0	13	97	23	2	37	167	8	2	26	193	106	928	3,515
5:30 PM		0	69	96	30	0	15	83	21	0	34	119	11	2	49	205	96	830	3,497
5:45 PM		0	91	94	29	0	9	75	11	0	40	146	6	0	38	200	66	805	3,436
Count Total		0	764	852	241	0	86	621	174	2	262	1,130	79	11	269	1,487	780	6,758	0
Peak Hour	All	0	396	464	123	0	48	322	91	2	142	611	39	6	118	746	407	3,515	0
	HV	0	0	1	4	0	0	3	0	0	5	5	1	0	1	9	1	30	0
	HV%	-	0%	0%	3%	-	0%	1%	0%	0%	4%	1%	3%	0%	1%	1%	0%	1%	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	1	0	3	2	6	0	2	0	0	2	0	3	3	0	6
4:15 PM	3	0	2	4	9	0	0	0	0	0	4	2	3	5	14
4:30 PM	2	0	4	1	7	1	0	0	0	1	1	4	0	3	8
4:45 PM	1	1	2	3	7	0	1	0	0	1	2	1	2	1	6
5:00 PM	1	2	2	3	8	1	0	0	1	2	1	2	1	2	6
5:15 PM	1	0	3	4	8	0	0	0	0	0	0	5	0	0	5
5:30 PM	1	0	3	0	4	0	1	0	0	1	4	0	5	1	10
5:45 PM	1	0	3	2	6	0	0	1	0	1	3	6	3	2	14
Count Total	11	3	22	19	55	2	4	1	1	8	15	23	17	14	69
Peak Hour	5	3	11	11	30	2	1	0	1	4	4	12	3	6	25



Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	Portola Ave				Portola Ave				N Livermore Ave				N Livermore Ave				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	1	0	0	0	0	0	1	2	0	0	1	0	1	6	0
4:15 PM	0	1	0	2	0	0	0	0	0	1	1	0	0	0	3	1	9	0
4:30 PM	0	0	1	1	0	0	0	0	0	1	3	0	0	0	1	0	7	0
4:45 PM	0	0	0	1	0	0	1	0	0	1	0	1	0	0	3	0	7	29
5:00 PM	0	0	0	1	0	0	2	0	0	1	1	0	0	0	2	1	8	31
5:15 PM	0	0	0	1	0	0	0	0	0	2	1	0	0	1	3	0	8	30
5:30 PM	0	0	0	1	0	0	0	0	0	1	2	0	0	0	0	0	4	27
5:45 PM	0	0	0	1	0	0	0	0	0	2	1	0	0	0	2	0	6	26
Count Total	0	1	1	9	0	0	3	0	0	10	11	1	0	2	14	3	55	0
Peak Hour	0	0	1	4	0	0	3	0	0	5	5	1	0	1	9	1	30	0

Two-Hour Count Summaries - Bikes																	
Interval Start	Portola Ave			Portola Ave			N Livermore Ave			N Livermore Ave			15-min Total	Rolling One Hour			
	Eastbound			Westbound			Northbound			Southbound							
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT					
4:00 PM	0	0	0	0	2	0	0	0	0	0	0	0	2	0			
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
4:30 PM	1	0	0	0	0	0	0	0	0	0	0	0	1	0			
4:45 PM	0	0	0	0	1	0	0	0	0	0	0	0	1	4			
5:00 PM	1	0	0	0	0	0	0	0	0	0	0	0	2	4			
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	4			
5:30 PM	0	0	0	0	1	0	0	0	0	0	0	0	1	4			
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	4			
Count Total	2	0	0	0	4	0	0	1	0	0	1	0	8	0			
Peak Hour	2	0	0	0	1	0	0	0	0	0	1	0	4	0			

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

## Vehicle Classification Report Summary



**Location:** N Livermore Ave, B/W Arroyo Plaza Rd & Las Positas Rd  
**Count Direction:** Northbound / Southbound  
**Date Range:** 10/2/2019 to 10/3/2019  
**Site Code:** 01

	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
Study Total														
Northbound	207	18,720	5,058	24	1,650	605	0	41	139	133	2	2	88	26,669
Percent	0.8%	70.2%	19.0%	0.1%	6.2%	2.3%	0.0%	0.2%	0.5%	0.5%	0.0%	0.0%	0.3%	100%
Southbound	128	20,491	5,253	28	2,088	110	0	49	86	45	2	0	25	28,305
Percent	0.5%	72.4%	18.6%	0.1%	7.4%	0.4%	0.0%	0.2%	0.3%	0.2%	0.0%	0.0%	0.1%	100%
Total	335	39,211	10,311	52	3,738	715	0	90	225	178	4	2	113	54,974
Percent	0.6%	71.3%	18.8%	0.1%	6.8%	1.3%	0.0%	0.2%	0.4%	0.3%	0.0%	0.0%	0.2%	100%

### FHWA Vehicle Classification

Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks
Class 7 - Four or More Axle Single-Unit Trucks	

**Location:** N Livermore Ave, B/W Arroyo Plaza Rd & Las Positas Rd  
**Date Range:** 10/2/2019 to 10/3/2019  
**Site Code:** 01

**Wednesday, October 2, 2019**  
**Northbound**

Time	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
12:00 AM	1	66	17	0	3	5	0	0	2	0	0	0	1	95
1:00 AM	0	36	11	0	5	3	0	0	1	0	0	0	0	56
2:00 AM	1	32	13	0	3	2	0	0	0	0	0	0	0	51
3:00 AM	1	51	25	1	9	9	0	1	3	1	0	0	0	101
4:00 AM	1	133	47	0	22	9	0	1	4	3	0	0	0	220
5:00 AM	1	226	95	0	44	17	0	0	1	0	0	0	0	384
6:00 AM	9	371	131	0	49	23	0	0	8	5	0	0	3	599
7:00 AM	6	585	168	3	66	26	0	2	4	3	0	0	4	867
8:00 AM	7	518	174	1	63	22	0	0	5	6	0	0	10	806
9:00 AM	2	414	117	0	58	22	0	0	8	2	0	0	3	626
10:00 AM	6	447	136	0	50	7	0	1	3	4	0	0	1	655
11:00 AM	9	525	155	0	54	15	0	1	1	8	0	0	2	770
12:00 PM	3	552	139	0	50	11	0	2	4	1	0	0	4	766
1:00 PM	9	609	159	3	46	6	0	1	4	3	0	0	4	844
2:00 PM	6	570	197	0	50	16	0	1	5	4	0	0	3	852
3:00 PM	6	637	169	0	49	24	0	1	3	5	1	0	3	898
4:00 PM	8	693	161	1	45	15	0	1	2	2	0	0	1	929
5:00 PM	5	600	157	1	33	16	0	2	1	5	0	0	4	824
6:00 PM	8	547	117	0	37	13	0	1	1	2	0	0	0	726
7:00 PM	2	509	110	0	30	11	0	1	2	0	1	0	1	667
8:00 PM	1	400	98	0	28	11	0	0	2	3	0	0	1	544
9:00 PM	3	376	87	0	24	14	0	0	4	6	0	0	0	514
10:00 PM	1	238	62	0	14	9	0	0	0	0	0	0	0	324
11:00 PM	0	103	22	0	7	6	0	1	1	1	0	0	0	141
<b>Total</b>	<b>96</b>	<b>9,238</b>	<b>2,567</b>	<b>10</b>	<b>839</b>	<b>312</b>	<b>0</b>	<b>17</b>	<b>69</b>	<b>64</b>	<b>2</b>	<b>0</b>	<b>45</b>	<b>13,259</b>
<b>Percent</b>	<b>0.7%</b>	<b>69.7%</b>	<b>19.4%</b>	<b>0.1%</b>	<b>6.3%</b>	<b>2.4%</b>	<b>0.0%</b>	<b>0.1%</b>	<b>0.5%</b>	<b>0.5%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.3%</b>	

**Location:** N Livermore Ave, B/W Arroyo Plaza Rd & Las Positas Rd  
**Date Range:** 10/2/2019 to 10/3/2019  
**Site Code:** 01

**Wednesday, October 2, 2019**  
**Southbound**

Time	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
12:00 AM	0	110	14	0	3	0	0	0	0	0	0	0	0	127
1:00 AM	0	49	8	0	2	0	0	0	0	0	0	0	0	59
2:00 AM	0	42	11	0	3	0	0	0	2	0	0	0	0	58
3:00 AM	0	56	12	0	6	0	0	1	8	0	0	0	0	83
4:00 AM	0	70	25	1	15	2	0	1	6	1	0	0	0	121
5:00 AM	0	128	40	0	23	0	0	0	3	0	0	0	0	194
6:00 AM	0	236	74	2	63	2	0	0	2	0	0	0	1	380
7:00 AM	1	529	136	1	59	3	0	2	3	2	0	0	0	736
8:00 AM	4	654	231	0	81	6	0	0	3	1	0	0	1	981
9:00 AM	2	550	163	1	67	1	0	0	4	3	0	0	1	792
10:00 AM	6	505	166	1	79	0	0	5	0	1	0	0	0	763
11:00 AM	3	574	164	0	79	5	0	2	1	3	0	0	1	832
12:00 PM	4	599	158	0	75	2	0	1	3	1	0	0	0	843
1:00 PM	7	647	192	1	76	3	0	2	4	0	0	0	0	932
2:00 PM	6	621	197	0	71	5	0	3	1	2	0	0	0	906
3:00 PM	7	661	181	1	65	7	0	0	0	2	0	0	2	926
4:00 PM	5	750	193	0	73	1	0	0	3	2	0	0	2	1,029
5:00 PM	5	834	204	1	56	5	0	1	2	2	0	0	1	1,111
6:00 PM	7	712	176	1	48	6	0	1	2	3	0	0	0	956
7:00 PM	3	605	142	0	34	4	0	1	1	0	0	0	0	790
8:00 PM	3	469	116	1	24	0	0	0	0	0	0	0	0	613
9:00 PM	1	428	80	0	30	2	0	1	0	0	0	0	0	542
10:00 PM	0	287	60	0	7	1	0	0	0	0	0	0	0	355
11:00 PM	1	147	19	0	8	1	0	1	1	0	0	0	0	178
<b>Total</b>	<b>65</b>	<b>10,263</b>	<b>2,762</b>	<b>11</b>	<b>1,047</b>	<b>56</b>	<b>0</b>	<b>22</b>	<b>49</b>	<b>23</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>14,307</b>
<b>Percent</b>	<b>0.5%</b>	<b>71.7%</b>	<b>19.3%</b>	<b>0.1%</b>	<b>7.3%</b>	<b>0.4%</b>	<b>0.0%</b>	<b>0.2%</b>	<b>0.3%</b>	<b>0.2%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.1%</b>	

**Location:** N Livermore Ave, B/W Arroyo Plaza Rd & Las Positas Rd  
**Date Range:** 10/2/2019 to 10/3/2019  
**Site Code:** 01

**Thursday, October 3, 2019**  
**Northbound**

Time	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
12:00 AM	1	79	18	0	3	2	0	0	3	0	0	0	0	106
1:00 AM	1	42	9	0	4	2	0	0	2	0	0	0	0	60
2:00 AM	0	45	16	0	6	0	0	0	0	0	0	0	0	67
3:00 AM	1	46	21	0	6	6	0	0	2	0	0	0	0	82
4:00 AM	1	124	57	0	24	13	0	0	1	0	0	0	2	222
5:00 AM	6	211	98	2	40	11	0	1	4	3	0	0	2	378
6:00 AM	5	430	138	1	55	18	0	2	3	5	0	0	3	660
7:00 AM	10	557	147	1	65	21	0	0	5	5	0	0	3	814
8:00 AM	5	539	166	3	50	23	0	1	3	7	0	0	3	800
9:00 AM	5	465	128	0	52	19	0	0	5	5	0	0	1	680
10:00 AM	8	493	159	0	46	24	0	4	2	3	0	1	1	741
11:00 AM	6	504	142	2	50	16	0	2	3	1	0	1	2	729
12:00 PM	9	595	136	0	47	17	0	2	6	4	0	0	6	822
1:00 PM	6	570	128	3	44	10	0	2	2	4	0	0	2	771
2:00 PM	12	573	148	0	48	13	0	1	3	6	0	0	2	806
3:00 PM	8	621	159	0	48	21	0	3	4	5	0	0	7	876
4:00 PM	5	657	169	0	49	13	0	2	4	2	0	0	0	901
5:00 PM	1	681	145	0	38	14	0	0	3	3	0	0	1	886
6:00 PM	5	554	130	0	38	11	0	2	4	7	0	0	2	753
7:00 PM	4	519	126	1	41	16	0	1	5	3	0	0	2	718
8:00 PM	3	475	102	0	20	10	0	0	2	2	0	0	1	615
9:00 PM	7	374	83	0	19	9	0	0	2	4	0	0	2	500
10:00 PM	1	196	44	1	7	2	0	0	1	0	0	0	1	253
11:00 PM	1	132	22	0	11	2	0	1	1	0	0	0	0	170
<b>Total</b>	<b>111</b>	<b>9,482</b>	<b>2,491</b>	<b>14</b>	<b>811</b>	<b>293</b>	<b>0</b>	<b>24</b>	<b>70</b>	<b>69</b>	<b>0</b>	<b>2</b>	<b>43</b>	<b>13,410</b>
<b>Percent</b>	<b>0.8%</b>	<b>70.7%</b>	<b>18.6%</b>	<b>0.1%</b>	<b>6.0%</b>	<b>2.2%</b>	<b>0.0%</b>	<b>0.2%</b>	<b>0.5%</b>	<b>0.5%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.3%</b>	

Location: N Livermore Ave, B/W Arroyo Plaza Rd & Las Positas Rd  
 Date Range: 10/2/2019 to 10/3/2019  
 Site Code: 01

Thursday, October 3, 2019  
 Southbound

Time	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
12:00 AM	1	114	21	0	6	0	0	0	1	0	0	0	0	143
1:00 AM	0	43	4	0	7	0	0	0	0	0	0	0	0	54
2:00 AM	0	46	2	0	4	0	0	0	0	0	0	0	0	52
3:00 AM	2	59	13	0	3	1	0	0	4	0	0	0	0	82
4:00 AM	1	73	24	1	19	0	0	2	1	0	0	0	0	121
5:00 AM	0	122	49	0	30	0	0	0	2	0	0	0	0	203
6:00 AM	4	218	72	1	59	1	0	1	0	0	0	0	1	357
7:00 AM	3	538	118	3	72	3	0	2	0	0	0	0	0	739
8:00 AM	3	618	182	1	60	5	0	2	1	0	0	0	1	873
9:00 AM	2	537	164	0	63	5	0	0	0	0	1	0	0	772
10:00 AM	3	499	151	1	62	3	0	2	2	0	0	0	0	723
11:00 AM	3	615	150	3	65	2	0	2	4	1	0	0	0	845
12:00 PM	4	654	158	1	63	7	0	1	1	2	0	0	4	895
1:00 PM	6	678	166	2	71	4	0	0	2	4	0	0	1	934
2:00 PM	5	622	191	1	82	4	0	2	3	5	1	0	1	917
3:00 PM	6	583	175	0	72	5	0	4	2	1	0	0	2	850
4:00 PM	5	708	186	0	60	4	0	1	4	3	0	0	1	972
5:00 PM	2	851	151	0	70	2	0	2	2	3	0	0	5	1,088
6:00 PM	6	759	161	1	55	2	0	4	2	3	0	0	0	993
7:00 PM	2	605	115	1	48	1	0	1	3	0	0	0	0	776
8:00 PM	2	437	82	1	23	3	0	0	1	0	0	0	0	549
9:00 PM	1	414	88	0	19	0	0	0	1	0	0	0	0	523
10:00 PM	0	264	40	0	16	1	0	0	0	0	0	0	0	321
11:00 PM	2	171	28	0	12	1	0	1	1	0	0	0	0	216
<b>Total</b>	<b>63</b>	<b>10,228</b>	<b>2,491</b>	<b>17</b>	<b>1,041</b>	<b>54</b>	<b>0</b>	<b>27</b>	<b>37</b>	<b>22</b>	<b>2</b>	<b>0</b>	<b>16</b>	<b>13,998</b>
<b>Percent</b>	<b>0.5%</b>	<b>73.1%</b>	<b>17.8%</b>	<b>0.1%</b>	<b>7.4%</b>	<b>0.4%</b>	<b>0.0%</b>	<b>0.2%</b>	<b>0.3%</b>	<b>0.2%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.1%</b>	

**Location:** N Livermore Ave, B/W Arroyo Plaza Rd & Las Positas Rd  
**Date Range:** 10/2/2019 to 10/3/2019  
**Site Code:** 01

**Total Study Average**  
**Northbound**

Time	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
12:00 AM	1	73	18	0	3	4	0	0	3	0	0	0	1	103
1:00 AM	1	39	10	0	5	3	0	0	2	0	0	0	0	60
2:00 AM	1	39	15	0	5	1	0	0	0	0	0	0	0	61
3:00 AM	1	49	23	1	8	8	0	1	3	1	0	0	0	95
4:00 AM	1	129	52	0	23	11	0	1	3	2	0	0	1	223
5:00 AM	4	219	97	1	42	14	0	1	3	2	0	0	1	384
6:00 AM	7	401	135	1	52	21	0	1	6	5	0	0	3	632
7:00 AM	8	571	158	2	66	24	0	1	5	4	0	0	4	843
8:00 AM	6	529	170	2	57	23	0	1	4	7	0	0	7	806
9:00 AM	4	440	123	0	55	21	0	0	7	4	0	0	2	656
10:00 AM	7	470	148	0	48	16	0	3	3	4	0	1	1	701
11:00 AM	8	515	149	1	52	16	0	2	2	5	0	1	2	753
12:00 PM	6	574	138	0	49	14	0	2	5	3	0	0	5	796
1:00 PM	8	590	144	3	45	8	0	2	3	4	0	0	3	810
2:00 PM	9	572	173	0	49	15	0	1	4	5	0	0	3	831
3:00 PM	7	629	164	0	49	23	0	2	4	5	1	0	5	889
4:00 PM	7	675	165	1	47	14	0	2	3	2	0	0	1	917
5:00 PM	3	641	151	1	36	15	0	1	2	4	0	0	3	857
6:00 PM	7	551	124	0	38	12	0	2	3	5	0	0	1	743
7:00 PM	3	514	118	1	36	14	0	1	4	2	1	0	2	696
8:00 PM	2	438	100	0	24	11	0	0	2	3	0	0	1	581
9:00 PM	5	375	85	0	22	12	0	0	3	5	0	0	1	508
10:00 PM	1	217	53	1	11	6	0	0	1	0	0	0	1	291
11:00 PM	1	118	22	0	9	4	0	1	1	1	0	0	0	157
<b>Total</b>	<b>108</b>	<b>9,368</b>	<b>2,535</b>	<b>15</b>	<b>831</b>	<b>310</b>	<b>0</b>	<b>25</b>	<b>76</b>	<b>73</b>	<b>2</b>	<b>2</b>	<b>48</b>	<b>13,393</b>
<b>Percent</b>	<b>0.8%</b>	<b>69.9%</b>	<b>18.9%</b>	<b>0.1%</b>	<b>6.2%</b>	<b>2.3%</b>	<b>0.0%</b>	<b>0.2%</b>	<b>0.6%</b>	<b>0.5%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.4%</b>	

Note: Average only considered on days with 24-hours of data.

**Location:** N Livermore Ave, B/W Arroyo Plaza Rd & Las Positas Rd  
**Date Range:** 10/2/2019 to 10/3/2019  
**Site Code:** 01

**Total Study Average**  
**Southbound**

Time	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
12:00 AM	1	112	18	0	5	0	0	0	1	0	0	0	0	137
1:00 AM	0	46	6	0	5	0	0	0	0	0	0	0	0	57
2:00 AM	0	44	7	0	4	0	0	0	1	0	0	0	0	56
3:00 AM	1	58	13	0	5	1	0	1	6	0	0	0	0	85
4:00 AM	1	72	25	1	17	1	0	2	4	1	0	0	0	124
5:00 AM	0	125	45	0	27	0	0	0	3	0	0	0	0	200
6:00 AM	2	227	73	2	61	2	0	1	1	0	0	0	1	370
7:00 AM	2	534	127	2	66	3	0	2	2	1	0	0	0	739
8:00 AM	4	636	207	1	71	6	0	1	2	1	0	0	1	930
9:00 AM	2	544	164	1	65	3	0	0	2	2	1	0	1	785
10:00 AM	5	502	159	1	71	2	0	4	1	1	0	0	0	746
11:00 AM	3	595	157	2	72	4	0	2	3	2	0	0	1	841
12:00 PM	4	627	158	1	69	5	0	1	2	2	0	0	2	871
1:00 PM	7	663	179	2	74	4	0	1	3	2	0	0	1	936
2:00 PM	6	622	194	1	77	5	0	3	2	4	1	0	1	916
3:00 PM	7	622	178	1	69	6	0	2	1	2	0	0	2	890
4:00 PM	5	729	190	0	67	3	0	1	4	3	0	0	2	1,004
5:00 PM	4	843	178	1	63	4	0	2	2	3	0	0	3	1,103
6:00 PM	7	736	169	1	52	4	0	3	2	3	0	0	0	977
7:00 PM	3	605	129	1	41	3	0	1	2	0	0	0	0	785
8:00 PM	3	453	99	1	24	2	0	0	1	0	0	0	0	583
9:00 PM	1	421	84	0	25	1	0	1	1	0	0	0	0	534
10:00 PM	0	276	50	0	12	1	0	0	0	0	0	0	0	339
11:00 PM	2	159	24	0	10	1	0	1	1	0	0	0	0	198
<b>Total</b>	<b>70</b>	<b>10,251</b>	<b>2,633</b>	<b>19</b>	<b>1,052</b>	<b>61</b>	<b>0</b>	<b>29</b>	<b>47</b>	<b>27</b>	<b>2</b>	<b>0</b>	<b>15</b>	<b>14,206</b>
<b>Percent</b>	<b>0.5%</b>	<b>72.2%</b>	<b>18.5%</b>	<b>0.1%</b>	<b>7.4%</b>	<b>0.4%</b>	<b>0.0%</b>	<b>0.2%</b>	<b>0.3%</b>	<b>0.2%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.1%</b>	

Note: Average only considered on days with 24-hours of data.



**Location:** N Livermore Ave, B/W Arroyo Plaza Rd & Las Positas Rd  
**Date Range:** 10/2/2019 to 10/3/2019  
**Site Code:** 01

**3-Day (Tuesday - Thursday) Average**  
**Northbound**

Time	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
12:00 AM	1	73	18	0	3	4	0	0	3	0	0	0	1	103
1:00 AM	1	39	10	0	5	3	0	0	2	0	0	0	0	60
2:00 AM	1	39	15	0	5	1	0	0	0	0	0	0	0	61
3:00 AM	1	49	23	1	8	8	0	1	3	1	0	0	0	95
4:00 AM	1	129	52	0	23	11	0	1	3	2	0	0	1	223
5:00 AM	4	219	97	1	42	14	0	1	3	2	0	0	1	384
6:00 AM	7	401	135	1	52	21	0	1	6	5	0	0	3	632
7:00 AM	8	571	158	2	66	24	0	1	5	4	0	0	4	843
8:00 AM	6	529	170	2	57	23	0	1	4	7	0	0	7	806
9:00 AM	4	440	123	0	55	21	0	0	7	4	0	0	2	656
10:00 AM	7	470	148	0	48	16	0	3	3	4	0	1	1	701
11:00 AM	8	515	149	1	52	16	0	2	2	5	0	1	2	753
12:00 PM	6	574	138	0	49	14	0	2	5	3	0	0	5	796
1:00 PM	8	590	144	3	45	8	0	2	3	4	0	0	3	810
2:00 PM	9	572	173	0	49	15	0	1	4	5	0	0	3	831
3:00 PM	7	629	164	0	49	23	0	2	4	5	1	0	5	889
4:00 PM	7	675	165	1	47	14	0	2	3	2	0	0	1	917
5:00 PM	3	641	151	1	36	15	0	1	2	4	0	0	3	857
6:00 PM	7	551	124	0	38	12	0	2	3	5	0	0	1	743
7:00 PM	3	514	118	1	36	14	0	1	4	2	1	0	2	696
8:00 PM	2	438	100	0	24	11	0	0	2	3	0	0	1	581
9:00 PM	5	375	85	0	22	12	0	0	3	5	0	0	1	508
10:00 PM	1	217	53	1	11	6	0	0	1	0	0	0	1	291
11:00 PM	1	118	22	0	9	4	0	1	1	1	0	0	0	157
<b>Total</b>	<b>108</b>	<b>9,368</b>	<b>2,535</b>	<b>15</b>	<b>831</b>	<b>310</b>	<b>0</b>	<b>25</b>	<b>76</b>	<b>73</b>	<b>2</b>	<b>2</b>	<b>48</b>	<b>13,393</b>
<b>Percent</b>	<b>0.8%</b>	<b>69.9%</b>	<b>18.9%</b>	<b>0.1%</b>	<b>6.2%</b>	<b>2.3%</b>	<b>0.0%</b>	<b>0.2%</b>	<b>0.6%</b>	<b>0.5%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.4%</b>	

**Location:** N Livermore Ave, B/W Arroyo Plaza Rd & Las Positas Rd  
**Date Range:** 10/2/2019 to 10/3/2019  
**Site Code:** 01

**3-Day (Tuesday - Thursday) Average**  
**Southbound**

Time	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
12:00 AM	1	112	18	0	5	0	0	0	1	0	0	0	0	137
1:00 AM	0	46	6	0	5	0	0	0	0	0	0	0	0	57
2:00 AM	0	44	7	0	4	0	0	0	1	0	0	0	0	56
3:00 AM	1	58	13	0	5	1	0	1	6	0	0	0	0	85
4:00 AM	1	72	25	1	17	1	0	2	4	1	0	0	0	124
5:00 AM	0	125	45	0	27	0	0	0	3	0	0	0	0	200
6:00 AM	2	227	73	2	61	2	0	1	1	0	0	0	1	370
7:00 AM	2	534	127	2	66	3	0	2	2	1	0	0	0	739
8:00 AM	4	636	207	1	71	6	0	1	2	1	0	0	1	930
9:00 AM	2	544	164	1	65	3	0	0	2	2	1	0	1	785
10:00 AM	5	502	159	1	71	2	0	4	1	1	0	0	0	746
11:00 AM	3	595	157	2	72	4	0	2	3	2	0	0	1	841
12:00 PM	4	627	158	1	69	5	0	1	2	2	0	0	2	871
1:00 PM	7	663	179	2	74	4	0	1	3	2	0	0	1	936
2:00 PM	6	622	194	1	77	5	0	3	2	4	1	0	1	916
3:00 PM	7	622	178	1	69	6	0	2	1	2	0	0	2	890
4:00 PM	5	729	190	0	67	3	0	1	4	3	0	0	2	1,004
5:00 PM	4	843	178	1	63	4	0	2	2	3	0	0	3	1,103
6:00 PM	7	736	169	1	52	4	0	3	2	3	0	0	0	977
7:00 PM	3	605	129	1	41	3	0	1	2	0	0	0	0	785
8:00 PM	3	453	99	1	24	2	0	0	1	0	0	0	0	583
9:00 PM	1	421	84	0	25	1	0	1	1	0	0	0	0	534
10:00 PM	0	276	50	0	12	1	0	0	0	0	0	0	0	339
11:00 PM	2	159	24	0	10	1	0	1	1	0	0	0	0	198
<b>Total</b>	<b>70</b>	<b>10,251</b>	<b>2,633</b>	<b>19</b>	<b>1,052</b>	<b>61</b>	<b>0</b>	<b>29</b>	<b>47</b>	<b>27</b>	<b>2</b>	<b>0</b>	<b>15</b>	<b>14,206</b>
<b>Percent</b>	<b>0.5%</b>	<b>72.2%</b>	<b>18.5%</b>	<b>0.1%</b>	<b>7.4%</b>	<b>0.4%</b>	<b>0.0%</b>	<b>0.2%</b>	<b>0.3%</b>	<b>0.2%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.1%</b>	

## Vehicle Speed Report Summary



**Location:** N Livermore Ave, B/W Arroyo Plaza Rd & Las Positas Rd  
**Count Direction:** Northbound / Southbound  
**Date Range:** 10/2/2019 to 10/3/2019  
**Site Code:** 01

	Speed Range (mph)																	Total Volume
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	
Study Total																		
Northbound	317	1,700	4,039	4,889	4,890	5,574	3,720	1,180	290	56	12	2	0	0	0	0	0	26,669
Percent	1.2%	6.4%	15.1%	18.3%	18.3%	20.9%	13.9%	4.4%	1.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%
Southbound	181	806	2,169	5,103	7,144	6,406	4,299	1,706	389	87	9	5	1	0	0	0	0	28,305
Percent	0.6%	2.8%	7.7%	18.0%	25.2%	22.6%	15.2%	6.0%	1.4%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%
Total	498	2,506	6,208	9,992	12,034	11,980	8,019	2,886	679	143	21	7	1	0	0	0	0	54,974
Percent	0.9%	4.6%	11.3%	18.2%	21.9%	21.8%	14.6%	5.2%	1.2%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Total Study Percentile Speed Summary			Total Study Speed Statistics		
<b>Northbound</b>			<b>Northbound</b>		
50th Percentile (Median)	27.5	mph	Mean (Average) Speed	27.3	mph
85th Percentile	36.2	mph	10 mph Pace	26.1 - 36.1	mph
95th Percentile	40.5	mph	Percent in Pace	39.4	%
<b>Southbound</b>			<b>Southbound</b>		
50th Percentile (Median)	29.1	mph	Mean (Average) Speed	29.2	mph
85th Percentile	37.1	mph	10 mph Pace	24.3 - 34.3	mph
95th Percentile	41.6	mph	Percent in Pace	48.1	%

Location: N Livermore Ave, B/W Arroyo Plaza Rd & Las Positas Rd  
 Date Range: 10/2/2019 to 10/3/2019  
 Site Code: 01

Wednesday, October 2, 2019

Northbound

Time	Speed Range (mph)																	Total Volume
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	
12:00 AM	0	2	8	12	22	17	20	11	3	0	0	0	0	0	0	0	0	95
1:00 AM	0	3	4	7	6	11	11	12	2	0	0	0	0	0	0	0	0	56
2:00 AM	0	1	4	5	7	12	11	8	3	0	0	0	0	0	0	0	0	51
3:00 AM	0	0	7	18	10	18	27	18	3	0	0	0	0	0	0	0	0	101
4:00 AM	0	5	19	20	20	38	55	41	18	4	0	0	0	0	0	0	0	220
5:00 AM	0	9	27	37	21	84	113	64	20	7	2	0	0	0	0	0	0	384
6:00 AM	3	24	54	53	48	132	199	53	28	3	1	1	0	0	0	0	0	599
7:00 AM	6	27	82	60	138	268	209	65	11	1	0	0	0	0	0	0	0	867
8:00 AM	2	14	32	83	193	277	145	51	7	2	0	0	0	0	0	0	0	806
9:00 AM	5	41	78	108	113	150	88	39	1	3	0	0	0	0	0	0	0	626
10:00 AM	11	46	105	132	96	136	99	24	4	2	0	0	0	0	0	0	0	655
11:00 AM	14	55	153	155	137	151	83	20	2	0	0	0	0	0	0	0	0	770
12:00 PM	14	55	138	171	164	120	78	20	6	0	0	0	0	0	0	0	0	766
1:00 PM	11	76	197	188	165	127	55	20	5	0	0	0	0	0	0	0	0	844
2:00 PM	18	83	169	198	201	117	57	7	2	0	0	0	0	0	0	0	0	852
3:00 PM	11	64	184	191	167	183	79	17	1	1	0	0	0	0	0	0	0	898
4:00 PM	9	45	146	201	190	206	110	21	1	0	0	0	0	0	0	0	0	929
5:00 PM	5	61	122	146	159	189	111	29	2	0	0	0	0	0	0	0	0	824
6:00 PM	8	49	103	118	172	169	84	19	2	1	1	0	0	0	0	0	0	726
7:00 PM	9	48	144	160	126	101	63	13	3	0	0	0	0	0	0	0	0	667
8:00 PM	3	33	82	109	114	116	63	20	4	0	0	0	0	0	0	0	0	544
9:00 PM	9	49	81	97	71	96	89	17	4	1	0	0	0	0	0	0	0	514
10:00 PM	2	10	38	70	74	62	52	11	5	0	0	0	0	0	0	0	0	324
11:00 PM	0	4	22	19	21	29	27	13	6	0	0	0	0	0	0	0	0	141
<b>Total</b>	<b>140</b>	<b>804</b>	<b>1,999</b>	<b>2,358</b>	<b>2,435</b>	<b>2,809</b>	<b>1,928</b>	<b>613</b>	<b>143</b>	<b>25</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13,259</b>
<b>Percent</b>	<b>1.1%</b>	<b>6.1%</b>	<b>15.1%</b>	<b>17.8%</b>	<b>18.4%</b>	<b>21.2%</b>	<b>14.5%</b>	<b>4.6%</b>	<b>1.1%</b>	<b>0.2%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>

Daily Percentile Speed Summary		Speed Statistics	
50th Percentile (Median)	27.7 mph	Mean (Average) Speed	27.4 mph
85th Percentile	36.4 mph	10 mph Pace	26.8 - 36.8 mph
95th Percentile	40.6 mph	Percent in Pace	40.1 %

Location: N Livermore Ave, B/W Arroyo Plaza Rd & Las Positas Rd  
 Date Range: 10/2/2019 to 10/3/2019  
 Site Code: 01

Wednesday, October 2, 2019  
 Southbound

Time	Speed Range (mph)																	Total Volume
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	
12:00 AM	0	0	1	17	21	36	27	23	1	1	0	0	0	0	0	0	0	127
1:00 AM	0	0	0	12	14	16	10	4	2	1	0	0	0	0	0	0	0	59
2:00 AM	0	0	2	5	11	10	16	10	3	1	0	0	0	0	0	0	0	58
3:00 AM	0	0	2	6	11	14	32	12	3	3	0	0	0	0	0	0	0	83
4:00 AM	0	1	3	9	15	19	31	34	8	0	1	0	0	0	0	0	0	121
5:00 AM	0	0	1	9	22	51	60	40	8	2	1	0	0	0	0	0	0	194
6:00 AM	0	0	4	16	51	102	117	67	15	7	0	1	0	0	0	0	0	380
7:00 AM	0	2	15	63	118	189	196	118	24	11	0	0	0	0	0	0	0	736
8:00 AM	2	8	31	90	217	253	229	119	26	5	0	1	0	0	0	0	0	981
9:00 AM	0	3	14	71	198	230	189	68	16	3	0	0	0	0	0	0	0	792
10:00 AM	1	1	10	70	162	245	188	69	10	7	0	0	0	0	0	0	0	763
11:00 AM	0	7	46	173	187	185	159	53	19	3	0	0	0	0	0	0	0	832
12:00 PM	0	7	47	159	240	198	134	39	14	4	0	1	0	0	0	0	0	843
1:00 PM	3	14	80	179	262	200	147	40	5	2	0	0	0	0	0	0	0	932
2:00 PM	0	14	55	156	291	235	109	38	6	1	0	1	0	0	0	0	0	906
3:00 PM	0	15	66	187	239	240	116	47	13	3	0	0	0	0	0	0	0	926
4:00 PM	10	46	111	194	292	251	84	32	8	0	1	0	0	0	0	0	0	1,029
5:00 PM	22	70	187	246	330	167	59	23	5	2	0	0	0	0	0	0	0	1,111
6:00 PM	5	21	72	178	292	209	124	42	13	0	0	0	0	0	0	0	0	956
7:00 PM	1	3	28	160	233	209	107	39	9	1	0	0	0	0	0	0	0	790
8:00 PM	0	1	7	130	177	149	121	23	5	0	0	0	0	0	0	0	0	613
9:00 PM	0	0	9	67	119	185	112	42	6	2	0	0	0	0	0	0	0	542
10:00 PM	0	0	6	60	82	103	75	20	7	1	0	0	1	0	0	0	0	355
11:00 PM	0	0	4	25	34	49	41	20	3	2	0	0	0	0	0	0	0	178
<b>Total</b>	<b>44</b>	<b>213</b>	<b>801</b>	<b>2,282</b>	<b>3,618</b>	<b>3,545</b>	<b>2,483</b>	<b>1,022</b>	<b>229</b>	<b>62</b>	<b>3</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14,307</b>
<b>Percent</b>	<b>0.3%</b>	<b>1.5%</b>	<b>5.6%</b>	<b>16.0%</b>	<b>25.3%</b>	<b>24.8%</b>	<b>17.4%</b>	<b>7.1%</b>	<b>1.6%</b>	<b>0.4%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	

Daily Percentile Speed Summary		Speed Statistics	
50th Percentile (Median)	30.3 mph	Mean (Average) Speed	30.4 mph
85th Percentile	37.9 mph	10 mph Pace	25.5 - 35.5 mph
95th Percentile	42.3 mph	Percent in Pace	49.98 %

Location: N Livermore Ave, B/W Arroyo Plaza Rd & Las Positas Rd  
 Date Range: 10/2/2019 to 10/3/2019  
 Site Code: 01

Thursday, October 3, 2019

Northbound

Time	Speed Range (mph)																	Total Volume
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	
12:00 AM	0	3	7	14	17	21	31	11	2	0	0	0	0	0	0	0	0	106
1:00 AM	0	2	6	1	6	16	13	10	4	1	1	0	0	0	0	0	0	60
2:00 AM	0	1	4	0	6	17	15	18	4	2	0	0	0	0	0	0	0	67
3:00 AM	0	2	6	8	5	13	24	16	6	2	0	0	0	0	0	0	0	82
4:00 AM	0	2	20	20	13	36	62	45	17	5	2	0	0	0	0	0	0	222
5:00 AM	1	6	32	37	25	54	122	74	22	5	0	0	0	0	0	0	0	378
6:00 AM	6	24	71	67	101	149	158	63	15	5	1	0	0	0	0	0	0	660
7:00 AM	5	15	63	54	135	251	204	64	17	6	0	0	0	0	0	0	0	814
8:00 AM	10	22	71	60	143	265	172	45	11	0	1	0	0	0	0	0	0	800
9:00 AM	3	37	74	106	104	190	120	36	9	1	0	0	0	0	0	0	0	680
10:00 AM	7	71	137	137	137	155	71	23	2	1	0	0	0	0	0	0	0	741
11:00 AM	13	67	125	150	135	153	62	20	3	1	0	0	0	0	0	0	0	729
12:00 PM	20	86	165	184	165	121	63	17	1	0	0	0	0	0	0	0	0	822
1:00 PM	13	73	160	248	151	88	30	6	2	0	0	0	0	0	0	0	0	771
2:00 PM	18	62	174	207	140	115	74	13	3	0	0	0	0	0	0	0	0	806
3:00 PM	15	83	156	202	182	146	69	13	7	0	3	0	0	0	0	0	0	876
4:00 PM	17	53	126	178	231	209	77	10	0	0	0	0	0	0	0	0	0	901
5:00 PM	8	63	123	157	197	196	122	15	4	1	0	0	0	0	0	0	0	886
6:00 PM	10	62	163	159	137	144	70	5	3	0	0	0	0	0	0	0	0	753
7:00 PM	15	61	113	164	140	144	62	15	4	0	0	0	0	0	0	0	0	718
8:00 PM	10	37	117	147	119	104	61	17	3	0	0	0	0	0	0	0	0	615
9:00 PM	5	47	87	137	91	94	26	10	2	0	0	1	0	0	0	0	0	500
10:00 PM	1	12	27	58	47	46	49	12	1	0	0	0	0	0	0	0	0	253
11:00 PM	0	5	13	36	28	38	35	9	5	1	0	0	0	0	0	0	0	170
<b>Total</b>	<b>177</b>	<b>896</b>	<b>2,040</b>	<b>2,531</b>	<b>2,455</b>	<b>2,765</b>	<b>1,792</b>	<b>567</b>	<b>147</b>	<b>31</b>	<b>8</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13,410</b>
<b>Percent</b>	<b>1.3%</b>	<b>6.7%</b>	<b>15.2%</b>	<b>18.9%</b>	<b>18.3%</b>	<b>20.6%</b>	<b>13.4%</b>	<b>4.2%</b>	<b>1.1%</b>	<b>0.2%</b>	<b>0.1%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>

Daily Percentile Speed Summary		Speed Statistics	
50th Percentile (Median)	27.2 mph	Mean (Average) Speed	27.1 mph
85th Percentile	36.1 mph	10 mph Pace	24.8 - 34.8 mph
95th Percentile	40.5 mph	Percent in Pace	39.0 %

Location: N Livermore Ave, B/W Arroyo Plaza Rd & Las Positas Rd  
 Date Range: 10/2/2019 to 10/3/2019  
 Site Code: 01

Thursday, October 3, 2019  
 Southbound

Time	Speed Range (mph)																	Total Volume
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	
12:00 AM	0	1	9	15	28	35	39	15	1	0	0	0	0	0	0	0	0	143
1:00 AM	0	0	0	4	8	16	15	9	2	0	0	0	0	0	0	0	0	54
2:00 AM	0	0	1	3	11	16	14	5	2	0	0	0	0	0	0	0	0	52
3:00 AM	0	1	4	5	11	15	22	18	4	1	1	0	0	0	0	0	0	82
4:00 AM	0	0	1	3	8	32	52	17	8	0	0	0	0	0	0	0	0	121
5:00 AM	0	0	1	7	17	46	71	46	8	5	2	0	0	0	0	0	0	203
6:00 AM	0	0	2	10	67	112	91	55	15	3	1	1	0	0	0	0	0	357
7:00 AM	1	7	14	65	129	190	208	95	27	2	1	0	0	0	0	0	0	739
8:00 AM	0	2	15	66	212	248	196	103	29	2	0	0	0	0	0	0	0	873
9:00 AM	7	22	47	126	196	203	123	42	3	3	0	0	0	0	0	0	0	772
10:00 AM	10	39	103	151	181	135	77	23	4	0	0	0	0	0	0	0	0	723
11:00 AM	27	72	190	206	186	96	52	12	4	0	0	0	0	0	0	0	0	845
12:00 PM	29	119	194	250	170	84	34	12	3	0	0	0	0	0	0	0	0	895
1:00 PM	17	85	149	241	269	121	46	5	1	0	0	0	0	0	0	0	0	934
2:00 PM	6	27	89	254	276	174	68	21	1	1	0	0	0	0	0	0	0	917
3:00 PM	2	5	43	208	275	194	83	32	7	1	0	0	0	0	0	0	0	850
4:00 PM	13	53	109	221	287	177	70	33	8	1	0	0	0	0	0	0	0	972
5:00 PM	10	93	173	302	288	154	52	11	5	0	0	0	0	0	0	0	0	1,088
6:00 PM	14	61	135	228	272	160	84	32	5	2	0	0	0	0	0	0	0	993
7:00 PM	1	6	39	187	230	168	112	28	5	0	0	0	0	0	0	0	0	776
8:00 PM	0	0	21	83	146	158	103	27	9	2	0	0	0	0	0	0	0	549
9:00 PM	0	0	16	91	139	171	81	21	4	0	0	0	0	0	0	0	0	523
10:00 PM	0	0	7	53	77	95	74	12	1	2	0	0	0	0	0	0	0	321
11:00 PM	0	0	6	42	43	61	49	10	4	0	1	0	0	0	0	0	0	216
<b>Total</b>	<b>137</b>	<b>593</b>	<b>1,368</b>	<b>2,821</b>	<b>3,526</b>	<b>2,861</b>	<b>1,816</b>	<b>684</b>	<b>160</b>	<b>25</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13,998</b>
<b>Percent</b>	<b>1.0%</b>	<b>4.2%</b>	<b>9.8%</b>	<b>20.2%</b>	<b>25.2%</b>	<b>20.4%</b>	<b>13.0%</b>	<b>4.9%</b>	<b>1.1%</b>	<b>0.2%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	

Daily Percentile Speed Summary		Speed Statistics	
50th Percentile (Median)	27.8 mph	Mean (Average) Speed	28 mph
85th Percentile	36.4 mph	10 mph Pace	22.7 - 32.7 mph
95th Percentile	40.7 mph	Percent in Pace	47.33 %

Location: N Livermore Ave, B/W Arroyo Plaza Rd & Las Positas Rd  
 Date Range: 10/2/2019 to 10/3/2019  
 Site Code: 01

**Total Study Average  
 Northbound**

Time	Speed Range (mph)																	Total Volume
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	
12:00 AM	0	3	8	13	20	19	26	11	3	0	0	0	0	0	0	0	0	103
1:00 AM	0	3	5	4	6	14	12	11	3	1	1	0	0	0	0	0	0	60
2:00 AM	0	1	4	3	7	15	13	13	4	1	0	0	0	0	0	0	0	61
3:00 AM	0	1	7	13	8	16	26	17	5	1	0	0	0	0	0	0	0	94
4:00 AM	0	4	20	20	17	37	59	43	18	5	1	0	0	0	0	0	0	224
5:00 AM	1	8	30	37	23	69	118	69	21	6	1	0	0	0	0	0	0	383
6:00 AM	5	24	63	60	75	141	179	58	22	4	1	1	0	0	0	0	0	633
7:00 AM	6	21	73	57	137	260	207	65	14	4	0	0	0	0	0	0	0	844
8:00 AM	6	18	52	72	168	271	159	48	9	1	1	0	0	0	0	0	0	805
9:00 AM	4	39	76	107	109	170	104	38	5	2	0	0	0	0	0	0	0	654
10:00 AM	9	59	121	135	117	146	85	24	3	2	0	0	0	0	0	0	0	701
11:00 AM	14	61	139	153	136	152	73	20	3	1	0	0	0	0	0	0	0	752
12:00 PM	17	71	152	178	165	121	71	19	4	0	0	0	0	0	0	0	0	798
1:00 PM	12	75	179	218	158	108	43	13	4	0	0	0	0	0	0	0	0	810
2:00 PM	18	73	172	203	171	116	66	10	3	0	0	0	0	0	0	0	0	832
3:00 PM	13	74	170	197	175	165	74	15	4	1	2	0	0	0	0	0	0	890
4:00 PM	13	49	136	190	211	208	94	16	1	0	0	0	0	0	0	0	0	918
5:00 PM	7	62	123	152	178	193	117	22	3	1	0	0	0	0	0	0	0	858
6:00 PM	9	56	133	139	155	157	77	12	3	1	1	0	0	0	0	0	0	743
7:00 PM	12	55	129	162	133	123	63	14	4	0	0	0	0	0	0	0	0	695
8:00 PM	7	35	100	128	117	110	62	19	4	0	0	0	0	0	0	0	0	582
9:00 PM	7	48	84	117	81	95	58	14	3	1	0	1	0	0	0	0	0	509
10:00 PM	2	11	33	64	61	54	51	12	3	0	0	0	0	0	0	0	0	291
11:00 PM	0	5	18	28	25	34	31	11	6	1	0	0	0	0	0	0	0	159
<b>Total</b>	<b>162</b>	<b>856</b>	<b>2,027</b>	<b>2,450</b>	<b>2,453</b>	<b>2,794</b>	<b>1,868</b>	<b>594</b>	<b>152</b>	<b>33</b>	<b>8</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13,399</b>
<b>Percent</b>	<b>1.2%</b>	<b>6.4%</b>	<b>15.1%</b>	<b>18.3%</b>	<b>18.3%</b>	<b>20.9%</b>	<b>13.9%</b>	<b>4.4%</b>	<b>1.1%</b>	<b>0.2%</b>	<b>0.1%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>

Note: Average only considered on days with 24-hours of data.

Total Study Percentile Speed Summary		Total Study Speed Statistics	
50th Percentile (Median)	27.5 mph	Mean (Average) Speed	27.3 mph
85th Percentile	36.2 mph	10 mph Pace	26.1 - 36.1 mph
95th Percentile	40.5 mph	Percent in Pace	39.4 %



Location: N Livermore Ave, B/W Arroyo Plaza Rd & Las Positas Rd  
 Date Range: 10/2/2019 to 10/3/2019  
 Site Code: 01

**Total Study Average  
 Southbound**

Time	Speed Range (mph)																	Total Volume
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	
12:00 AM	0	1	5	16	25	36	33	19	1	1	0	0	0	0	0	0	0	137
1:00 AM	0	0	0	8	11	16	13	7	2	1	0	0	0	0	0	0	0	58
2:00 AM	0	0	2	4	11	13	15	8	3	1	0	0	0	0	0	0	0	57
3:00 AM	0	1	3	6	11	15	27	15	4	2	1	0	0	0	0	0	0	85
4:00 AM	0	1	2	6	12	26	42	26	8	0	1	0	0	0	0	0	0	124
5:00 AM	0	0	1	8	20	49	66	43	8	4	2	0	0	0	0	0	0	201
6:00 AM	0	0	3	13	59	107	104	61	15	5	1	1	0	0	0	0	0	369
7:00 AM	1	5	15	64	124	190	202	107	26	7	1	0	0	0	0	0	0	742
8:00 AM	1	5	23	78	215	251	213	111	28	4	0	1	0	0	0	0	0	930
9:00 AM	4	13	31	99	197	217	156	55	10	3	0	0	0	0	0	0	0	785
10:00 AM	6	20	57	111	172	190	133	46	7	4	0	0	0	0	0	0	0	746
11:00 AM	14	40	118	190	187	141	106	33	12	2	0	0	0	0	0	0	0	843
12:00 PM	15	63	121	205	205	141	84	26	9	2	0	1	0	0	0	0	0	872
1:00 PM	10	50	115	210	266	161	97	23	3	1	0	0	0	0	0	0	0	936
2:00 PM	3	21	72	205	284	205	89	30	4	1	0	1	0	0	0	0	0	915
3:00 PM	1	10	55	198	257	217	100	40	10	2	0	0	0	0	0	0	0	890
4:00 PM	12	50	110	208	290	214	77	33	8	1	1	0	0	0	0	0	0	1,004
5:00 PM	16	82	180	274	309	161	56	17	5	1	0	0	0	0	0	0	0	1,101
6:00 PM	10	41	104	203	282	185	104	37	9	1	0	0	0	0	0	0	0	976
7:00 PM	1	5	34	174	232	189	110	34	7	1	0	0	0	0	0	0	0	787
8:00 PM	0	1	14	107	162	154	112	25	7	1	0	0	0	0	0	0	0	583
9:00 PM	0	0	13	79	129	178	97	32	5	1	0	0	0	0	0	0	0	534
10:00 PM	0	0	7	57	80	99	75	16	4	2	0	0	1	0	0	0	0	341
11:00 PM	0	0	5	34	39	55	45	15	4	1	1	0	0	0	0	0	0	199
<b>Total</b>	<b>94</b>	<b>409</b>	<b>1,090</b>	<b>2,557</b>	<b>3,579</b>	<b>3,210</b>	<b>2,156</b>	<b>859</b>	<b>199</b>	<b>49</b>	<b>8</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14,215</b>
<b>Percent</b>	<b>0.7%</b>	<b>2.9%</b>	<b>7.7%</b>	<b>18.0%</b>	<b>25.2%</b>	<b>22.6%</b>	<b>15.2%</b>	<b>6.0%</b>	<b>1.4%</b>	<b>0.3%</b>	<b>0.1%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>

Note: Average only considered on days with 24-hours of data.

Total Study Percentile Speed Summary		Total Study Speed Statistics	
50th Percentile (Median)	29.1 mph	Mean (Average) Speed	29.2 mph
85th Percentile	37.1 mph	10 mph Pace	24.3 - 34.3 mph
95th Percentile	41.6 mph	Percent in Pace	48.1 %

Location: N Livermore Ave, B/W Arroyo Plaza Rd & Las Positas Rd  
 Date Range: 10/2/2019 - 10/8/2019  
 Site Code: 01

Time	Wednesday			Thursday			Friday			Saturday			Sunday			Monday			Tuesday			Mid-Week Average		
	10/2/2019			10/3/2019			10/4/2019			10/5/2019			10/6/2019			10/7/2019			10/8/2019					
	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total
12:00 AM	95	127	222	106	143	249	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	101	135	236
1:00 AM	56	59	115	60	54	114	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	58	57	115
2:00 AM	51	58	109	67	52	119	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	59	55	114
3:00 AM	101	83	184	82	82	164	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	92	83	174
4:00 AM	220	121	341	222	121	343	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	221	121	342
5:00 AM	384	194	578	378	203	581	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	381	199	580
6:00 AM	599	380	979	660	357	1,017	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	630	369	998
7:00 AM	867	736	1,603	814	739	1,553	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	841	738	1,578
8:00 AM	806	981	1,787	800	873	1,673	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	803	927	1,730
9:00 AM	626	792	1,418	680	772	1,452	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	653	782	1,435
10:00 AM	655	763	1,418	741	723	1,464	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	698	743	1,441
11:00 AM	770	832	1,602	729	845	1,574	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	750	839	1,588
12:00 PM	766	843	1,609	822	895	1,717	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	794	869	1,663
1:00 PM	844	932	1,776	771	934	1,705	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	808	933	1,741
2:00 PM	852	906	1,758	806	917	1,723	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	829	912	1,741
3:00 PM	898	926	1,824	876	850	1,726	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	887	888	1,775
4:00 PM	929	1,029	1,958	901	972	1,873	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	915	1,001	1,916
5:00 PM	824	1,111	1,935	886	1,088	1,974	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	855	1,100	1,955
6:00 PM	726	956	1,682	753	993	1,746	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	740	975	1,714
7:00 PM	667	790	1,457	718	776	1,494	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	693	783	1,476
8:00 PM	544	613	1,157	615	549	1,164	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	580	581	1,161
9:00 PM	514	542	1,056	500	523	1,023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	507	533	1,040
10:00 PM	324	355	679	253	321	574	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	289	338	627
11:00 PM	141	178	319	170	216	386	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	156	197	353
Total	13,259	14,307	27,566	13,410	13,998	27,408	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13,335	14,153	27,487
Percent	48%	52%	-	49%	51%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	49%	51%	-
AM Peak	07:00	08:00	08:00	07:00	08:00	08:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	07:00	08:00	08:00
Vol.	867	981	1,787	814	873	1,673	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	841	927	1,730
PM Peak	16:00	17:00	16:00	16:00	17:00	17:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16:00	17:00	17:00
Vol.	929	1,111	1,958	901	1,088	1,974	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	915	1,100	1,955

1. Mid-week average includes data between Tuesday and Thursday.

## Vehicle Classification Report Summary



**Location:** N Livermore Ave, B/W Las Positas Rd & Portola Ave  
**Count Direction:** Northbound / Southbound  
**Date Range:** 10/2/2019 to 10/3/2019  
**Site Code:** 02

	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
Study Total														
Northbound	72	20,166	6,536	15	2,421	154	0	54	74	61	7	0	32	29,592
Percent	0.2%	68.1%	22.1%	0.1%	8.2%	0.5%	0.0%	0.2%	0.3%	0.2%	0.0%	0.0%	0.1%	100%
Southbound	195	22,841	5,965	30	1,494	510	0	111	268	525	3	14	175	32,131
Percent	0.6%	71.1%	18.6%	0.1%	4.6%	1.6%	0.0%	0.3%	0.8%	1.6%	0.0%	0.0%	0.5%	100%
Total	267	43,007	12,501	45	3,915	664	0	165	342	586	10	14	207	61,723
Percent	0.4%	69.7%	20.3%	0.1%	6.3%	1.1%	0.0%	0.3%	0.6%	0.9%	0.0%	0.0%	0.3%	100%

### FHWA Vehicle Classification

Class 1 - Motorcycles	Class 8 - Four or Fewer Axle Single-Trailer Trucks
Class 2 - Passenger Cars	Class 9 - Five-Axle Single-Trailer Trucks
Class 3 - Other Two-Axle, Four-Tire Single Unit Vehicles	Class 10 - Six or More Axle Single-Trailer Trucks
Class 4 - Buses	Class 11 - Five or fewer Axle Multi-Trailer Trucks
Class 5 - Two-Axle, Six-Tire, Single-Unit Trucks	Class 12 - Six-Axle Multi-Trailer Trucks
Class 6 - Three-Axle Single-Unit Trucks	Class 13 - Seven or More Axle Multi-Trailer Trucks
Class 7 - Four or More Axle Single-Unit Trucks	

**Location:** N Livermore Ave, B/W Las Positas Rd & Portola Ave  
**Date Range:** 10/2/2019 to 10/3/2019  
**Site Code:** 02

**Wednesday, October 2, 2019**  
**Northbound**

Time	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
12:00 AM	0	54	11	0	5	0	0	0	1	0	0	0	0	71
1:00 AM	0	29	2	0	5	0	0	0	1	0	0	0	0	37
2:00 AM	0	20	6	0	4	1	0	0	0	0	0	0	0	31
3:00 AM	0	47	13	0	8	0	0	0	3	1	0	0	1	73
4:00 AM	0	119	32	0	25	1	0	0	3	0	0	0	0	180
5:00 AM	3	216	80	1	38	3	0	1	1	2	0	0	1	346
6:00 AM	3	347	101	0	67	5	0	1	2	1	0	0	1	528
7:00 AM	0	572	156	0	68	6	0	5	3	4	0	0	3	817
8:00 AM	5	663	241	0	73	7	0	2	5	1	0	0	2	999
9:00 AM	0	449	168	0	79	4	0	4	5	0	0	0	0	709
10:00 AM	1	519	166	0	72	5	0	1	1	2	0	0	2	769
11:00 AM	1	591	216	0	76	4	0	2	0	2	0	0	1	893
12:00 PM	1	591	197	0	86	5	0	2	1	3	0	0	1	887
1:00 PM	3	720	231	3	70	5	0	2	3	3	1	0	2	1,043
2:00 PM	0	669	274	0	91	7	0	2	2	1	2	0	1	1,049
3:00 PM	0	695	266	0	93	5	0	2	1	4	0	0	0	1,066
4:00 PM	4	737	265	0	82	5	0	2	0	1	0	0	1	1,097
5:00 PM	8	694	220	1	59	3	0	2	2	1	0	0	1	991
6:00 PM	1	550	174	0	52	3	0	3	2	3	0	0	0	788
7:00 PM	1	497	142	0	58	5	0	0	0	2	0	0	0	705
8:00 PM	0	409	108	0	34	2	0	0	2	1	0	0	1	557
9:00 PM	1	361	83	0	29	2	0	0	0	0	0	0	0	476
10:00 PM	0	227	44	1	16	2	0	0	0	0	0	0	1	291
11:00 PM	1	96	12	0	6	0	0	0	1	0	0	0	0	116
<b>Total</b>	<b>33</b>	<b>9,872</b>	<b>3,208</b>	<b>6</b>	<b>1,196</b>	<b>80</b>	<b>0</b>	<b>31</b>	<b>39</b>	<b>32</b>	<b>3</b>	<b>0</b>	<b>19</b>	<b>14,519</b>
<b>Percent</b>	<b>0.2%</b>	<b>68.0%</b>	<b>22.1%</b>	<b>0.0%</b>	<b>8.2%</b>	<b>0.6%</b>	<b>0.0%</b>	<b>0.2%</b>	<b>0.3%</b>	<b>0.2%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.1%</b>	

**Location:** N Livermore Ave, B/W Las Positas Rd & Portola Ave  
**Date Range:** 10/2/2019 to 10/3/2019  
**Site Code:** 02

**Wednesday, October 2, 2019**  
**Southbound**

Time	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
12:00 AM	0	105	21	0	1	4	0	0	1	0	0	0	0	132
1:00 AM	0	27	12	0	0	2	0	0	0	0	0	0	0	41
2:00 AM	0	36	5	0	0	3	0	0	1	0	0	0	1	46
3:00 AM	0	46	6	0	1	1	0	1	2	1	0	0	0	58
4:00 AM	0	61	14	0	3	4	0	0	1	1	0	0	0	84
5:00 AM	1	101	39	0	9	4	0	0	2	5	0	0	0	161
6:00 AM	0	257	85	4	23	13	0	2	5	3	0	1	2	395
7:00 AM	4	464	136	3	35	20	0	2	4	21	0	0	0	689
8:00 AM	7	565	217	1	54	25	0	1	24	34	0	4	10	942
9:00 AM	11	597	204	0	47	21	0	1	14	22	0	0	7	924
10:00 AM	4	623	162	2	57	10	0	4	7	12	0	0	7	888
11:00 AM	2	712	196	0	55	7	0	4	10	12	0	1	3	1,002
12:00 PM	5	829	202	1	55	7	0	6	8	12	0	0	1	1,126
1:00 PM	5	815	185	0	79	5	0	9	6	5	1	0	5	1,115
2:00 PM	7	761	213	0	68	12	0	3	6	7	0	0	6	1,083
3:00 PM	5	788	245	1	65	8	0	3	8	10	0	0	7	1,140
4:00 PM	7	877	207	2	71	7	0	2	6	18	0	0	8	1,205
5:00 PM	7	905	223	0	56	13	0	5	4	20	0	1	17	1,251
6:00 PM	8	844	194	1	46	13	0	4	9	18	0	0	13	1,150
7:00 PM	9	670	162	0	27	9	0	3	11	10	0	1	3	905
8:00 PM	4	513	122	1	20	22	0	1	6	18	0	0	4	711
9:00 PM	7	425	88	0	26	19	0	2	3	8	0	0	2	580
10:00 PM	1	305	78	0	6	9	0	0	4	9	0	0	0	412
11:00 PM	1	169	31	0	5	10	0	1	1	2	0	0	0	220
<b>Total</b>	<b>95</b>	<b>11,495</b>	<b>3,047</b>	<b>16</b>	<b>809</b>	<b>248</b>	<b>0</b>	<b>54</b>	<b>143</b>	<b>248</b>	<b>1</b>	<b>8</b>	<b>96</b>	<b>16,260</b>
<b>Percent</b>	<b>0.6%</b>	<b>70.7%</b>	<b>18.7%</b>	<b>0.1%</b>	<b>5.0%</b>	<b>1.5%</b>	<b>0.0%</b>	<b>0.3%</b>	<b>0.9%</b>	<b>1.5%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.6%</b>	

Location: N Livermore Ave, B/W Las Positas Rd & Portola Ave  
 Date Range: 10/2/2019 to 10/3/2019  
 Site Code: 02

Thursday, October 3, 2019  
 Northbound

Time	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
12:00 AM	1	73	9	0	5	0	0	0	0	0	0	0	0	88
1:00 AM	0	28	6	0	3	1	0	0	1	0	0	0	0	39
2:00 AM	0	38	11	0	7	0	0	0	0	0	0	0	0	56
3:00 AM	0	39	13	0	8	0	0	0	0	0	0	0	0	60
4:00 AM	1	127	36	1	24	1	0	0	1	0	0	0	0	191
5:00 AM	4	236	74	0	34	3	0	0	4	0	0	0	1	356
6:00 AM	0	384	102	1	72	2	0	2	2	1	1	0	1	568
7:00 AM	1	527	151	2	52	8	0	1	4	3	0	0	1	750
8:00 AM	1	626	233	0	68	11	0	0	4	4	1	0	2	950
9:00 AM	1	517	161	0	75	8	0	4	0	0	0	0	1	767
10:00 AM	3	551	212	0	80	5	0	2	0	2	0	0	0	855
11:00 AM	2	626	220	0	71	4	0	1	0	2	0	0	0	926
12:00 PM	4	670	200	0	72	3	0	0	2	1	0	0	0	952
1:00 PM	2	645	236	1	96	4	0	1	2	5	0	0	1	993
2:00 PM	1	726	260	3	97	5	0	2	0	1	0	0	3	1,098
3:00 PM	4	865	319	0	108	1	0	4	2	4	0	0	0	1,307
4:00 PM	3	721	250	0	76	4	0	1	4	0	1	0	0	1,060
5:00 PM	0	681	226	1	74	4	0	1	1	2	0	0	2	992
6:00 PM	4	621	187	0	58	2	0	3	1	3	1	0	1	881
7:00 PM	1	529	156	0	63	3	0	1	2	0	0	0	0	755
8:00 PM	0	422	127	0	41	3	0	0	1	1	0	0	0	595
9:00 PM	3	352	84	0	23	2	0	0	1	0	0	0	0	465
10:00 PM	2	182	36	0	11	0	0	0	0	0	0	0	0	231
11:00 PM	1	108	19	0	7	0	0	0	3	0	0	0	0	138
<b>Total</b>	<b>39</b>	<b>10,294</b>	<b>3,328</b>	<b>9</b>	<b>1,225</b>	<b>74</b>	<b>0</b>	<b>23</b>	<b>35</b>	<b>29</b>	<b>4</b>	<b>0</b>	<b>13</b>	<b>15,073</b>
<b>Percent</b>	<b>0.3%</b>	<b>68.3%</b>	<b>22.1%</b>	<b>0.1%</b>	<b>8.1%</b>	<b>0.5%</b>	<b>0.0%</b>	<b>0.2%</b>	<b>0.2%</b>	<b>0.2%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.1%</b>	

**Location:** N Livermore Ave, B/W Las Positas Rd & Portola Ave  
**Date Range:** 10/2/2019 to 10/3/2019  
**Site Code:** 02

**Thursday, October 3, 2019**  
**Southbound**

Time	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
12:00 AM	1	112	12	0	1	4	0	0	0	0	0	0	0	130
1:00 AM	0	31	8	0	0	4	0	0	0	0	0	0	0	43
2:00 AM	0	27	8	0	1	4	0	0	0	0	0	0	0	40
3:00 AM	1	53	6	0	1	1	0	0	1	1	0	0	0	64
4:00 AM	0	61	15	1	5	1	0	0	1	0	0	0	0	84
5:00 AM	0	124	35	1	8	5	0	0	1	5	0	0	0	179
6:00 AM	4	218	91	2	34	9	0	1	4	4	0	0	0	367
7:00 AM	1	491	155	2	31	8	0	2	9	25	0	0	6	730
8:00 AM	2	689	147	1	28	25	0	2	12	23	0	0	6	935
9:00 AM	6	692	153	0	37	14	0	0	12	18	0	3	10	945
10:00 AM	1	620	184	0	35	13	0	3	8	10	0	0	2	876
11:00 AM	15	742	191	2	60	21	0	6	6	14	0	0	4	1,061
12:00 PM	5	834	202	0	55	10	0	4	4	15	0	1	3	1,133
1:00 PM	7	763	189	0	69	10	0	5	4	15	0	0	4	1,066
2:00 PM	4	632	210	1	65	6	0	5	3	8	1	0	2	937
3:00 PM	8	728	193	0	39	7	0	1	5	10	0	0	4	995
4:00 PM	10	828	194	0	46	20	0	7	9	18	0	0	7	1,139
5:00 PM	7	899	198	0	59	12	0	11	10	33	0	0	12	1,241
6:00 PM	9	847	201	2	36	12	0	3	11	18	1	1	10	1,151
7:00 PM	8	671	145	0	30	25	0	2	7	25	0	1	6	920
8:00 PM	4	456	144	1	13	18	0	2	9	12	0	0	1	660
9:00 PM	1	432	109	0	16	15	0	1	7	15	0	0	0	596
10:00 PM	4	250	79	1	10	10	0	1	1	6	0	0	2	364
11:00 PM	2	146	49	0	6	8	0	1	1	2	0	0	0	215
<b>Total</b>	<b>100</b>	<b>11,346</b>	<b>2,918</b>	<b>14</b>	<b>685</b>	<b>262</b>	<b>0</b>	<b>57</b>	<b>125</b>	<b>277</b>	<b>2</b>	<b>6</b>	<b>79</b>	<b>15,871</b>
<b>Percent</b>	<b>0.6%</b>	<b>71.5%</b>	<b>18.4%</b>	<b>0.1%</b>	<b>4.3%</b>	<b>1.7%</b>	<b>0.0%</b>	<b>0.4%</b>	<b>0.8%</b>	<b>1.7%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.5%</b>	

**Location:** N Livermore Ave, B/W Las Positas Rd & Portola Ave  
**Date Range:** 10/2/2019 to 10/3/2019  
**Site Code:** 02

**Total Study Average**  
**Northbound**

Time	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
12:00 AM	1	64	10	0	5	0	0	0	1	0	0	0	0	81
1:00 AM	0	29	4	0	4	1	0	0	1	0	0	0	0	39
2:00 AM	0	29	9	0	6	1	0	0	0	0	0	0	0	45
3:00 AM	0	43	13	0	8	0	0	0	2	1	0	0	1	68
4:00 AM	1	123	34	1	25	1	0	0	2	0	0	0	0	187
5:00 AM	4	226	77	1	36	3	0	1	3	1	0	0	1	353
6:00 AM	2	366	102	1	70	4	0	2	2	1	1	0	1	552
7:00 AM	1	550	154	1	60	7	0	3	4	4	0	0	2	786
8:00 AM	3	645	237	0	71	9	0	1	5	3	1	0	2	977
9:00 AM	1	483	165	0	77	6	0	4	3	0	0	0	1	740
10:00 AM	2	535	189	0	76	5	0	2	1	2	0	0	1	813
11:00 AM	2	609	218	0	74	4	0	2	0	2	0	0	1	912
12:00 PM	3	631	199	0	79	4	0	1	2	2	0	0	1	922
1:00 PM	3	683	234	2	83	5	0	2	3	4	1	0	2	1,022
2:00 PM	1	698	267	2	94	6	0	2	1	1	1	0	2	1,075
3:00 PM	2	780	293	0	101	3	0	3	2	4	0	0	0	1,188
4:00 PM	4	729	258	0	79	5	0	2	2	1	1	0	1	1,082
5:00 PM	4	688	223	1	67	4	0	2	2	2	0	0	2	995
6:00 PM	3	586	181	0	55	3	0	3	2	3	1	0	1	838
7:00 PM	1	513	149	0	61	4	0	1	1	1	0	0	0	731
8:00 PM	0	416	118	0	38	3	0	0	2	1	0	0	1	579
9:00 PM	2	357	84	0	26	2	0	0	1	0	0	0	0	472
10:00 PM	1	205	40	1	14	1	0	0	0	0	0	0	1	263
11:00 PM	1	102	16	0	7	0	0	0	2	0	0	0	0	128
<b>Total</b>	<b>42</b>	<b>10,090</b>	<b>3,274</b>	<b>10</b>	<b>1,216</b>	<b>81</b>	<b>0</b>	<b>31</b>	<b>44</b>	<b>33</b>	<b>6</b>	<b>0</b>	<b>21</b>	<b>14,848</b>
<b>Percent</b>	<b>0.3%</b>	<b>68.0%</b>	<b>22.1%</b>	<b>0.1%</b>	<b>8.2%</b>	<b>0.5%</b>	<b>0.0%</b>	<b>0.2%</b>	<b>0.3%</b>	<b>0.2%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.1%</b>	

Note: Average only considered on days with 24-hours of data.



**Location:** N Livermore Ave, B/W Las Positas Rd & Portola Ave  
**Date Range:** 10/2/2019 to 10/3/2019  
**Site Code:** 02

**Total Study Average**  
**Southbound**

Time	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
12:00 AM	1	109	17	0	1	4	0	0	1	0	0	0	0	133
1:00 AM	0	29	10	0	0	3	0	0	0	0	0	0	0	42
2:00 AM	0	32	7	0	1	4	0	0	1	0	0	0	1	46
3:00 AM	1	50	6	0	1	1	0	1	2	1	0	0	0	63
4:00 AM	0	61	15	1	4	3	0	0	1	1	0	0	0	86
5:00 AM	1	113	37	1	9	5	0	0	2	5	0	0	0	173
6:00 AM	2	238	88	3	29	11	0	2	5	4	0	1	1	384
7:00 AM	3	478	146	3	33	14	0	2	7	23	0	0	3	712
8:00 AM	5	627	182	1	41	25	0	2	18	29	0	2	8	940
9:00 AM	9	645	179	0	42	18	0	1	13	20	0	2	9	938
10:00 AM	3	622	173	1	46	12	0	4	8	11	0	0	5	885
11:00 AM	9	727	194	1	58	14	0	5	8	13	0	1	4	1,034
12:00 PM	5	832	202	1	55	9	0	5	6	14	0	1	2	1,132
1:00 PM	6	789	187	0	74	8	0	7	5	10	1	0	5	1,092
2:00 PM	6	697	212	1	67	9	0	4	5	8	1	0	4	1,014
3:00 PM	7	758	219	1	52	8	0	2	7	10	0	0	6	1,070
4:00 PM	9	853	201	1	59	14	0	5	8	18	0	0	8	1,176
5:00 PM	7	902	211	0	58	13	0	8	7	27	0	1	15	1,249
6:00 PM	9	846	198	2	41	13	0	4	10	18	1	1	12	1,155
7:00 PM	9	671	154	0	29	17	0	3	9	18	0	1	5	916
8:00 PM	4	485	133	1	17	20	0	2	8	15	0	0	3	688
9:00 PM	4	429	99	0	21	17	0	2	5	12	0	0	1	590
10:00 PM	3	278	79	1	8	10	0	1	3	8	0	0	1	392
11:00 PM	2	158	40	0	6	9	0	1	1	2	0	0	0	219
<b>Total</b>	<b>105</b>	<b>11,429</b>	<b>2,989</b>	<b>19</b>	<b>752</b>	<b>261</b>	<b>0</b>	<b>61</b>	<b>140</b>	<b>267</b>	<b>3</b>	<b>10</b>	<b>93</b>	<b>16,129</b>
<b>Percent</b>	<b>0.7%</b>	<b>70.9%</b>	<b>18.5%</b>	<b>0.1%</b>	<b>4.7%</b>	<b>1.6%</b>	<b>0.0%</b>	<b>0.4%</b>	<b>0.9%</b>	<b>1.7%</b>	<b>0.0%</b>	<b>0.1%</b>	<b>0.6%</b>	

Note: Average only considered on days with 24-hours of data.

**Location:** N Livermore Ave, B/W Las Positas Rd & Portola Ave  
**Date Range:** 10/2/2019 to 10/3/2019  
**Site Code:** 02

**3-Day (Tuesday - Thursday) Average**  
**Northbound**

Time	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
12:00 AM	1	64	10	0	5	0	0	0	1	0	0	0	0	81
1:00 AM	0	29	4	0	4	1	0	0	1	0	0	0	0	39
2:00 AM	0	29	9	0	6	1	0	0	0	0	0	0	0	45
3:00 AM	0	43	13	0	8	0	0	0	2	1	0	0	1	68
4:00 AM	1	123	34	1	25	1	0	0	2	0	0	0	0	187
5:00 AM	4	226	77	1	36	3	0	1	3	1	0	0	1	353
6:00 AM	2	366	102	1	70	4	0	2	2	1	1	0	1	552
7:00 AM	1	550	154	1	60	7	0	3	4	4	0	0	2	786
8:00 AM	3	645	237	0	71	9	0	1	5	3	1	0	2	977
9:00 AM	1	483	165	0	77	6	0	4	3	0	0	0	1	740
10:00 AM	2	535	189	0	76	5	0	2	1	2	0	0	1	813
11:00 AM	2	609	218	0	74	4	0	2	0	2	0	0	1	912
12:00 PM	3	631	199	0	79	4	0	1	2	2	0	0	1	922
1:00 PM	3	683	234	2	83	5	0	2	3	4	1	0	2	1,022
2:00 PM	1	698	267	2	94	6	0	2	1	1	1	0	2	1,075
3:00 PM	2	780	293	0	101	3	0	3	2	4	0	0	0	1,188
4:00 PM	4	729	258	0	79	5	0	2	2	1	1	0	1	1,082
5:00 PM	4	688	223	1	67	4	0	2	2	2	0	0	2	995
6:00 PM	3	586	181	0	55	3	0	3	2	3	1	0	1	838
7:00 PM	1	513	149	0	61	4	0	1	1	1	0	0	0	731
8:00 PM	0	416	118	0	38	3	0	0	2	1	0	0	1	579
9:00 PM	2	357	84	0	26	2	0	0	1	0	0	0	0	472
10:00 PM	1	205	40	1	14	1	0	0	0	0	0	0	1	263
11:00 PM	1	102	16	0	7	0	0	0	2	0	0	0	0	128
<b>Total</b>	<b>42</b>	<b>10,090</b>	<b>3,274</b>	<b>10</b>	<b>1,216</b>	<b>81</b>	<b>0</b>	<b>31</b>	<b>44</b>	<b>33</b>	<b>6</b>	<b>0</b>	<b>21</b>	<b>14,848</b>
<b>Percent</b>	<b>0.3%</b>	<b>68.0%</b>	<b>22.1%</b>	<b>0.1%</b>	<b>8.2%</b>	<b>0.5%</b>	<b>0.0%</b>	<b>0.2%</b>	<b>0.3%</b>	<b>0.2%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.1%</b>	

**Location:** N Livermore Ave, B/W Las Positas Rd & Portola Ave  
**Date Range:** 10/2/2019 to 10/3/2019  
**Site Code:** 02

**3-Day (Tuesday - Thursday) Average**  
**Southbound**

Time	FHWA Vehicle Classification													Total Volume
	1	2	3	4	5	6	7	8	9	10	11	12	13	
12:00 AM	1	109	17	0	1	4	0	0	1	0	0	0	0	133
1:00 AM	0	29	10	0	0	3	0	0	0	0	0	0	0	42
2:00 AM	0	32	7	0	1	4	0	0	1	0	0	0	1	46
3:00 AM	1	50	6	0	1	1	0	1	2	1	0	0	0	63
4:00 AM	0	61	15	1	4	3	0	0	1	1	0	0	0	86
5:00 AM	1	113	37	1	9	5	0	0	2	5	0	0	0	173
6:00 AM	2	238	88	3	29	11	0	2	5	4	0	1	1	384
7:00 AM	3	478	146	3	33	14	0	2	7	23	0	0	3	712
8:00 AM	5	627	182	1	41	25	0	2	18	29	0	2	8	940
9:00 AM	9	645	179	0	42	18	0	1	13	20	0	2	9	938
10:00 AM	3	622	173	1	46	12	0	4	8	11	0	0	5	885
11:00 AM	9	727	194	1	58	14	0	5	8	13	0	1	4	1,034
12:00 PM	5	832	202	1	55	9	0	5	6	14	0	1	2	1,132
1:00 PM	6	789	187	0	74	8	0	7	5	10	1	0	5	1,092
2:00 PM	6	697	212	1	67	9	0	4	5	8	1	0	4	1,014
3:00 PM	7	758	219	1	52	8	0	2	7	10	0	0	6	1,070
4:00 PM	9	853	201	1	59	14	0	5	8	18	0	0	8	1,176
5:00 PM	7	902	211	0	58	13	0	8	7	27	0	1	15	1,249
6:00 PM	9	846	198	2	41	13	0	4	10	18	1	1	12	1,155
7:00 PM	9	671	154	0	29	17	0	3	9	18	0	1	5	916
8:00 PM	4	485	133	1	17	20	0	2	8	15	0	0	3	688
9:00 PM	4	429	99	0	21	17	0	2	5	12	0	0	1	590
10:00 PM	3	278	79	1	8	10	0	1	3	8	0	0	1	392
11:00 PM	2	158	40	0	6	9	0	1	1	2	0	0	0	219
<b>Total</b>	<b>105</b>	<b>11,429</b>	<b>2,989</b>	<b>19</b>	<b>752</b>	<b>261</b>	<b>0</b>	<b>61</b>	<b>140</b>	<b>267</b>	<b>3</b>	<b>10</b>	<b>93</b>	<b>16,129</b>
<b>Percent</b>	<b>0.7%</b>	<b>70.9%</b>	<b>18.5%</b>	<b>0.1%</b>	<b>4.7%</b>	<b>1.6%</b>	<b>0.0%</b>	<b>0.4%</b>	<b>0.9%</b>	<b>1.7%</b>	<b>0.0%</b>	<b>0.1%</b>	<b>0.6%</b>	

## Vehicle Speed Report Summary



**Location:** N Livermore Ave, B/W Las Positas Rd & Portola Ave  
**Count Direction:** Northbound / Southbound  
**Date Range:** 10/2/2019 to 10/3/2019  
**Site Code:** 02

	Speed Range (mph)																	Total Volume
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	
Study Total																		
Northbound	0	17	59	375	2,827	8,406	9,366	5,920	2,022	473	93	20	11	1	0	1	1	29,592
Percent	0.0%	0.1%	0.2%	1.3%	9.6%	28.4%	31.7%	20.0%	6.8%	1.6%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	100%
Southbound	66	315	900	1,854	3,873	7,594	10,105	5,688	1,428	264	35	5	3	1	0	0	0	32,131
Percent	0.2%	1.0%	2.8%	5.8%	12.1%	23.6%	31.4%	17.7%	4.4%	0.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%
Total	66	332	959	2,229	6,700	16,000	19,471	11,608	3,450	737	128	25	14	2	0	1	1	61,723
Percent	0.1%	0.5%	1.6%	3.6%	10.9%	25.9%	31.5%	18.8%	5.6%	1.2%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100%

Total Study Percentile Speed Summary			Total Study Speed Statistics		
<b>Northbound</b>			<b>Northbound</b>		
50th Percentile (Median)	36.6	mph	Mean (Average) Speed	36.9	mph
85th Percentile	42.9	mph	10 mph Pace	30.9 - 40.9	mph
95th Percentile	47.0	mph	Percent in Pace	60.6	%
<b>Southbound</b>			<b>Southbound</b>		
50th Percentile (Median)	35.7	mph	Mean (Average) Speed	34.8	mph
85th Percentile	41.7	mph	10 mph Pace	31.5 - 41.5	mph
95th Percentile	45.3	mph	Percent in Pace	56.1	%

Location: N Livermore Ave, B/W Las Positas Rd & Portola Ave  
 Date Range: 10/2/2019 to 10/3/2019  
 Site Code: 02



Wednesday, October 2, 2019

Northbound

Time	Speed Range (mph)																	Total Volume
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	
12:00 AM	0	0	0	0	2	8	20	26	10	3	1	0	0	0	0	0	1	71
1:00 AM	0	0	0	0	0	6	10	13	6	1	1	0	0	0	0	0	0	37
2:00 AM	0	0	0	0	0	7	7	11	4	1	1	0	0	0	0	0	0	31
3:00 AM	0	0	0	0	5	12	16	26	10	3	1	0	0	0	0	0	0	73
4:00 AM	0	0	0	3	3	15	28	69	36	22	4	0	0	0	0	0	0	180
5:00 AM	0	0	0	1	15	52	66	104	74	24	6	2	1	1	0	0	0	346
6:00 AM	0	0	0	6	29	46	154	168	90	29	4	2	0	0	0	0	0	528
7:00 AM	0	0	0	4	39	205	272	208	72	12	5	0	0	0	0	0	0	817
8:00 AM	0	0	2	1	91	314	303	220	55	11	1	0	1	0	0	0	0	999
9:00 AM	0	0	3	2	99	217	210	121	50	5	1	0	0	0	0	1	0	709
10:00 AM	0	0	0	11	72	231	239	157	51	7	1	0	0	0	0	0	0	769
11:00 AM	0	0	4	13	94	283	285	160	49	4	1	0	0	0	0	0	0	893
12:00 PM	0	0	1	14	105	292	282	143	37	12	1	0	0	0	0	0	0	887
1:00 PM	0	0	6	10	109	388	301	165	48	14	2	0	0	0	0	0	0	1,043
2:00 PM	0	0	0	7	118	365	339	160	49	8	2	1	0	0	0	0	0	1,049
3:00 PM	0	0	1	6	138	318	353	187	50	11	2	0	0	0	0	0	0	1,066
4:00 PM	0	0	3	8	113	298	389	222	56	7	1	0	0	0	0	0	0	1,097
5:00 PM	0	0	0	4	81	259	332	240	63	11	0	1	0	0	0	0	0	991
6:00 PM	0	0	1	2	80	246	293	124	34	6	2	0	0	0	0	0	0	788
7:00 PM	0	0	0	4	44	215	272	121	38	10	1	0	0	0	0	0	0	705
8:00 PM	0	0	0	2	40	131	195	123	48	14	3	1	0	0	0	0	0	557
9:00 PM	0	0	0	2	25	100	196	109	37	5	1	0	1	0	0	0	0	476
10:00 PM	0	0	0	2	13	28	107	89	41	8	1	1	1	0	0	0	0	291
11:00 PM	0	0	0	0	0	11	41	38	17	4	4	1	0	0	0	0	0	116
<b>Total</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>102</b>	<b>1,315</b>	<b>4,047</b>	<b>4,710</b>	<b>3,004</b>	<b>1,025</b>	<b>232</b>	<b>47</b>	<b>9</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>14,519</b>
<b>Percent</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.1%</b>	<b>0.7%</b>	<b>9.1%</b>	<b>27.9%</b>	<b>32.4%</b>	<b>20.7%</b>	<b>7.1%</b>	<b>1.6%</b>	<b>0.3%</b>	<b>0.1%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>

Daily Percentile Speed Summary		Speed Statistics	
50th Percentile (Median)	36.8 mph	Mean (Average) Speed	37.2 mph
85th Percentile	43.2 mph	10 mph Pace	31.8 - 41.8 mph
95th Percentile	47.1 mph	Percent in Pace	61.4 %

Location: N Livermore Ave, B/W Las Positas Rd & Portola Ave  
 Date Range: 10/2/2019 to 10/3/2019  
 Site Code: 02

Wednesday, October 2, 2019  
 Southbound

Time	Speed Range (mph)																	Total Volume
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	
12:00 AM	0	0	0	1	3	18	23	61	19	6	0	1	0	0	0	0	0	132
1:00 AM	0	0	0	0	0	7	18	11	4	1	0	0	0	0	0	0	0	41
2:00 AM	0	0	0	0	0	1	13	16	13	3	0	0	0	0	0	0	0	46
3:00 AM	0	0	0	0	3	14	16	19	4	2	0	0	0	0	0	0	0	58
4:00 AM	0	0	0	0	1	9	20	26	20	6	2	0	0	0	0	0	0	84
5:00 AM	0	0	1	1	4	25	41	59	24	4	2	0	0	0	0	0	0	161
6:00 AM	0	0	1	8	37	98	125	86	34	3	2	0	0	1	0	0	0	395
7:00 AM	0	4	8	32	85	133	256	127	34	10	0	0	0	0	0	0	0	689
8:00 AM	0	4	12	32	53	167	370	229	62	11	2	0	0	0	0	0	0	942
9:00 AM	0	3	10	32	70	230	320	196	51	10	1	0	1	0	0	0	0	924
10:00 AM	0	3	15	41	105	228	277	172	40	7	0	0	0	0	0	0	0	888
11:00 AM	0	10	15	53	133	279	328	138	40	6	0	0	0	0	0	0	0	1,002
12:00 PM	3	21	52	88	182	255	329	152	36	7	1	0	0	0	0	0	0	1,126
1:00 PM	0	6	33	114	163	280	326	158	34	1	0	0	0	0	0	0	0	1,115
2:00 PM	2	4	16	43	127	318	369	161	36	7	0	0	0	0	0	0	0	1,083
3:00 PM	2	10	21	44	143	297	384	203	31	3	2	0	0	0	0	0	0	1,140
4:00 PM	4	19	83	96	148	271	341	187	47	9	0	0	0	0	0	0	0	1,205
5:00 PM	6	31	87	114	169	262	360	180	29	12	1	0	0	0	0	0	0	1,251
6:00 PM	7	25	74	106	177	285	324	117	28	4	2	1	0	0	0	0	0	1,150
7:00 PM	1	9	23	46	103	198	325	152	37	9	0	2	0	0	0	0	0	905
8:00 PM	0	0	2	15	80	153	275	141	38	6	1	0	0	0	0	0	0	711
9:00 PM	1	1	2	22	41	113	199	156	39	5	1	0	0	0	0	0	0	580
10:00 PM	0	0	0	1	17	61	155	136	32	9	1	0	0	0	0	0	0	412
11:00 PM	0	0	0	0	6	21	75	89	23	6	0	0	0	0	0	0	0	220
<b>Total</b>	<b>26</b>	<b>150</b>	<b>455</b>	<b>889</b>	<b>1,850</b>	<b>3,723</b>	<b>5,269</b>	<b>2,972</b>	<b>755</b>	<b>147</b>	<b>18</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16,260</b>
<b>Percent</b>	<b>0.2%</b>	<b>0.9%</b>	<b>2.8%</b>	<b>5.5%</b>	<b>11.4%</b>	<b>22.9%</b>	<b>32.4%</b>	<b>18.3%</b>	<b>4.6%</b>	<b>0.9%</b>	<b>0.1%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	

Daily Percentile Speed Summary		Speed Statistics	
50th Percentile (Median)	36.0 mph	Mean (Average) Speed	35.1 mph
85th Percentile	41.9 mph	10 mph Pace	31.7 - 41.7 mph
95th Percentile	45.4 mph	Percent in Pace	56.69 %

Location: N Livermore Ave, B/W Las Positas Rd & Portola Ave  
 Date Range: 10/2/2019 to 10/3/2019  
 Site Code: 02

Thursday, October 3, 2019

Northbound

Time	Speed Range (mph)																	Total Volume
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	
12:00 AM	0	0	0	0	1	9	20	29	23	5	0	0	1	0	0	0	0	88
1:00 AM	0	0	0	0	0	6	11	12	4	5	1	0	0	0	0	0	0	39
2:00 AM	0	0	0	0	1	10	15	17	8	3	0	2	0	0	0	0	0	56
3:00 AM	0	0	0	0	0	2	19	25	11	2	1	0	0	0	0	0	0	60
4:00 AM	0	0	0	1	0	11	50	58	49	16	1	3	2	0	0	0	0	191
5:00 AM	0	0	0	2	6	29	92	117	78	24	7	0	1	0	0	0	0	356
6:00 AM	0	0	0	0	34	108	168	150	76	27	4	1	0	0	0	0	0	568
7:00 AM	0	0	0	4	28	132	270	220	74	18	4	0	0	0	0	0	0	750
8:00 AM	0	0	2	12	79	287	308	196	52	13	1	0	0	0	0	0	0	950
9:00 AM	0	1	0	2	45	256	250	157	48	5	2	0	1	0	0	0	0	767
10:00 AM	0	1	1	18	82	263	272	173	40	5	0	0	0	0	0	0	0	855
11:00 AM	0	1	1	23	128	312	282	125	40	12	2	0	0	0	0	0	0	926
12:00 PM	0	7	9	18	168	360	255	95	31	6	3	0	0	0	0	0	0	952
1:00 PM	0	0	1	15	125	365	275	161	43	7	1	0	0	0	0	0	0	993
2:00 PM	0	0	3	43	149	397	317	137	43	7	2	0	0	0	0	0	0	1,098
3:00 PM	0	4	18	70	202	393	388	173	46	12	0	1	0	0	0	0	0	1,307
4:00 PM	0	0	0	6	104	394	297	194	55	9	0	1	0	0	0	0	0	1,060
5:00 PM	0	2	1	24	77	221	355	235	57	15	4	0	1	0	0	0	0	992
6:00 PM	0	1	1	21	120	242	274	154	57	10	1	0	0	0	0	0	0	881
7:00 PM	0	0	1	12	102	222	252	120	35	8	2	1	0	0	0	0	0	755
8:00 PM	0	0	0	0	31	154	220	124	50	13	3	0	0	0	0	0	0	595
9:00 PM	0	0	0	1	22	121	156	123	34	7	0	1	0	0	0	0	0	465
10:00 PM	0	0	0	0	3	42	81	69	25	7	3	0	1	0	0	0	0	231
11:00 PM	0	0	0	1	5	23	29	52	18	5	4	1	0	0	0	0	0	138
<b>Total</b>	<b>0</b>	<b>17</b>	<b>38</b>	<b>273</b>	<b>1,512</b>	<b>4,359</b>	<b>4,656</b>	<b>2,916</b>	<b>997</b>	<b>241</b>	<b>46</b>	<b>11</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>15,073</b>
<b>Percent</b>	<b>0.0%</b>	<b>0.1%</b>	<b>0.3%</b>	<b>1.8%</b>	<b>10.0%</b>	<b>28.9%</b>	<b>30.9%</b>	<b>19.3%</b>	<b>6.6%</b>	<b>1.6%</b>	<b>0.3%</b>	<b>0.1%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>

Daily Percentile Speed Summary		Speed Statistics	
50th Percentile (Median)	36.4 mph	Mean (Average) Speed	36.6 mph
85th Percentile	42.8 mph	10 mph Pace	30.9 - 40.9 mph
95th Percentile	47.0 mph	Percent in Pace	60.1 %

Location: N Livermore Ave, B/W Las Positas Rd & Portola Ave  
 Date Range: 10/2/2019 to 10/3/2019  
 Site Code: 02

Thursday, October 3, 2019  
 Southbound

Time	Speed Range (mph)																	Total Volume
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	
12:00 AM	0	0	0	0	4	32	50	36	7	1	0	0	0	0	0	0	0	130
1:00 AM	0	0	0	0	0	7	14	16	6	0	0	0	0	0	0	0	0	43
2:00 AM	0	0	0	0	0	3	9	25	3	0	0	0	0	0	0	0	0	40
3:00 AM	0	0	0	0	0	6	11	24	19	4	0	0	0	0	0	0	0	64
4:00 AM	0	0	0	1	1	7	31	28	13	3	0	0	0	0	0	0	0	84
5:00 AM	0	0	0	1	7	23	52	63	23	8	1	1	0	0	0	0	0	179
6:00 AM	0	0	1	14	40	79	93	93	31	14	2	0	0	0	0	0	0	367
7:00 AM	0	3	11	23	90	135	270	153	33	9	3	0	0	0	0	0	0	730
8:00 AM	1	1	21	45	87	233	354	158	30	5	0	0	0	0	0	0	0	935
9:00 AM	1	3	11	27	138	215	356	170	22	2	0	0	0	0	0	0	0	945
10:00 AM	0	1	3	40	105	246	286	133	53	9	0	0	0	0	0	0	0	876
11:00 AM	5	24	51	119	144	215	262	202	34	4	1	0	0	0	0	0	0	1,061
12:00 PM	0	6	38	79	203	271	326	176	25	5	4	0	0	0	0	0	0	1,133
1:00 PM	4	11	35	85	187	268	261	155	47	11	2	0	0	0	0	0	0	1,066
2:00 PM	1	15	32	66	134	255	252	153	27	2	0	0	0	0	0	0	0	937
3:00 PM	2	7	17	44	106	255	336	180	42	5	1	0	0	0	0	0	0	995
4:00 PM	9	24	39	80	133	346	338	137	31	2	0	0	0	0	0	0	0	1,139
5:00 PM	2	27	59	69	152	363	357	161	42	7	2	0	0	0	0	0	0	1,241
6:00 PM	10	38	98	124	196	247	295	120	22	1	0	0	0	0	0	0	0	1,151
7:00 PM	1	3	18	82	161	282	242	104	25	2	0	0	0	0	0	0	0	920
8:00 PM	4	1	7	31	72	176	243	94	25	7	0	0	0	0	0	0	0	660
9:00 PM	0	1	3	30	48	119	205	139	46	5	0	0	0	0	0	0	0	596
10:00 PM	0	0	1	4	9	66	116	123	37	7	1	0	0	0	0	0	0	364
11:00 PM	0	0	0	1	6	22	77	73	30	4	0	0	2	0	0	0	0	215
<b>Total</b>	<b>40</b>	<b>165</b>	<b>445</b>	<b>965</b>	<b>2,023</b>	<b>3,871</b>	<b>4,836</b>	<b>2,716</b>	<b>673</b>	<b>117</b>	<b>17</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>15,871</b>
<b>Percent</b>	<b>0.3%</b>	<b>1.0%</b>	<b>2.8%</b>	<b>6.1%</b>	<b>12.7%</b>	<b>24.4%</b>	<b>30.5%</b>	<b>17.1%</b>	<b>4.2%</b>	<b>0.7%</b>	<b>0.1%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>

Daily Percentile Speed Summary		Speed Statistics	
50th Percentile (Median)	35.3 mph	Mean (Average) Speed	34.6 mph
85th Percentile	41.5 mph	10 mph Pace	31.5 - 41.5 mph
95th Percentile	45.1 mph	Percent in Pace	55.6 %



Location: N Livermore Ave, B/W Las Positas Rd & Portola Ave  
 Date Range: 10/2/2019 to 10/3/2019  
 Site Code: 02

**Total Study Average  
 Northbound**

Time	Speed Range (mph)																	Total Volume
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	
12:00 AM	0	0	0	0	2	9	20	28	17	4	1	0	1	0	0	0	1	83
1:00 AM	0	0	0	0	0	6	11	13	5	3	1	0	0	0	0	0	0	39
2:00 AM	0	0	0	0	1	9	11	14	6	2	1	1	0	0	0	0	0	45
3:00 AM	0	0	0	0	3	7	18	26	11	3	1	0	0	0	0	0	0	69
4:00 AM	0	0	0	2	2	13	39	64	43	19	3	2	1	0	0	0	0	188
5:00 AM	0	0	0	2	11	41	79	111	76	24	7	1	1	1	0	0	0	354
6:00 AM	0	0	0	3	32	77	161	159	83	28	4	2	0	0	0	0	0	549
7:00 AM	0	0	0	4	34	169	271	214	73	15	5	0	0	0	0	0	0	785
8:00 AM	0	0	2	7	85	301	306	208	54	12	1	0	1	0	0	0	0	977
9:00 AM	0	1	2	2	72	237	230	139	49	5	2	0	1	0	0	1	0	741
10:00 AM	0	1	1	15	77	247	256	165	46	6	1	0	0	0	0	0	0	815
11:00 AM	0	1	3	18	111	298	284	143	45	8	2	0	0	0	0	0	0	913
12:00 PM	0	4	5	16	137	326	269	119	34	9	2	0	0	0	0	0	0	921
1:00 PM	0	0	4	13	117	377	288	163	46	11	2	0	0	0	0	0	0	1,021
2:00 PM	0	0	2	25	134	381	328	149	46	8	2	1	0	0	0	0	0	1,076
3:00 PM	0	2	10	38	170	356	371	180	48	12	1	1	0	0	0	0	0	1,189
4:00 PM	0	0	2	7	109	346	343	208	56	8	1	1	0	0	0	0	0	1,081
5:00 PM	0	1	1	14	79	240	344	238	60	13	2	1	1	0	0	0	0	994
6:00 PM	0	1	1	12	100	244	284	139	46	8	2	0	0	0	0	0	0	837
7:00 PM	0	0	1	8	73	219	262	121	37	9	2	1	0	0	0	0	0	733
8:00 PM	0	0	0	1	36	143	208	124	49	14	3	1	0	0	0	0	0	579
9:00 PM	0	0	0	2	24	111	176	116	36	6	1	1	1	0	0	0	0	474
10:00 PM	0	0	0	1	8	35	94	79	33	8	2	1	1	0	0	0	0	262
11:00 PM	0	0	0	1	3	17	35	45	18	5	4	1	0	0	0	0	0	129
<b>Total</b>	<b>0</b>	<b>11</b>	<b>34</b>	<b>191</b>	<b>1,420</b>	<b>4,209</b>	<b>4,688</b>	<b>2,965</b>	<b>1,017</b>	<b>240</b>	<b>53</b>	<b>15</b>	<b>8</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>14,854</b>
<b>Percent</b>	<b>0.0%</b>	<b>0.1%</b>	<b>0.2%</b>	<b>1.3%</b>	<b>9.6%</b>	<b>28.3%</b>	<b>31.6%</b>	<b>20.0%</b>	<b>6.8%</b>	<b>1.6%</b>	<b>0.4%</b>	<b>0.1%</b>	<b>0.1%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	

Note: Average only considered on days with 24-hours of data.

Total Study Percentile Speed Summary		Total Study Speed Statistics	
50th Percentile (Median)	36.6 mph	Mean (Average) Speed	36.9 mph
85th Percentile	42.9 mph	10 mph Pace	30.9 - 40.9 mph
95th Percentile	47.0 mph	Percent in Pace	60.6 %

Location: N Livermore Ave, B/W Las Positas Rd & Portola Ave  
Date Range: 10/2/2019 to 10/3/2019  
Site Code: 02

**Total Study Average  
Southbound**

Time	Speed Range (mph)																	Total Volume
	0 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35	35 - 40	40 - 45	45 - 50	50 - 55	55 - 60	60 - 65	65 - 70	70 - 75	75 - 80	80 - 85	85 +	
12:00 AM	0	0	0	1	4	25	37	49	13	4	0	1	0	0	0	0	0	134
1:00 AM	0	0	0	0	0	7	16	14	5	1	0	0	0	0	0	0	0	43
2:00 AM	0	0	0	0	0	2	11	21	8	2	0	0	0	0	0	0	0	44
3:00 AM	0	0	0	0	2	10	14	22	12	3	0	0	0	0	0	0	0	63
4:00 AM	0	0	0	1	1	8	26	27	17	5	1	0	0	0	0	0	0	86
5:00 AM	0	0	1	1	6	24	47	61	24	6	2	1	0	0	0	0	0	173
6:00 AM	0	0	1	11	39	89	109	90	33	9	2	0	0	1	0	0	0	384
7:00 AM	0	4	10	28	88	134	263	140	34	10	2	0	0	0	0	0	0	713
8:00 AM	1	3	17	39	70	200	362	194	46	8	1	0	0	0	0	0	0	941
9:00 AM	1	3	11	30	104	223	338	183	37	6	1	0	1	0	0	0	0	938
10:00 AM	0	2	9	41	105	237	282	153	47	8	0	0	0	0	0	0	0	884
11:00 AM	3	17	33	86	139	247	295	170	37	5	1	0	0	0	0	0	0	1,033
12:00 PM	2	14	45	84	193	263	328	164	31	6	3	0	0	0	0	0	0	1,133
1:00 PM	2	9	34	100	175	274	294	157	41	6	1	0	0	0	0	0	0	1,093
2:00 PM	2	10	24	55	131	287	311	157	32	5	0	0	0	0	0	0	0	1,014
3:00 PM	2	9	19	44	125	276	360	192	37	4	2	0	0	0	0	0	0	1,070
4:00 PM	7	22	61	88	141	309	340	162	39	6	0	0	0	0	0	0	0	1,175
5:00 PM	4	29	73	92	161	313	359	171	36	10	2	0	0	0	0	0	0	1,250
6:00 PM	9	32	86	115	187	266	310	119	25	3	1	1	0	0	0	0	0	1,154
7:00 PM	1	6	21	64	132	240	284	128	31	6	0	1	0	0	0	0	0	914
8:00 PM	2	1	5	23	76	165	259	118	32	7	1	0	0	0	0	0	0	689
9:00 PM	1	1	3	26	45	116	202	148	43	5	1	0	0	0	0	0	0	591
10:00 PM	0	0	1	3	13	64	136	130	35	8	1	0	0	0	0	0	0	391
11:00 PM	0	0	0	1	6	22	76	81	27	5	0	0	1	0	0	0	0	219
<b>Total</b>	<b>37</b>	<b>162</b>	<b>454</b>	<b>933</b>	<b>1,943</b>	<b>3,801</b>	<b>5,059</b>	<b>2,851</b>	<b>722</b>	<b>138</b>	<b>22</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16,129</b>
<b>Percent</b>	<b>0.2%</b>	<b>1.0%</b>	<b>2.8%</b>	<b>5.8%</b>	<b>12.0%</b>	<b>23.6%</b>	<b>31.4%</b>	<b>17.7%</b>	<b>4.5%</b>	<b>0.9%</b>	<b>0.1%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	

Note: Average only considered on days with 24-hours of data.

Total Study Percentile Speed Summary		Total Study Speed Statistics	
50th Percentile (Median)	35.7 mph	Mean (Average) Speed	34.8 mph
85th Percentile	41.7 mph	10 mph Pace	31.5 - 41.5 mph
95th Percentile	45.3 mph	Percent in Pace	56.1 %

Location: N Livermore Ave, B/W Las Positas Rd & Portola Ave  
Date Range: 10/2/2019 - 10/8/2019  
Site Code: 02

Time	Wednesday			Thursday			Friday			Saturday			Sunday			Monday			Tuesday			Mid-Week Average		
	10/2/2019			10/3/2019			10/4/2019			10/5/2019			10/6/2019			10/7/2019			10/8/2019					
	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total
12:00 AM	71	132	203	88	130	218	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80	131	211
1:00 AM	37	41	78	39	43	82	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38	42	80
2:00 AM	31	46	77	56	40	96	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	44	43	87
3:00 AM	73	58	131	60	64	124	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	67	61	128
4:00 AM	180	84	264	191	84	275	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	186	84	270
5:00 AM	346	161	507	356	179	535	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	351	170	521
6:00 AM	528	395	923	568	367	935	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	548	381	929
7:00 AM	817	689	1,506	750	730	1,480	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	784	710	1,493
8:00 AM	999	942	1,941	950	935	1,885	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	975	939	1,913
9:00 AM	709	924	1,633	767	945	1,712	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	738	935	1,673
10:00 AM	769	888	1,657	855	876	1,731	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	812	882	1,694
11:00 AM	893	1,002	1,895	926	1,061	1,987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	910	1,032	1,941
12:00 PM	887	1,126	2,013	952	1,133	2,085	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	920	1,130	2,049
1:00 PM	1,043	1,115	2,158	993	1,066	2,059	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,018	1,091	2,109
2:00 PM	1,049	1,083	2,132	1,098	937	2,035	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,074	1,010	2,084
3:00 PM	1,066	1,140	2,206	1,307	995	2,302	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,187	1,068	2,254
4:00 PM	1,097	1,205	2,302	1,060	1,139	2,199	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,079	1,172	2,251
5:00 PM	991	1,251	2,242	992	1,241	2,233	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	992	1,246	2,238
6:00 PM	788	1,150	1,938	881	1,151	2,032	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	835	1,151	1,985
7:00 PM	705	905	1,610	755	920	1,675	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	730	913	1,643
8:00 PM	557	711	1,268	595	660	1,255	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	576	686	1,262
9:00 PM	476	580	1,056	465	596	1,061	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	471	588	1,059
10:00 PM	291	412	703	231	364	595	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	261	388	649
11:00 PM	116	220	336	138	215	353	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	127	218	345
Total	14,519	16,260	30,779	15,073	15,871	30,944	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14,796	16,066	30,862
Percent	47%	53%	-	49%	51%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	48%	52%	-
AM Peak	08:00	11:00	08:00	08:00	11:00	11:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	08:00	11:00	11:00
Vol.	999	1,002	1,941	950	1,061	1,987	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	975	1,032	1,941
PM Peak	16:00	17:00	16:00	15:00	17:00	15:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15:00	17:00	15:00
Vol.	1,097	1,251	2,302	1,307	1,241	2,302	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,187	1,246	2,254

1. Mid-week average includes data between Tuesday and Thursday.

## **Appendix B**

### **Volume Summary**

Intersection Number:	1												
Traffic Node Number:	1												
Intersection Name:	N. Livermore Avenue & I-580 Westbound Ramps												
Peak Hour:	AM												
Count Date:	10-2-2019												
Scenario:	Chick-fil-A Livermore												
Movements													
Scenario:	North Approach			East Approach			South Approach			West Approach			Total
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	
Existing Conditions	132	92	0	18	9	370	0	81	638	0	0	0	1340
Approved Project Trips													
1934 First Street	0	0	0	0	0	9	0	0	15	0	0	0	24
Chestnut Square	0	0	0	0	0	1	0	0	3	0	0	0	4
First Street Corridor GPA and Auburn Grove Development	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Approved Trips	0	0	0	0	0	10	0	0	18	0	0	0	28
Background Conditions	132	92	0	18	9	380	0	81	656	0	0	0	1368
Project Trips	0	0	0	0	0	21	0	0	21	0	0	0	42
Existing + Project	132	92	0	18	9	391	0	81	659	0	0	0	1382
Background + Project	132	92	0	18	9	401	0	81	677	0	0	0	1410
Cumulative Baseline Conditions	185	181	0	18	9	380	0	81	752	0	0	0	1606
Cumulative + Proj Conditions	185	181	0	18	9	401	0	81	773	0	0	0	1648

Intersection Number:	2												
Traffic Node Number:	2												
Intersection Name:	N. Livermore Avenue & I-580 Eastbound Ramps												
Peak Hour:	AM												
Count Date:	10-2-2019												
Scenario:	Chick-fil-A Livermore												
Movements													
Scenario:	North Approach			East Approach			South Approach			West Approach			Total
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	
Existing Conditions	0	470	15	0	0	0	277	668	0	623	4	39	2096
Approved Project Trips													
1934 First Street	0	0	0	0	0	0	15	0	0	9	0	0	24
Chestnut Square	0	0	0	0	0	0	3	0	0	1	0	0	4
First Street Corridor GPA and Auburn Grove Development	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Approved Trips	0	0	0	0	0	0	18	0	0	10	0	0	28
Background Conditions	0	470	15	0	0	0	295	668	0	633	4	39	2124
Project Trips	0	22	0	0	0	0	7	21	0	7	0	0	57
Existing + Project	0	492	15	0	0	0	284	689	0	630	4	39	2153
Background + Project	0	492	15	0	0	0	302	689	0	640	4	39	2181
Cumulative Baseline Conditions	0	473	47	0	0	0	295	816	0	957	4	39	2631
Cumulative + Proj Conditions	0	495	47	0	0	0	302	837	0	964	4	39	2688



Chick-fil-A Livermore TIA AM Conditions

Intersection Number:	5												
Traffic Node Number:	5												
Intersection Name:	N. Livermore Avenue & Portola Avenue												
Peak Hour:	AM												
Count Date:	10-2-2019												
Scenario:	Chick-fil-A Livermore												
Scenario:	Movements												
	North Approach			East Approach			South Approach			West Approach			Total
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	
Existing Conditions	297	597	80	144	520	39	47	544	194	91	285	272	3110
<b>Approved Project Trips</b>													
1934 First Street	0	9	0	0	0	0	0	30	0	0	0	0	39
Chestnut Square	0	2	0	0	0	0	0	6	0	0	0	0	8
First Street Corridor GPA and Auburn Grove Development	0	0	0	0	8	0	0	0	0	0	0	0	8
Total Approved Trips	0	11	0	0	8	0	0	36	0	0	0	0	55
Background Conditions	297	608	80	144	528	39	47	580	194	91	285	272	3165
Project Trips	6	6	6	6	0	0	0	6	0	0	0	6	36
Existing + Project	303	603	86	150	520	39	47	550	194	91	285	278	3146
Background + Project	303	614	86	150	528	39	47	586	194	91	285	278	3201
Cumulative Baseline Conditions	373	833	80	144	890	40	47	618	326	122	329	343	4145
Cumulative + Proj Conditions	379	839	86	150	890	40	47	624	326	122	329	349	4181

Intersection Number:	1													
Traffic Node Number:	1													
Intersection Name:	N. Livermore Avenue & I-580 Westbound Ramps													
Peak Hour:	PM													
Count Date:	10-2-2019											Date of Analysis: 10/07/19		
Scenario:	Chick-fil-A Livermore													
		Movements												
Scenario:	North Approach			East Approach			South Approach			West Approach			Total	
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT		
Existing Conditions		38	82	0	18	6	305	0	291	593	0	0	0	1333
Approved Project Trips														
	1934 First Street	0	0	0	0	0	35	0	0	12	0	0	0	47
	Chestnut Square	0	0	0	0	0	3	0	0	1	0	0	0	4
	First Street Corridor GPA and Auburn Grove Development	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total Approved Trips	0	0	0	0	0	38	0	0	13	0	0	0	51
Background Conditions		38	82	0	18	6	343	0	291	606	0	0	0	1384
Project Trips		0	0	0	0	0	8	0	0	7	0	0	0	15
Existing + Project		38	82	0	18	6	313	0	291	600	0	0	0	1348
Background + Project		38	82	0	18	6	351	0	291	613	0	0	0	1399
Cumulative Baseline Volumes		57	175	0	18	6	343	0	465	992	0	0	0	2056
Cumulative + Proj Conditions		57	175	0	18	6	351	0	465	999	0	0	0	2071
Intersection Number:	2													
Traffic Node Number:	2													
Intersection Name:	N. Livermore Avenue & I-580 Eastbound Ramps													
Peak Hour:	PM													
Count Date:	10-2-2019											Date of Analysis: 10/07/19		
Scenario:	Chick-fil-A Livermore													
		Movements												
Scenario:	North Approach			East Approach			South Approach			West Approach			Total	
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT		
Existing Conditions		0	377	12	0	0	0	284	679	1	937	6	206	2502
Approved Project Trips														
	1934 First Street	0	0	0	0	0	0	12	0	0	35	0	0	47
	Chestnut Square	0	0	0	0	0	0	2	0	0	3	0	0	5
	First Street Corridor GPA and Auburn Grove Development	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total Approved Trips	0	0	0	0	0	0	14	0	0	38	0	0	52
Background Conditions		0	377	12	0	0	0	298	679	1	975	6	206	2554
Project Trips		0	8	0	0	0	0	14	7	0	16	0	0	45
Existing + Project		0	385	12	0	0	0	298	686	1	953	6	206	2547
Background + Project		0	385	12	0	0	0	312	686	1	991	6	206	2599
Cumulative Baseline Volumes		0	446	16	0	0	0	298	1179	0	1258	6	206	3409
Cumulative + Proj Conditions		0	454	16	0	0	0	312	1186	0	1274	6	206	3454



Intersection Number:	3												
Traffix Node Number:	3												
Intersection Name:	N. Livermore Avenue & Arroyo Plaza												
Peak Hour:	PM												
Count Date:	10-2-2019												
Scenario:	Chick-fil-A Livermore												
Date of Analysis: 10/07/19													
Movements													
Scenario:	North Approach			East Approach			South Approach			West Approach			Total
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	
Existing Conditions	0	1098	159	89	0	60	46	936	0	0	0	0	2388
Approved Project Trips													
	1934 First Street	0	35	0	0	0	0	23	0	0	0	0	58
	Chestnut Square	0	6	0	0	0	0	3	0	0	0	0	9
First Street Corridor GPA and Auburn Grove Development	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Approved Trips	0	41	0	0	0	0	0	26	0	0	0	0	67
Background Conditions	0	1139	159	89	0	60	46	962	0	0	0	0	2455
Project Trips	50	-26	0	0	0	0	0	-14	29	38	0	34	111
Existing + Project	50	1072	159	89	0	60	46	922	29	38	0	34	2499
Background + Project	50	1113	159	89	0	60	46	948	29	38	0	34	2566
Cumulative Baseline Volumes	0	1637	159	89	0	60	46	1260	0	0	0	0	3251
Cumulative + Proj Conditions	50	1611	159	89	0	60	46	1246	29	38	0	34	3362

Intersection Number:	4												
Traffix Node Number:	4												
Intersection Name:	N. Livermore Avenue & Las Positas Road												
Peak Hour:	PM												
Count Date:	10-2-2019												
Scenario:	Chick-fil-A Livermore												
Date of Analysis: 10/07/19													
Movements													
Scenario:	North Approach			East Approach			South Approach			West Approach			Total
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	
Existing Conditions	20	837	239	175	31	420	385	711	99	86	57	124	3184
Approved Project Trips													
	1934 First Street	0	35	0	0	0	0	23	0	0	0	0	58
	Chestnut Square	0	6	0	0	0	0	3	0	0	0	0	9
First Street Corridor GPA and Auburn Grove Development	0	0	0	0	0	0	0	0	0	0	11	0	11
Total Approved Trips	0	41	0	0	0	0	0	26	0	0	11	0	78
Background Conditions	20	878	239	175	31	420	385	737	99	86	68	124	3262
Project Trips	0	14	1	1	0	0	0	14	0	0	0	0	30
Existing + Project	20	851	240	176	31	420	385	725	99	86	57	124	3214
Background + Project	20	892	240	176	31	420	385	751	99	86	68	124	3292
Cumulative Baseline Volumes	25	1242	381	233	54	566	487	913	109	86	68	124	4288
Cumulative + Proj Conditions	25	1256	382	234	54	566	487	927	109	86	68	124	4318

Intersection Number:	5												
Traffic Node Number:	5												
Intersection Name:	N. Livermore Avenue & Portola Avenue												
Peak Hour:	PM												
Count Date:	10-2-2019												Date of Analysis: 10/07/19
Scenario:	Chick-fil-A Livermore												
Movements													
	North Approach			East Approach			South Approach			West Approach			
Scenario:	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	Total
Existing Conditions	407	746	124	91	322	48	39	611	144	123	464	396	3515
Approved Project Trips													
1934 First Street	0	35	0	0	0	0	0	23	0	0	0	0	58
Chestnut Square	0	6	0	0	0	0	0	3	0	0	0	0	9
First Street Corridor GPA and Auburn Grove Development	0	0	0	0	3	0	0	0	0	0	0	0	3
Total Approved Trips	0	41	0	0	3	0	0	26	0	0	0	0	70
Background Conditions	407	787	124	91	325	48	39	637	144	123	464	396	3585
Project Trips	5	5	5	5	0	0	0	5	0	0	0	5	30
Existing + Project	412	751	129	96	322	48	39	616	144	123	464	401	3545
Background + Project	412	792	129	96	325	48	39	642	144	123	464	401	3615
Cumulative Baseline Volumes	617	1004	200	97	466	48	41	788	180	177	701	578	4897
Cumulative + Proj Conditions	622	1009	205	102	466	48	41	793	180	177	701	583	4927








## **Appendix C**

### **Level of Service Calculations**

# HCM Signalized Intersection Capacity Analysis

## 1: Livermore Avenue & I-580 WB Ramp


















Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	370	9	18	638	81	0	0	92	132
Future Volume (vph)	0	0	0	370	9	18	638	81	0	0	92	132
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			4.0	4.0
Lane Util. Factor				0.95	0.95		0.97	1.00			0.95	1.00
Frt				1.00	0.99		1.00	1.00			1.00	0.85
Flt Protected				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1673		3433	1863			3539	1583
Flt Permitted				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1673		3433	1863			3539	1583
Peak-hour factor, PHF	0.25	0.25	0.25	0.81	0.81	0.81	0.89	0.89	0.89	0.73	0.73	0.73
Adj. Flow (vph)	0	0	0	457	11	22	717	91	0	0	126	181
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	0	140
Lane Group Flow (vph)	0	0	0	247	236	0	717	91	0	0	126	41
Turn Type				Perm	NA		Prot	NA			NA	Prot
Protected Phases					8		5	2			6	6
Permitted Phases				8								
Actuated Green, G (s)				12.6	12.6		15.3	31.1			11.8	11.8
Effective Green, g (s)				12.6	12.6		15.3	31.1			11.8	11.8
Actuated g/C Ratio				0.24	0.24		0.30	0.60			0.23	0.23
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				409	407		1015	1120			807	361
v/s Ratio Prot							c0.21	0.05			c0.04	0.03
v/s Ratio Perm				c0.15	0.14							
v/c Ratio				0.60	0.58		0.71	0.08			0.16	0.11
Uniform Delay, d1				17.3	17.2		16.2	4.3			16.0	15.8
Progression Factor				1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2				2.5	2.1		2.3	0.1			0.4	0.6
Delay (s)				19.9	19.3		18.5	4.5			16.4	16.5
Level of Service				B	B		B	A			B	B
Approach Delay (s)		0.0			19.6			16.9			16.4	
Approach LOS		A			B			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			17.6									
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			51.7									
Intersection Capacity Utilization			56.7%									
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 2: Livermore Avenue & I-580 EB Ramp

Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	4	623	0	0	0	0	668	277	15	470	0
Future Volume (vph)	39	4	623	0	0	0	0	668	277	15	470	0
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	4.0	
Lane Util. Factor		0.95	*0.75					0.95		1.00	0.95	
Frt		0.87	0.85					0.96		1.00	1.00	
Flt Protected		0.99	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1529	1188					3383		1770	3539	
Flt Permitted		0.99	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1529	1188					3383		1770	3539	
Peak-hour factor, PHF	0.85	0.85	0.85	0.25	0.25	0.25	0.96	0.96	0.96	0.79	0.79	0.79
Adj. Flow (vph)	46	5	733	0	0	0	0	696	289	19	595	0
RTOR Reduction (vph)	0	115	115	0	0	0	0	44	0	0	0	0
Lane Group Flow (vph)	0	281	273	0	0	0	0	941	0	19	595	0
Turn Type	Prot	NA	Prot					NA		Prot	NA	
Protected Phases	7	4	4					2		1	6	
Permitted Phases												
Actuated Green, G (s)		50.0	50.0					33.9		2.1	40.0	
Effective Green, g (s)		50.0	50.0					33.9		2.1	40.0	
Actuated g/C Ratio		0.51	0.51					0.35		0.02	0.41	
Clearance Time (s)		4.0	4.0					4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		780	606					1170		37	1444	
v/s Ratio Prot			c0.23					c0.28		0.01	c0.17	
v/s Ratio Perm		0.18										
v/c Ratio		0.36	0.45					0.80		0.51	0.41	
Uniform Delay, d1		14.4	15.3					29.0		47.4	20.6	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.3	0.5					4.1		11.5	0.2	
Delay (s)		14.7	15.8					33.1		59.0	20.8	
Level of Service		B	B					C		E	C	
Approach Delay (s)		15.2			0.0			33.1			22.0	
Approach LOS		B			A			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		24.4										
HCM 2000 Volume to Capacity ratio		0.60										
Actuated Cycle Length (s)		98.0										
Intersection Capacity Utilization		56.7%										
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 3: Livermore Avenue & Arroyo Plaza

Chick-fil-a Restaurant - Livermore Avenue



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	11	70	868	17	91	995
Future Volume (vph)	11	70	868	17	91	995
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	1583	3539	1583	3433	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	1583	3539	1583	3433	3539
Peak-hour factor, PHF	0.81	0.81	0.95	0.95	0.96	0.96
Adj. Flow (vph)	14	86	914	18	95	1036
RTOR Reduction (vph)	0	81	0	4	0	0
Lane Group Flow (vph)	14	5	914	14	95	1036
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	5.4	5.4	71.9	71.9	6.5	82.4
Effective Green, g (s)	5.4	5.4	71.9	71.9	6.5	82.4
Actuated g/C Ratio	0.06	0.06	0.75	0.75	0.07	0.86
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	193	89	2656	1188	232	3043
v/s Ratio Prot	c0.00		0.26		0.03	c0.29
v/s Ratio Perm		0.00		0.01		
v/c Ratio	0.07	0.05	0.34	0.01	0.41	0.34
Uniform Delay, d1	42.8	42.8	4.0	3.0	42.8	1.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.3	0.4	0.0	1.2	0.1
Delay (s)	43.0	43.0	4.4	3.0	44.0	1.4
Level of Service	D	D	A	A	D	A
Approach Delay (s)	43.0		4.3			5.0
Approach LOS	D		A			A

### Intersection Summary
























HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	95.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	42.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 4: Livermore Avenue & Las Positas Road






















Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	13	49	260	28	158	119	645	275	168	727	72
Future Volume (vph)	54	13	49	260	28	158	119	645	275	168	727	72
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	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.97	1.00	0.88	1.00	0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1606		3433	1863	2735	1770	3539	1563	3433	3484	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1606		3433	1863	2735	1770	3539	1563	3433	3484	
Peak-hour factor, PHF	0.76	0.76	0.76	0.93	0.93	0.93	0.91	0.91	0.91	0.97	0.97	0.97
Adj. Flow (vph)	71	17	64	280	30	170	131	709	302	173	749	74
RTOR Reduction (vph)	0	58	0	0	0	147	0	0	142	0	5	0
Lane Group Flow (vph)	71	23	0	280	30	23	131	709	160	173	818	0
Confl. Peds. (#/hr)			4			3			2			5
Confl. Bikes (#/hr)			1									
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	8	8		4	4		5	2		1	6	
Permitted Phases						4			2			
Actuated Green, G (s)	9.3	9.3		14.4	14.4	14.4	13.2	56.3	56.3	10.3	53.4	
Effective Green, g (s)	9.3	9.3		14.4	14.4	14.4	13.2	56.3	56.3	10.3	53.4	
Actuated g/C Ratio	0.09	0.09		0.14	0.14	0.14	0.12	0.53	0.53	0.10	0.50	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	154	140		465	252	370	219	1874	827	332	1750	
v/s Ratio Prot	c0.04	0.01		c0.08	0.02		c0.07	c0.20		0.05	c0.23	
v/s Ratio Perm						0.01			0.10			
v/c Ratio	0.46	0.16		0.60	0.12	0.06	0.60	0.38	0.19	0.52	0.47	
Uniform Delay, d1	46.1	44.9		43.3	40.4	40.1	44.0	14.7	13.1	45.7	17.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.2	0.5		2.2	0.2	0.1	4.3	0.6	0.5	1.5	0.9	
Delay (s)	48.3	45.4		45.5	40.6	40.1	48.4	15.3	13.6	47.1	18.1	
Level of Service	D	D		D	D	D	D	B	B	D	B	
Approach Delay (s)		46.8			43.3			18.6			23.1	
Approach LOS		D			D			B			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			26.1				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			106.3				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			53.1%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 5: Livermore Avenue & Portola Avenue

Chick-fil-a Restaurant - Livermore Avenue

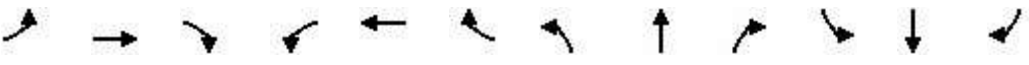






												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	272	285	91	39	520	144	194	544	47	80	597	297
Future Volume (vph)	272	285	91	39	520	144	194	544	47	80	597	297
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3372		1770	3392		1770	3484		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3372		1770	3392		1770	3484		1770	3539	1583
Peak-hour factor, PHF	0.84	0.84	0.84	0.93	0.93	0.93	0.84	0.84	0.84	0.91	0.91	0.91
Adj. Flow (vph)	324	339	108	42	559	155	231	648	56	88	656	326
RTOR Reduction (vph)	0	27	0	0	23	0	0	5	0	0	0	59
Lane Group Flow (vph)	324	420	0	42	691	0	231	699	0	88	656	267
Confl. Peds. (#/hr)			42			26			45			23
Confl. Bikes (#/hr)						1			3			1
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	7	4		3	8		5	2		1	6	6 7
Permitted Phases												
Actuated Green, G (s)	13.2	37.1		3.4	27.3		17.6	41.8		8.4	32.6	49.8
Effective Green, g (s)	13.2	37.1		3.4	27.3		17.6	41.8		8.4	32.6	49.8
Actuated g/C Ratio	0.12	0.35		0.03	0.26		0.16	0.39		0.08	0.31	0.47
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	424	1172		56	867		291	1364		139	1081	738
v/s Ratio Prot	c0.09	0.12		0.02	c0.20		c0.13	0.20		0.05	c0.19	0.17
v/s Ratio Perm												
v/c Ratio	0.76	0.36		0.75	0.80		0.79	0.51		0.63	0.61	0.36
Uniform Delay, d1	45.2	25.9		51.2	37.1		42.8	24.7		47.7	31.6	18.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.0	0.2		42.7	5.1		13.8	1.4		9.1	2.5	0.3
Delay (s)	53.2	26.1		93.9	42.2		56.6	26.1		56.7	34.1	18.6
Level of Service	D	C		F	D		E	C		E	C	B
Approach Delay (s)		37.5			45.1			33.6			31.2	
Approach LOS		D			D			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			36.2			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			106.7			Sum of lost time (s)				16.0		
Intersection Capacity Utilization			67.8%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												



# HCM Signalized Intersection Capacity Analysis

## 1: Livermore Avenue & I-580 WB Ramp


Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	305	6	18	593	291	0	0	82	38
Future Volume (vph)	0	0	0	305	6	18	593	291	0	0	82	38
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			4.0	4.0
Lane Util. Factor				0.95	0.95		0.97	1.00			0.95	1.00
Frpb, ped/bikes				1.00	1.00		1.00	1.00			1.00	1.00
Flpb, ped/bikes				1.00	1.00		1.00	1.00			1.00	1.00
Frt				1.00	0.98		1.00	1.00			1.00	0.85
Flt Protected				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1667		3433	1863			3539	1583
Flt Permitted				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1667		3433	1863			3539	1583
Peak-hour factor, PHF	0.25	0.25	0.25	0.84	0.84	0.84	0.90	0.90	0.90	0.68	0.68	0.68
Adj. Flow (vph)	0	0	0	363	7	21	659	323	0	0	121	56
RTOR Reduction (vph)	0	0	0	0	8	0	0	0	0	0	0	40
Lane Group Flow (vph)	0	0	0	196	187	0	659	323	0	0	121	16
Confl. Peds. (#/hr)						1			1			
Confl. Bikes (#/hr)						1						
Turn Type				Perm	NA		Prot	NA			NA	Prot
Protected Phases					8		5	2			6	6
Permitted Phases				8								
Actuated Green, G (s)				11.9	11.9		15.8	35.2			15.4	15.4
Effective Green, g (s)				11.9	11.9		15.8	35.2			15.4	15.4
Actuated g/C Ratio				0.22	0.22		0.29	0.64			0.28	0.28
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				363	360		984	1190			989	442
v/s Ratio Prot							c0.19	c0.17			0.03	0.01
v/s Ratio Perm				c0.12	0.11							
v/c Ratio				0.54	0.52		0.67	0.27			0.12	0.04
Uniform Delay, d1				19.2	19.1		17.3	4.3			14.8	14.4
Progression Factor				1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2				1.5	1.3		1.7	0.6			0.3	0.1
Delay (s)				20.7	20.3		19.1	4.9			15.1	14.6
Level of Service				C	C		B	A			B	B
Approach Delay (s)		0.0			20.5			14.4			14.9	
Approach LOS		A			C			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			16.0				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			55.1				Sum of lost time (s)		12.0			
Intersection Capacity Utilization			40.2%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 2: Livermore Avenue & I-580 EB Ramp













Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↗					↕		↘	↕	
Traffic Volume (vph)	206	6	937	0	0	0	1	679	284	12	377	0
Future Volume (vph)	206	6	937	0	0	0	1	679	284	12	377	0
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	4.0	
Lane Util. Factor		0.95	0.95					0.95		1.00	0.95	
Frt		0.90	0.85					0.96		1.00	1.00	
Flt Protected		0.98	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1573	1504					3383		1770	3539	
Flt Permitted		0.98	1.00					0.95		0.95	1.00	
Satd. Flow (perm)		1573	1504					3229		1770	3539	
Peak-hour factor, PHF	0.91	0.91	0.91	0.25	0.25	0.25	0.92	0.92	0.92	0.78	0.78	0.78
Adj. Flow (vph)	226	7	1030	0	0	0	1	738	309	15	483	0
RTOR Reduction (vph)	0	97	214	0	0	0	0	74	0	0	0	0
Lane Group Flow (vph)	0	548	404	0	0	0	0	974	0	15	483	0
Turn Type	Prot	NA	Prot				Perm	NA		Prot	NA	
Protected Phases	7	4	4					2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		20.3	20.3					20.7		1.0	25.7	
Effective Green, g (s)		20.3	20.3					20.7		1.0	25.7	
Actuated g/C Ratio		0.38	0.38					0.38		0.02	0.48	
Clearance Time (s)		4.0	4.0					4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		591	565					1237		32	1684	
v/s Ratio Prot			0.27							0.01	c0.14	
v/s Ratio Perm		0.35						c0.30				
v/c Ratio		0.93	0.71					0.79		0.47	0.29	
Uniform Delay, d1		16.1	14.4					14.7		26.2	8.6	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		20.8	4.3					3.4		10.5	0.1	
Delay (s)		36.9	18.7					18.1		36.7	8.7	
Level of Service		D	B					B		D	A	
Approach Delay (s)		28.0			0.0			18.1			9.5	
Approach LOS		C			A			B			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			21.0									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			54.0									Sum of lost time (s) 12.0
Intersection Capacity Utilization			66.2%									ICU Level of Service C
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 3: Livermore Avenue & Arroyo Plaza
























Chick-fil-a Restaurant - Livermore Avenue

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	60	89	936	46	159	1098
Future Volume (vph)	60	89	936	46	159	1098
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.95
Frpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	1560	3539	1583	3433	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	1560	3539	1583	3433	3539
Peak-hour factor, PHF	0.83	0.83	0.88	0.88	0.95	0.95
Adj. Flow (vph)	72	107	1064	52	167	1156
RTOR Reduction (vph)	0	99	0	18	0	0
Lane Group Flow (vph)	72	8	1064	34	167	1156
Confl. Bikes (#/hr)	1					
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	6.1	6.1	53.4	53.4	9.2	66.6
Effective Green, g (s)	6.1	6.1	53.4	53.4	9.2	66.6
Actuated g/C Ratio	0.08	0.08	0.66	0.66	0.11	0.83
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	259	117	2341	1047	391	2920
v/s Ratio Prot	c0.02		c0.30		0.05	c0.33
v/s Ratio Perm		0.01		0.02		
v/c Ratio	0.28	0.07	0.45	0.03	0.43	0.40
Uniform Delay, d1	35.2	34.7	6.6	4.7	33.3	1.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.3	0.6	0.1	0.8	0.1
Delay (s)	35.8	34.9	7.2	4.8	34.0	1.9
Level of Service	D	C	A	A	C	A
Approach Delay (s)	35.3		7.1			6.0
Approach LOS	D		A			A
Intersection Summary						
HCM 2000 Control Delay			8.5	HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio			0.44			
Actuated Cycle Length (s)			80.7	Sum of lost time (s)		12.0
Intersection Capacity Utilization			44.6%	ICU Level of Service		A
Analysis Period (min)			15			
c Critical Lane Group						

# HCM Signalized Intersection Capacity Analysis

## 4: Livermore Avenue & Las Positas Road

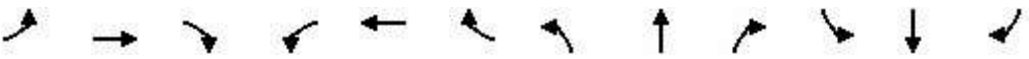
Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	124	57	86	420	31	175	99	711	385	239	837	20
Future Volume (vph)	124	57	86	420	31	175	99	711	385	239	837	20
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	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.97	1.00	0.88	1.00	0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.91		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1681		3433	1863	2741	1770	3539	1562	3433	3525	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1681		3433	1863	2741	1770	3539	1562	3433	3525	
Peak-hour factor, PHF	0.82	0.82	0.82	0.87	0.87	0.87	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	151	70	105	483	36	201	106	765	414	257	900	22
RTOR Reduction (vph)	0	43	0	0	0	162	0	0	234	0	1	0
Lane Group Flow (vph)	151	132	0	483	36	39	106	765	180	257	921	0
Confl. Peds. (#/hr)						2			1			1
Confl. Bikes (#/hr)			1			1			1			
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	8	8		4	4		5	2		1	6	
Permitted Phases						4			2			
Actuated Green, G (s)	15.0	15.0		22.7	22.7	22.7	12.0	51.5	51.5	13.2	52.7	
Effective Green, g (s)	15.0	15.0		22.7	22.7	22.7	12.0	51.5	51.5	13.2	52.7	
Actuated g/C Ratio	0.13	0.13		0.19	0.19	0.19	0.10	0.43	0.43	0.11	0.45	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	224	212		658	357	525	179	1539	679	382	1568	
v/s Ratio Prot	c0.09	0.08		c0.14	0.02		0.06	0.22		c0.07	c0.26	
v/s Ratio Perm						0.01			0.12			
v/c Ratio	0.67	0.62		0.73	0.10	0.07	0.59	0.50	0.27	0.67	0.59	
Uniform Delay, d1	49.4	49.0		45.0	39.4	39.2	50.9	24.1	21.4	50.5	24.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.8	5.6		4.2	0.1	0.1	5.2	1.2	1.0	4.6	1.6	
Delay (s)	57.1	54.6		49.3	39.6	39.3	56.0	25.3	22.3	55.1	26.3	
Level of Service	E	D		D	D	D	E	C	C	E	C	
Approach Delay (s)		55.8			46.0			26.9			32.6	
Approach LOS		E			D			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			35.4			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			118.4			Sum of lost time (s)				16.0		
Intersection Capacity Utilization			62.8%			ICU Level of Service				B		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 5: Livermore Avenue & Portola Avenue

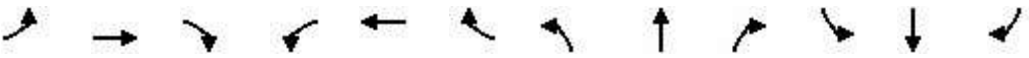






Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↰↱		↰	↰↱		↰	↰↱		↰	↰↱	↰
Traffic Volume (vph)	396	464	123	48	322	91	144	611	39	124	746	407
Future Volume (vph)	396	464	123	48	322	91	144	611	39	124	746	407
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		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.97		1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3406		1770	3402		1770	3503		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3406		1770	3402		1770	3503		1770	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.87	0.87	0.87	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	417	488	129	55	370	105	155	657	42	135	811	442
RTOR Reduction (vph)	0	19	0	0	21	0	0	4	0	0	0	67
Lane Group Flow (vph)	417	598	0	55	454	0	155	695	0	135	811	375
Confl. Peds. (#/hr)			18			7			10			15
Confl. Bikes (#/hr)			1			2						1
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	7	4		3	8		5	2		1	6	6 7
Permitted Phases												
Actuated Green, G (s)	19.6	34.3		6.7	21.4		15.3	49.4		14.0	48.1	71.7
Effective Green, g (s)	19.6	34.3		6.7	21.4		15.3	49.4		14.0	48.1	71.7
Actuated g/C Ratio	0.16	0.28		0.06	0.18		0.13	0.41		0.12	0.40	0.60
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	558	970		98	604		224	1437		205	1413	942
v/s Ratio Prot	c0.12	0.18		0.03	c0.13		c0.09	0.20		0.08	c0.23	0.24
v/s Ratio Perm												
v/c Ratio	0.75	0.62		0.56	0.75		0.69	0.48		0.66	0.57	0.40
Uniform Delay, d1	48.0	37.3		55.4	47.0		50.3	26.1		50.9	28.2	12.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.4	1.2		7.2	5.3		8.9	1.2		7.4	1.7	0.3
Delay (s)	53.5	38.5		62.6	52.3		59.2	27.3		58.3	29.9	13.2
Level of Service	D	D		E	D		E	C		E	C	B
Approach Delay (s)		44.6			53.3			33.1			27.3	
Approach LOS		D			D			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			36.9			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			120.4			Sum of lost time (s)				16.0		
Intersection Capacity Utilization			65.2%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 1: Livermore Avenue & I-580 WB Ramp



















Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	380	9	18	656	81	0	0	92	132
Future Volume (vph)	0	0	0	380	9	18	656	81	0	0	92	132
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			4.0	4.0
Lane Util. Factor				0.95	0.95		0.97	1.00			0.95	1.00
Frt				1.00	0.99		1.00	1.00			1.00	0.85
Flt Protected				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1674		3433	1863			3539	1583
Flt Permitted				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1674		3433	1863			3539	1583
Peak-hour factor, PHF	0.25	0.25	0.25	0.81	0.81	0.81	0.89	0.89	0.89	0.73	0.73	0.73
Adj. Flow (vph)	0	0	0	469	11	22	737	91	0	0	126	181
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	0	140
Lane Group Flow (vph)	0	0	0	253	242	0	737	91	0	0	126	41
Turn Type				Perm	NA		Prot	NA			NA	Prot
Protected Phases					8		5	2			6	6
Permitted Phases				8								
Actuated Green, G (s)				12.7	12.7		15.5	31.1			11.6	11.6
Effective Green, g (s)				12.7	12.7		15.5	31.1			11.6	11.6
Actuated g/C Ratio				0.25	0.25		0.30	0.60			0.22	0.22
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				412	410		1027	1118			792	354
v/s Ratio Prot							c0.21	0.05			c0.04	0.03
v/s Ratio Perm				c0.15	0.14							
v/c Ratio				0.61	0.59		0.72	0.08			0.16	0.11
Uniform Delay, d1				17.4	17.3		16.2	4.3			16.2	16.0
Progression Factor				1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2				2.7	2.3		2.4	0.1			0.4	0.7
Delay (s)				20.1	19.5		18.6	4.5			16.6	16.7
Level of Service				C	B		B	A			B	B
Approach Delay (s)		0.0			19.8			17.1			16.6	
Approach LOS		A			B			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			17.8									
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			51.8									
Intersection Capacity Utilization			57.5%									
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 2: Livermore Avenue & I-580 EB Ramp

Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	4	633	0	0	0	0	668	295	15	470	0
Future Volume (vph)	39	4	633	0	0	0	0	668	295	15	470	0
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	4.0	
Lane Util. Factor		0.95	*0.75					0.95		1.00	0.95	
Frt		0.87	0.85					0.95		1.00	1.00	
Flt Protected		0.99	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1529	1188					3377		1770	3539	
Flt Permitted		0.99	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1529	1188					3377		1770	3539	
Peak-hour factor, PHF	0.85	0.85	0.85	0.25	0.25	0.25	0.96	0.96	0.96	0.79	0.79	0.79
Adj. Flow (vph)	46	5	745	0	0	0	0	696	307	19	595	0
RTOR Reduction (vph)	0	116	116	0	0	0	0	48	0	0	0	0
Lane Group Flow (vph)	0	285	279	0	0	0	0	955	0	19	595	0
Turn Type	Prot	NA	Prot					NA		Prot	NA	
Protected Phases	7	4	4					2		1	6	
Permitted Phases												
Actuated Green, G (s)		49.9	49.9					35.2		2.1	41.3	
Effective Green, g (s)		49.9	49.9					35.2		2.1	41.3	
Actuated g/C Ratio		0.50	0.50					0.35		0.02	0.42	
Clearance Time (s)		4.0	4.0					4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		769	597					1198		37	1473	
v/s Ratio Prot			c0.23					c0.28		0.01	c0.17	
v/s Ratio Perm		0.19										
v/c Ratio		0.37	0.47					0.80		0.51	0.40	
Uniform Delay, d1		15.1	16.0					28.8		48.0	20.3	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.3	0.6					3.8		11.5	0.2	
Delay (s)		15.4	16.6					32.6		59.6	20.5	
Level of Service		B	B					C		E	C	
Approach Delay (s)		16.0			0.0			32.6			21.7	
Approach LOS		B			A			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		24.3										
HCM 2000 Volume to Capacity ratio		0.61										
Actuated Cycle Length (s)		99.2										
Intersection Capacity Utilization		57.5%										
Analysis Period (min)		15										
c Critical Lane Group												



# HCM Signalized Intersection Capacity Analysis

## 3: Livermore Avenue & Arroyo Plaza

Chick-fil-a Restaurant - Livermore Avenue



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	←←	→	↑↑	←	←←	↑↑
Traffic Volume (vph)	11	70	904	17	91	1006
Future Volume (vph)	11	70	904	17	91	1006
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	1583	3539	1583	3433	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	1583	3539	1583	3433	3539
Peak-hour factor, PHF	0.81	0.81	0.95	0.95	0.96	0.96
Adj. Flow (vph)	14	86	952	18	95	1048
RTOR Reduction (vph)	0	81	0	4	0	0
Lane Group Flow (vph)	14	5	952	14	95	1048
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	5.4	5.4	73.9	73.9	6.6	84.5
Effective Green, g (s)	5.4	5.4	73.9	73.9	6.6	84.5
Actuated g/C Ratio	0.06	0.06	0.75	0.75	0.07	0.86
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	189	87	2671	1194	231	3054
v/s Ratio Prot	c0.00		c0.27		0.03	c0.30
v/s Ratio Perm		0.00		0.01		
v/c Ratio	0.07	0.05	0.36	0.01	0.41	0.34
Uniform Delay, d1	43.9	43.8	4.0	3.0	43.8	1.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.3	0.4	0.0	1.2	0.1
Delay (s)	44.0	44.1	4.4	3.0	45.0	1.4
Level of Service	D	D	A	A	D	A
Approach Delay (s)	44.1		4.4			5.0
Approach LOS	D		A			A

### Intersection Summary

HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	97.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		
























c Critical Lane Group



# HCM Signalized Intersection Capacity Analysis

## 4: Livermore Avenue & Las Positas Road






















Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	14	49	260	28	158	119	681	275	168	738	72
Future Volume (vph)	54	14	49	260	28	158	119	681	275	168	738	72
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	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.97	1.00	0.88	1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1645		3433	1863	2787	1770	3539	1583	3433	3492	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1645		3433	1863	2787	1770	3539	1583	3433	3492	
Peak-hour factor, PHF	0.76	0.76	0.76	0.93	0.93	0.93	0.91	0.91	0.91	0.97	0.97	0.97
Adj. Flow (vph)	71	18	64	280	30	170	131	748	302	173	761	74
RTOR Reduction (vph)	0	58	0	0	0	147	0	0	142	0	5	0
Lane Group Flow (vph)	71	24	0	280	30	23	131	748	160	173	830	0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	8	8		4	4		5	2		1	6	
Permitted Phases						4			2			
Actuated Green, G (s)	9.3	9.3		14.4	14.4	14.4	13.2	56.3	56.3	10.3	53.4	
Effective Green, g (s)	9.3	9.3		14.4	14.4	14.4	13.2	56.3	56.3	10.3	53.4	
Actuated g/C Ratio	0.09	0.09		0.14	0.14	0.14	0.12	0.53	0.53	0.10	0.50	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	154	143		465	252	377	219	1874	838	332	1754	
v/s Ratio Prot	c0.04	0.01		c0.08	0.02		c0.07	c0.21		0.05	c0.24	
v/s Ratio Perm						0.01			0.10			
v/c Ratio	0.46	0.17		0.60	0.12	0.06	0.60	0.40	0.19	0.52	0.47	
Uniform Delay, d1	46.1	44.9		43.3	40.4	40.1	44.0	14.9	13.1	45.7	17.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.2	0.5		2.2	0.2	0.1	4.3	0.6	0.5	1.5	0.9	
Delay (s)	48.3	45.5		45.5	40.6	40.1	48.4	15.5	13.6	47.1	18.2	
Level of Service	D	D		D	D	D	D	B	B	D	B	
Approach Delay (s)		46.8			43.3			18.7			23.2	
Approach LOS		D			D			B			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			26.0									
HCM 2000 Level of Service										C		
HCM 2000 Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			106.3							16.0		
Intersection Capacity Utilization			53.4%							A		
ICU Level of Service												
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 5: Livermore Avenue & Portola Avenue

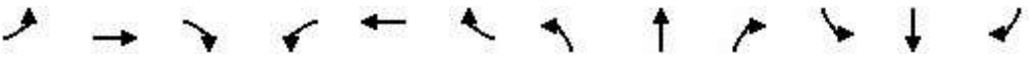






Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	272	285	91	39	528	144	194	580	47	80	608	297
Future Volume (vph)	272	285	91	39	528	144	194	580	47	80	608	297
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		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.96		1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3411		1770	3425		1770	3499		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3411		1770	3425		1770	3499		1770	3539	1583
Peak-hour factor, PHF	0.84	0.84	0.84	0.93	0.93	0.93	0.84	0.84	0.84	0.91	0.91	0.91
Adj. Flow (vph)	324	339	108	42	568	155	231	690	56	88	668	326
RTOR Reduction (vph)	0	27	0	0	22	0	0	5	0	0	0	64
Lane Group Flow (vph)	324	420	0	42	701	0	231	741	0	88	668	262
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	7	4		3	8		5	2		1	6	6 7
Permitted Phases												
Actuated Green, G (s)	13.2	37.2		3.4	27.4		17.6	41.8		8.4	32.6	49.8
Effective Green, g (s)	13.2	37.2		3.4	27.4		17.6	41.8		8.4	32.6	49.8
Actuated g/C Ratio	0.12	0.35		0.03	0.26		0.16	0.39		0.08	0.31	0.47
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	424	1188		56	878		291	1369		139	1080	738
v/s Ratio Prot	c0.09	0.12		0.02	c0.20		c0.13	0.21		0.05	c0.19	0.17
v/s Ratio Perm												
v/c Ratio	0.76	0.35		0.75	0.80		0.79	0.54		0.63	0.62	0.36
Uniform Delay, d1	45.3	25.9		51.3	37.1		42.9	25.1		47.7	31.8	18.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.0	0.2		42.7	5.1		13.8	1.5		9.1	2.7	0.3
Delay (s)	53.3	26.0		93.9	42.2		56.7	26.6		56.8	34.4	18.5
Level of Service	D	C		F	D		E	C		E	C	B
Approach Delay (s)		37.5			45.1			33.7			31.5	
Approach LOS		D			D			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			36.3			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			106.8			Sum of lost time (s)				16.0		
Intersection Capacity Utilization			67.8%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 1: Livermore Avenue & I-580 WB Ramp

Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	343	6	18	606	291	0	0	82	38
Future Volume (vph)	0	0	0	343	6	18	606	291	0	0	82	38
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			4.0	4.0
Lane Util. Factor				0.95	0.95		0.97	1.00			0.95	1.00
Frt				1.00	0.99		1.00	1.00			1.00	0.85
Flt Protected				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1671		3433	1863			3539	1583
Flt Permitted				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1671		3433	1863			3539	1583
Peak-hour factor, PHF	0.25	0.25	0.25	0.84	0.84	0.84	0.90	0.90	0.90	0.68	0.68	0.68
Adj. Flow (vph)	0	0	0	408	7	21	673	323	0	0	121	56
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	0	41
Lane Group Flow (vph)	0	0	0	220	209	0	673	323	0	0	121	15
Turn Type				Perm	NA		Prot	NA			NA	Prot
Protected Phases					8		5	2			6	6
Permitted Phases				8								
Actuated Green, G (s)				12.5	12.5		16.1	35.2			15.1	15.1
Effective Green, g (s)				12.5	12.5		16.1	35.2			15.1	15.1
Actuated g/C Ratio				0.22	0.22		0.29	0.63			0.27	0.27
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				377	375		992	1177			959	429
v/s Ratio Prot							c0.20	c0.17			0.03	0.01
v/s Ratio Perm				c0.13	0.13							
v/c Ratio				0.58	0.56		0.68	0.27			0.13	0.04
Uniform Delay, d1				19.3	19.1		17.5	4.6			15.3	14.9
Progression Factor				1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2				2.3	1.8		1.9	0.6			0.3	0.2
Delay (s)				21.6	20.9		19.4	5.1			15.6	15.1
Level of Service				C	C		B	A			B	B
Approach Delay (s)		0.0			21.3			14.8			15.4	
Approach LOS		A			C			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			16.6				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			55.7				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			41.7%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 2: Livermore Avenue & I-580 EB Ramp

Chick-fil-a Restaurant - Livermore Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↗					↕		↖	↕	
Traffic Volume (vph)	206	6	975	0	0	0	1	679	298	12	377	0
Future Volume (vph)	206	6	975	0	0	0	1	679	298	12	377	0
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	4.0	
Lane Util. Factor		0.95	0.95					0.95		1.00	0.95	
Frt		0.90	0.85					0.95		1.00	1.00	
Flt Protected		0.98	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1571	1504					3377		1770	3539	
Flt Permitted		0.98	1.00					0.95		0.95	1.00	
Satd. Flow (perm)		1571	1504					3224		1770	3539	
Peak-hour factor, PHF	0.91	0.91	0.91	0.25	0.25	0.25	0.92	0.92	0.92	0.78	0.78	0.78
Adj. Flow (vph)	226	7	1071	0	0	0	1	738	324	15	483	0
RTOR Reduction (vph)	0	101	203	0	0	0	0	79	0	0	0	0
Lane Group Flow (vph)	0	560	440	0	0	0	0	984	0	15	483	0
Turn Type	Prot	NA	Prot				Perm	NA		Prot	NA	
Protected Phases	7	4	4					2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		21.2	21.2					20.6		1.0	25.6	
Effective Green, g (s)		21.2	21.2					20.6		1.0	25.6	
Actuated g/C Ratio		0.39	0.39					0.38		0.02	0.47	
Clearance Time (s)		4.0	4.0					4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		607	581					1211		32	1653	
v/s Ratio Prot			0.29							0.01	c0.14	
v/s Ratio Perm		0.36						c0.31				
v/c Ratio		0.92	0.76					0.81		0.47	0.29	
Uniform Delay, d1		16.0	14.6					15.4		26.6	9.0	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		19.6	5.6					4.3		10.5	0.1	
Delay (s)		35.7	20.2					19.6		37.1	9.1	
Level of Service		D	C					B		D	A	
Approach Delay (s)		28.0			0.0			19.6			10.0	
Approach LOS		C			A			B			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			21.8									
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			54.8									
Intersection Capacity Utilization			67.4%									
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 3: Livermore Avenue & Arroyo Plaza

Chick-fil-a Restaurant - Livermore Avenue



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	←←	→	↑↑	←	←←	↑↑
Traffic Volume (vph)	60	89	962	46	159	1139
Future Volume (vph)	60	89	962	46	159	1139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	1583	3539	1583	3433	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	1583	3539	1583	3433	3539
Peak-hour factor, PHF	0.83	0.83	0.88	0.88	0.95	0.95
Adj. Flow (vph)	72	107	1093	52	167	1199
RTOR Reduction (vph)	0	99	0	18	0	0
Lane Group Flow (vph)	72	8	1093	34	167	1199
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	6.0	6.0	53.4	53.4	9.2	66.6
Effective Green, g (s)	6.0	6.0	53.4	53.4	9.2	66.6
Actuated g/C Ratio	0.07	0.07	0.66	0.66	0.11	0.83
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	255	117	2344	1048	391	2924
v/s Ratio Prot	c0.02		c0.31		0.05	c0.34
v/s Ratio Perm		0.01		0.02		
v/c Ratio	0.28	0.07	0.47	0.03	0.43	0.41
Uniform Delay, d1	35.3	34.7	6.6	4.7	33.2	1.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.2	0.7	0.1	0.8	0.1
Delay (s)	35.9	34.9	7.3	4.8	34.0	1.9
Level of Service	D	C	A	A	C	A
Approach Delay (s)	35.3		7.2			5.9
Approach LOS	D		A			A

### Intersection Summary





























HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	80.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 4: Livermore Avenue & Las Positas Road






















Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				 		 		 		 	 	
Traffic Volume (vph)	124	68	86	420	31	175	99	737	385	239	878	20
Future Volume (vph)	124	68	86	420	31	175	99	737	385	239	878	20
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	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.97	1.00	0.88	1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1707		3433	1863	2787	1770	3539	1583	3433	3527	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1707		3433	1863	2787	1770	3539	1583	3433	3527	
Peak-hour factor, PHF	0.82	0.82	0.82	0.87	0.87	0.87	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	151	83	105	483	36	201	106	792	414	257	944	22
RTOR Reduction (vph)	0	37	0	0	0	164	0	0	232	0	1	0
Lane Group Flow (vph)	151	151	0	483	36	37	106	792	182	257	965	0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	8	8		4	4		5	2		1	6	
Permitted Phases						4			2			
Actuated Green, G (s)	15.5	15.5		22.1	22.1	22.1	12.0	52.4	52.4	13.3	53.7	
Effective Green, g (s)	15.5	15.5		22.1	22.1	22.1	12.0	52.4	52.4	13.3	53.7	
Actuated g/C Ratio	0.13	0.13		0.19	0.19	0.19	0.10	0.44	0.44	0.11	0.45	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	229	221		635	345	516	178	1554	695	382	1587	
v/s Ratio Prot	0.09	c0.09		c0.14	0.02		0.06	0.22		c0.07	c0.27	
v/s Ratio Perm						0.01			0.11			
v/c Ratio	0.66	0.69		0.76	0.10	0.07	0.60	0.51	0.26	0.67	0.61	
Uniform Delay, d1	49.4	49.6		46.1	40.4	40.1	51.3	24.2	21.2	50.9	24.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.7	8.5		5.4	0.1	0.1	5.3	1.2	0.9	4.6	1.7	
Delay (s)	56.1	58.1		51.4	40.5	40.2	56.6	25.4	22.1	55.5	26.6	
Level of Service	E	E		D	D	D	E	C	C	E	C	
Approach Delay (s)		57.2			47.8			26.9			32.7	
Approach LOS		E			D			C			C	
Intersection Summary												
HCM 2000 Control Delay	35.9			HCM 2000 Level of Service			D					
HCM 2000 Volume to Capacity ratio	0.67											
Actuated Cycle Length (s)	119.3			Sum of lost time (s)			16.0					
Intersection Capacity Utilization	64.6%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 5: Livermore Avenue & Portola Avenue

Chick-fil-a Restaurant - Livermore Avenue








												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	396	464	123	48	325	91	144	637	39	124	787	407
Future Volume (vph)	396	464	123	48	325	91	144	637	39	124	787	407
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		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.97		1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3428		1770	3423		1770	3509		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3428		1770	3423		1770	3509		1770	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.87	0.87	0.87	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	417	488	129	55	374	105	155	685	42	135	855	442
RTOR Reduction (vph)	0	19	0	0	20	0	0	3	0	0	0	68
Lane Group Flow (vph)	417	598	0	55	459	0	155	724	0	135	855	374
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	7	4		3	8		5	2		1	6	6 7
Permitted Phases												
Actuated Green, G (s)	19.6	34.4		6.7	21.5		15.3	49.4		14.0	48.1	71.7
Effective Green, g (s)	19.6	34.4		6.7	21.5		15.3	49.4		14.0	48.1	71.7
Actuated g/C Ratio	0.16	0.29		0.06	0.18		0.13	0.41		0.12	0.40	0.60
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	558	978		98	610		224	1438		205	1412	941
v/s Ratio Prot	c0.12	0.17		0.03	c0.13		c0.09	0.21		0.08	c0.24	0.24
v/s Ratio Perm												
v/c Ratio	0.75	0.61		0.56	0.75		0.69	0.50		0.66	0.61	0.40
Uniform Delay, d1	48.1	37.3		55.5	47.0		50.3	26.4		51.0	28.7	12.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.4	1.1		7.2	5.2		8.9	1.3		7.4	1.9	0.3
Delay (s)	53.5	38.4		62.6	52.2		59.2	27.7		58.4	30.6	13.2
Level of Service	D	D		E	D		E	C		E	C	B
Approach Delay (s)		44.5			53.3			33.2			27.9	
Approach LOS		D			D			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			37.0			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			120.5			Sum of lost time (s)				16.0		
Intersection Capacity Utilization			66.3%			ICU Level of Service				C		
Analysis Period (min)			15									
c Critical Lane Group												



# HCM Signalized Intersection Capacity Analysis

## 1: Livermore Avenue & I-580 WB Ramp

Chick-fil-a Restaurant - Livermore Avenue


												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	401	9	18	677	81	0	0	92	132
Future Volume (vph)	0	0	0	401	9	18	677	81	0	0	92	132
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			4.0	4.0
Lane Util. Factor				0.95	0.95		0.97	1.00			0.95	1.00
Frt				1.00	0.99		1.00	1.00			1.00	0.85
Flt Protected				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1674		3433	1863			3539	1583
Flt Permitted				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1674		3433	1863			3539	1583
Peak-hour factor, PHF	0.25	0.25	0.25	0.81	0.81	0.81	0.89	0.89	0.89	0.73	0.73	0.73
Adj. Flow (vph)	0	0	0	495	11	22	761	91	0	0	126	181
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	0	0	0	139
Lane Group Flow (vph)	0	0	0	267	255	0	761	91	0	0	126	42
Turn Type				Perm	NA		Prot	NA			NA	Prot
Protected Phases					8		5	2			6	6
Permitted Phases				8								
Actuated Green, G (s)				12.6	12.6		15.9	32.1			12.2	12.2
Effective Green, g (s)				12.6	12.6		15.9	32.1			12.2	12.2
Actuated g/C Ratio				0.24	0.24		0.30	0.61			0.23	0.23
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				401	400		1035	1134			819	366
v/s Ratio Prot							c0.22	0.05			c0.04	0.03
v/s Ratio Perm				c0.16	0.15							
v/c Ratio				0.67	0.64		0.74	0.08			0.15	0.11
Uniform Delay, d1				18.1	18.0		16.5	4.2			16.1	16.0
Progression Factor				1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2				4.1	3.3		2.7	0.1			0.4	0.6
Delay (s)				22.3	21.3		19.3	4.4			16.5	16.6
Level of Service				C	C		B	A			B	B
Approach Delay (s)		0.0			21.8			17.7			16.6	
Approach LOS		A			C			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			18.8									
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			52.7									
Intersection Capacity Utilization			58.4%									
Analysis Period (min)			15									
c Critical Lane Group												



# HCM Signalized Intersection Capacity Analysis

## 2: Livermore Avenue & I-580 EB Ramp























Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↗					↕		↘	↕	
Traffic Volume (vph)	39	4	640	0	0	0	0	689	302	15	492	0
Future Volume (vph)	39	4	640	0	0	0	0	689	302	15	492	0
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	4.0	
Lane Util. Factor		0.95	*0.75					0.95		1.00	0.95	
Frt		0.87	0.85					0.95		1.00	1.00	
Flt Protected		0.99	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1529	1188					3377		1770	3539	
Flt Permitted		0.99	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1529	1188					3377		1770	3539	
Peak-hour factor, PHF	0.85	0.85	0.85	0.25	0.25	0.25	0.96	0.96	0.96	0.79	0.79	0.79
Adj. Flow (vph)	46	5	753	0	0	0	0	718	315	19	623	0
RTOR Reduction (vph)	0	105	105	0	0	0	0	47	0	0	0	0
Lane Group Flow (vph)	0	300	294	0	0	0	0	986	0	19	623	0
Turn Type	Prot	NA	Prot					NA		Prot	NA	
Protected Phases	7	4	4					2		1	6	
Permitted Phases												
Actuated Green, G (s)		50.8	50.8					36.2		2.1	42.3	
Effective Green, g (s)		50.8	50.8					36.2		2.1	42.3	
Actuated g/C Ratio		0.50	0.50					0.36		0.02	0.42	
Clearance Time (s)		4.0	4.0					4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		768	596					1209		36	1480	
v/s Ratio Prot			c0.25					c0.29		0.01	c0.18	
v/s Ratio Perm		0.20										
v/c Ratio		0.39	0.49					0.82		0.53	0.42	
Uniform Delay, d1		15.6	16.6					29.4		49.0	20.8	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.3	0.6					4.4		13.3	0.2	
Delay (s)		15.9	17.3					33.8		62.3	20.9	
Level of Service		B	B					C		E	C	
Approach Delay (s)		16.6			0.0			33.8			22.2	
Approach LOS		B			A			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			25.2									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			101.1									Sum of lost time (s) 12.0
Intersection Capacity Utilization			58.4%									ICU Level of Service B
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 3: Livermore Avenue & Arroyo Plaza






























Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	0	27	11	0	70	57	866	17	91	996	38
Future Volume (vph)	64	0	27	11	0	70	57	866	17	91	996	38
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		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.85		1.00	0.85		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1583		3433	1583		1770	3539	1583	3433	3520	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1583		3433	1583		1770	3539	1583	3433	3520	
Peak-hour factor, PHF	1.00	1.00	1.00	0.81	0.81	0.81	0.95	0.95	0.95	0.96	0.96	0.96
Adj. Flow (vph)	64	0	27	14	0	86	60	912	18	95	1038	40
RTOR Reduction (vph)	0	24	0	0	80	0	0	0	8	0	3	0
Lane Group Flow (vph)	64	3	0	14	6	0	60	912	10	95	1075	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	3.1	6.4		0.8	4.1		2.9	29.9	29.9	3.1	30.1	
Effective Green, g (s)	3.1	6.4		0.8	4.1		2.9	29.9	29.9	3.1	30.1	
Actuated g/C Ratio	0.06	0.11		0.01	0.07		0.05	0.53	0.53	0.06	0.54	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	97	180		48	115		91	1882	842	189	1885	
v/s Ratio Prot	c0.04	0.00		0.00	c0.00		c0.03	0.26		0.03	c0.31	
v/s Ratio Perm									0.01			
v/c Ratio	0.66	0.02		0.29	0.05		0.66	0.48	0.01	0.50	0.57	
Uniform Delay, d1	26.0	22.1		27.4	24.2		26.2	8.3	6.2	25.8	8.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	15.1	0.0		3.4	0.2		16.0	0.9	0.0	2.1	0.4	
Delay (s)	41.1	22.1		30.8	24.4		42.1	9.2	6.2	27.9	9.1	
Level of Service	D	C		C	C		D	A	A	C	A	
Approach Delay (s)		35.5			25.3			11.1			10.7	
Approach LOS		D			C			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			12.4			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			56.2			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			53.1%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 4: Livermore Avenue & Las Positas Road






















Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				 		 		 		 	 	 
Traffic Volume (vph)	54	14	49	260	28	159	119	698	275	169	755	72
Future Volume (vph)	54	14	49	260	28	159	119	698	275	169	755	72
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	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.97	1.00	0.88	1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1645		3433	1863	2787	1770	3539	1583	3433	3493	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1645		3433	1863	2787	1770	3539	1583	3433	3493	
Peak-hour factor, PHF	0.76	0.76	0.76	0.93	0.93	0.93	0.91	0.91	0.91	0.97	0.97	0.97
Adj. Flow (vph)	71	18	64	280	30	171	131	767	302	174	778	74
RTOR Reduction (vph)	0	58	0	0	0	148	0	0	142	0	5	0
Lane Group Flow (vph)	71	24	0	280	30	23	131	767	160	174	847	0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	8	8		4	4		5	2		1	6	
Permitted Phases						4			2			
Actuated Green, G (s)	9.3	9.3		14.4	14.4	14.4	13.2	56.3	56.3	10.3	53.4	
Effective Green, g (s)	9.3	9.3		14.4	14.4	14.4	13.2	56.3	56.3	10.3	53.4	
Actuated g/C Ratio	0.09	0.09		0.14	0.14	0.14	0.12	0.53	0.53	0.10	0.50	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	154	143		465	252	377	219	1874	838	332	1754	
v/s Ratio Prot	c0.04	0.01		c0.08	0.02		c0.07	c0.22		0.05	c0.24	
v/s Ratio Perm						0.01			0.10			
v/c Ratio	0.46	0.17		0.60	0.12	0.06	0.60	0.41	0.19	0.52	0.48	
Uniform Delay, d1	46.1	44.9		43.3	40.4	40.1	44.0	15.0	13.1	45.7	17.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.2	0.5		2.2	0.2	0.1	4.3	0.7	0.5	1.5	1.0	
Delay (s)	48.3	45.5		45.5	40.6	40.1	48.4	15.7	13.6	47.2	18.3	
Level of Service	D	D		D	D	D	D	B	B	D	B	
Approach Delay (s)		46.8			43.3			18.7			23.2	
Approach LOS		D			D			B			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			26.0									
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			106.3									
Intersection Capacity Utilization			53.8%									
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 5: Livermore Avenue & Portola Avenue

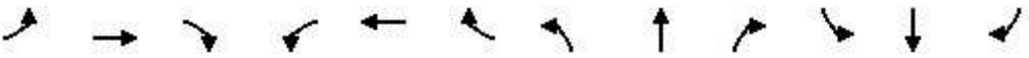






Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	278	285	91	39	528	150	194	586	47	86	614	303
Future Volume (vph)	278	285	91	39	528	150	194	586	47	86	614	303
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		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.96		1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3411		1770	3422		1770	3500		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3411		1770	3422		1770	3500		1770	3539	1583
Peak-hour factor, PHF	0.84	0.84	0.84	0.93	0.93	0.93	0.84	0.84	0.84	0.91	0.91	0.91
Adj. Flow (vph)	331	339	108	42	568	161	231	698	56	95	675	333
RTOR Reduction (vph)	0	27	0	0	24	0	0	5	0	0	0	64
Lane Group Flow (vph)	331	420	0	42	705	0	231	749	0	95	675	269
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	7	4		3	8		5	2		1	6	6 7
Permitted Phases												
Actuated Green, G (s)	13.8	37.8		3.4	27.4		17.6	40.8		8.5	31.7	49.5
Effective Green, g (s)	13.8	37.8		3.4	27.4		17.6	40.8		8.5	31.7	49.5
Actuated g/C Ratio	0.13	0.35		0.03	0.26		0.17	0.38		0.08	0.30	0.46
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	444	1210		56	880		292	1340		141	1053	735
v/s Ratio Prot	c0.10	0.12		0.02	c0.21		c0.13	0.21		0.05	c0.19	0.17
v/s Ratio Perm												
v/c Ratio	0.75	0.35		0.75	0.80		0.79	0.56		0.67	0.64	0.37
Uniform Delay, d1	44.7	25.3		51.1	37.0		42.7	25.8		47.7	32.5	18.4
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.7	0.2		42.7	5.3		13.6	1.7		12.0	3.0	0.3
Delay (s)	51.3	25.4		93.8	42.3		56.3	27.5		59.6	35.5	18.7
Level of Service	D	C		F	D		E	C		E	D	B
Approach Delay (s)		36.5			45.1			34.2			32.5	
Approach LOS		D			D			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		36.5			HCM 2000 Level of Service			D				
HCM 2000 Volume to Capacity ratio		0.73										
Actuated Cycle Length (s)		106.5			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		68.4%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 1: Livermore Avenue & I-580 WB Ramp

Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	351	6	18	613	291	0	0	82	38
Future Volume (vph)	0	0	0	351	6	18	613	291	0	0	82	38
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			4.0	4.0
Lane Util. Factor				0.95	0.95		0.97	1.00			0.95	1.00
Frt				1.00	0.99		1.00	1.00			1.00	0.85
Flt Protected				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1671		3433	1863			3539	1583
Flt Permitted				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1671		3433	1863			3539	1583
Peak-hour factor, PHF	0.25	0.25	0.25	0.84	0.84	0.84	0.90	0.90	0.90	0.68	0.68	0.68
Adj. Flow (vph)	0	0	0	418	7	21	681	323	0	0	121	56
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	0	41
Lane Group Flow (vph)	0	0	0	226	213	0	681	323	0	0	121	15
Turn Type				Perm	NA		Prot	NA			NA	Prot
Protected Phases					8		5	2			6	6
Permitted Phases				8								
Actuated Green, G (s)				12.7	12.7		16.3	35.2			14.9	14.9
Effective Green, g (s)				12.7	12.7		16.3	35.2			14.9	14.9
Actuated g/C Ratio				0.23	0.23		0.29	0.63			0.27	0.27
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				381	379		1001	1173			943	421
v/s Ratio Prot							c0.20	c0.17			0.03	0.01
v/s Ratio Perm				c0.13	0.13							
v/c Ratio				0.59	0.56		0.68	0.28			0.13	0.04
Uniform Delay, d1				19.3	19.1		17.5	4.6			15.6	15.2
Progression Factor				1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2				2.5	1.9		1.9	0.6			0.3	0.2
Delay (s)				21.8	21.0		19.4	5.2			15.8	15.3
Level of Service				C	C		B	A			B	B
Approach Delay (s)		0.0			21.4			14.8			15.7	
Approach LOS		A			C			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			16.7				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			55.9				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			42.1%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 2: Livermore Avenue & I-580 EB Ramp























Chick-fil-a Restaurant - Livermore Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↗					↕		↖	↕	
Traffic Volume (vph)	206	6	991	0	0	0	1	686	312	12	385	0
Future Volume (vph)	206	6	991	0	0	0	1	686	312	12	385	0
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	4.0	
Lane Util. Factor		0.95	0.95					0.95		1.00	0.95	
Frt		0.90	0.85					0.95		1.00	1.00	
Flt Protected		0.98	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1570	1504					3373		1770	3539	
Flt Permitted		0.98	1.00					0.95		0.95	1.00	
Satd. Flow (perm)		1570	1504					3221		1770	3539	
Peak-hour factor, PHF	0.91	0.91	0.91	0.25	0.25	0.25	0.92	0.92	0.92	0.78	0.78	0.78
Adj. Flow (vph)	226	7	1089	0	0	0	1	746	339	15	494	0
RTOR Reduction (vph)	0	103	210	0	0	0	0	85	0	0	0	0
Lane Group Flow (vph)	0	566	443	0	0	0	0	1001	0	15	494	0
Turn Type	Prot	NA	Prot				Perm	NA		Prot	NA	
Protected Phases	7	4	4					2		1	6	
Permitted Phases							2					
Actuated Green, G (s)		20.2	20.2					21.0		1.0	26.0	
Effective Green, g (s)		20.2	20.2					21.0		1.0	26.0	
Actuated g/C Ratio		0.37	0.37					0.39		0.02	0.48	
Clearance Time (s)		4.0	4.0					4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		585	560					1247		32	1697	
v/s Ratio Prot			0.29							0.01	c0.14	
v/s Ratio Perm		0.36						c0.31				
v/c Ratio		0.97	0.79					0.80		0.47	0.29	
Uniform Delay, d1		16.7	15.1					14.8		26.3	8.5	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		28.9	7.5					3.8		10.5	0.1	
Delay (s)		45.6	22.7					18.6		36.8	8.6	
Level of Service		D	C					B		D	A	
Approach Delay (s)		34.3			0.0			18.6			9.5	
Approach LOS		C			A			B			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			24.1									
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			54.2									
Intersection Capacity Utilization			68.4%									
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 3: Livermore Avenue & Arroyo Plaza

Chick-fil-a Restaurant - Livermore Avenue




























												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	0	38	60	0	89	29	948	46	159	1113	50
Future Volume (vph)	34	0	38	60	0	89	29	948	46	159	1113	50
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		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.85		1.00	0.85		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1583		3433	1583		1770	3539	1583	3433	3516	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1583		3433	1583		1770	3539	1583	3433	3516	
Peak-hour factor, PHF	1.00	1.00	1.00	0.83	0.83	0.83	0.88	0.88	0.88	0.95	0.95	0.95
Adj. Flow (vph)	34	0	38	72	0	107	33	1077	52	167	1172	53
RTOR Reduction (vph)	0	36	0	0	99	0	0	0	25	0	3	0
Lane Group Flow (vph)	34	2	0	72	8	0	33	1077	27	167	1222	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	1.8	3.2		2.9	4.3		1.8	30.0	30.0	4.7	32.9	
Effective Green, g (s)	1.8	3.2		2.9	4.3		1.8	30.0	30.0	4.7	32.9	
Actuated g/C Ratio	0.03	0.06		0.05	0.08		0.03	0.53	0.53	0.08	0.58	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	56	89		175	119		56	1869	836	284	2036	
v/s Ratio Prot	0.02	0.00		c0.02	c0.01		0.02	0.30		c0.05	c0.35	
v/s Ratio Perm									0.02			
v/c Ratio	0.61	0.02		0.41	0.07		0.59	0.58	0.03	0.59	0.60	
Uniform Delay, d1	27.2	25.3		26.1	24.4		27.1	9.1	6.4	25.1	7.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	17.2	0.1		1.6	0.2		14.9	1.3	0.1	3.1	0.5	
Delay (s)	44.4	25.4		27.7	24.6		42.0	10.4	6.5	28.2	8.2	
Level of Service	D	C		C	C		D	B	A	C	A	
Approach Delay (s)		34.4			25.9			11.1			10.6	
Approach LOS		C			C			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			12.4			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			56.8			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			55.1%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												



# HCM Signalized Intersection Capacity Analysis

## 4: Livermore Avenue & Las Positas Road

Chick-fil-a Restaurant - Livermore Avenue






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				 		 		 		 	 	
Traffic Volume (vph)	124	68	86	420	31	176	99	751	385	240	892	20
Future Volume (vph)	124	68	86	420	31	176	99	751	385	240	892	20
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	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.97	1.00	0.88	1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1707		3433	1863	2787	1770	3539	1583	3433	3527	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1707		3433	1863	2787	1770	3539	1583	3433	3527	
Peak-hour factor, PHF	0.82	0.82	0.82	0.87	0.87	0.87	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	151	83	105	483	36	202	106	808	414	258	959	22
RTOR Reduction (vph)	0	37	0	0	0	165	0	0	232	0	1	0
Lane Group Flow (vph)	151	151	0	483	36	37	106	808	182	258	980	0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	8	8		4	4		5	2		1	6	
Permitted Phases						4			2			
Actuated Green, G (s)	15.5	15.5		22.1	22.1	22.1	12.0	52.4	52.4	13.3	53.7	
Effective Green, g (s)	15.5	15.5		22.1	22.1	22.1	12.0	52.4	52.4	13.3	53.7	
Actuated g/C Ratio	0.13	0.13		0.19	0.19	0.19	0.10	0.44	0.44	0.11	0.45	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	229	221		635	345	516	178	1554	695	382	1587	
v/s Ratio Prot	0.09	c0.09		c0.14	0.02		0.06	0.23		c0.08	c0.28	
v/s Ratio Perm						0.01			0.11			
v/c Ratio	0.66	0.69		0.76	0.10	0.07	0.60	0.52	0.26	0.68	0.62	
Uniform Delay, d1	49.4	49.6		46.1	40.4	40.1	51.3	24.3	21.2	50.9	25.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.7	8.5		5.4	0.1	0.1	5.3	1.2	0.9	4.7	1.8	
Delay (s)	56.1	58.1		51.4	40.5	40.2	56.6	25.6	22.1	55.6	26.8	
Level of Service	E	E		D	D	D	E	C	C	E	C	
Approach Delay (s)		57.2			47.7			27.0			32.8	
Approach LOS		E			D			C			C	
Intersection Summary												
HCM 2000 Control Delay	35.9			HCM 2000 Level of Service			D					
HCM 2000 Volume to Capacity ratio	0.67											
Actuated Cycle Length (s)	119.3			Sum of lost time (s)			16.0					
Intersection Capacity Utilization	64.9%			ICU Level of Service			C					
Analysis Period (min)	15											
c Critical Lane Group												



# HCM Signalized Intersection Capacity Analysis

## 5: Livermore Avenue & Portola Avenue








Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	401	464	123	48	325	96	144	642	39	129	792	412
Future Volume (vph)	401	464	123	48	325	96	144	642	39	129	792	412
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		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.97		1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3428		1770	3419		1770	3509		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3428		1770	3419		1770	3509		1770	3539	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.87	0.87	0.87	0.93	0.93	0.93	0.92	0.92	0.92
Adj. Flow (vph)	422	488	129	55	374	110	155	690	42	140	861	448
RTOR Reduction (vph)	0	19	0	0	21	0	0	3	0	0	0	68
Lane Group Flow (vph)	422	598	0	55	463	0	155	729	0	140	861	380
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	7	4		3	8		5	2		1	6	6 7
Permitted Phases												
Actuated Green, G (s)	19.7	34.7		6.7	21.7		15.4	49.5		14.2	48.3	72.0
Effective Green, g (s)	19.7	34.7		6.7	21.7		15.4	49.5		14.2	48.3	72.0
Actuated g/C Ratio	0.16	0.29		0.06	0.18		0.13	0.41		0.12	0.40	0.59
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	558	982		97	612		225	1434		207	1411	941
v/s Ratio Prot	c0.12	0.17		0.03	c0.14		c0.09	0.21		0.08	c0.24	0.24
v/s Ratio Perm												
v/c Ratio	0.76	0.61		0.57	0.76		0.69	0.51		0.68	0.61	0.40
Uniform Delay, d1	48.4	37.3		55.8	47.2		50.6	26.7		51.2	28.9	13.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.8	1.1		7.4	5.3		8.5	1.3		8.4	2.0	0.3
Delay (s)	54.2	38.4		63.2	52.5		59.0	28.0		59.7	30.9	13.4
Level of Service	D	D		E	D		E	C		E	C	B
Approach Delay (s)		44.8			53.6			33.4			28.3	
Approach LOS		D			D			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			37.3				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			121.1				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			66.7%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 1: Livermore Avenue & I-580 WB Ramp



















Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	380	9	18	752	81	0	0	181	185
Future Volume (vph)	0	0	0	380	9	18	752	81	0	0	181	185
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			4.0	4.0
Lane Util. Factor				0.95	0.95		0.97	1.00			0.95	1.00
Frt				1.00	0.99		1.00	1.00			1.00	0.85
Flt Protected				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1673		3433	1863			3539	1583
Flt Permitted				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1673		3433	1863			3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	380	9	18	752	81	0	0	181	185
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	0	0	0	135
Lane Group Flow (vph)	0	0	0	205	196	0	752	81	0	0	181	50
Turn Type				Perm	NA		Prot	NA			NA	Prot
Protected Phases					8		5	2			6	6
Permitted Phases				8								
Actuated Green, G (s)				10.8	10.8		15.8	34.1			14.3	14.3
Effective Green, g (s)				10.8	10.8		15.8	34.1			14.3	14.3
Actuated g/C Ratio				0.20	0.20		0.30	0.64			0.27	0.27
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				343	341		1025	1200			956	427
v/s Ratio Prot							c0.22	0.04			c0.05	0.03
v/s Ratio Perm				c0.12	0.12							
v/c Ratio				0.60	0.57		0.73	0.07			0.19	0.12
Uniform Delay, d1				19.1	19.0		16.7	3.5			14.8	14.5
Progression Factor				1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2				2.8	2.3		2.8	0.1			0.4	0.6
Delay (s)				21.9	21.3		19.4	3.6			15.3	15.1
Level of Service				C	C		B	A			B	B
Approach Delay (s)		0.0			21.6			17.9			15.2	
Approach LOS		A			C			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			18.2				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			52.9				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			68.2%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 2: Livermore Avenue & I-580 EB Ramp

Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	4	957	0	0	0	0	816	295	47	473	0
Future Volume (vph)	39	4	957	0	0	0	0	816	295	47	473	0
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	4.0	
Lane Util. Factor		0.95	*0.75					0.95		1.00	0.95	
Frt		0.86	0.85					0.96		1.00	1.00	
Flt Protected		1.00	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1521	1188					3398		1770	3539	
Flt Permitted		1.00	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1521	1188					3398		1770	3539	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	39	4	957	0	0	0	0	816	295	47	473	0
RTOR Reduction (vph)	0	173	173	0	0	0	0	34	0	0	0	0
Lane Group Flow (vph)	0	329	325	0	0	0	0	1077	0	47	473	0
Turn Type	Prot	NA	Prot					NA		Prot	NA	
Protected Phases	7	4	4					2		1	6	
Permitted Phases												
Actuated Green, G (s)		49.6	49.6					40.7		4.6	49.3	
Effective Green, g (s)		49.6	49.6					40.7		4.6	49.3	
Actuated g/C Ratio		0.46	0.46					0.38		0.04	0.46	
Clearance Time (s)		4.0	4.0					4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		705	551					1293		76	1632	
v/s Ratio Prot			c0.27					c0.32		c0.03	0.13	
v/s Ratio Perm		0.22										
v/c Ratio		0.47	0.59					0.83		0.62	0.29	
Uniform Delay, d1		19.6	21.1					30.0		50.3	17.9	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.5	1.6					4.8		14.1	0.1	
Delay (s)		20.1	22.8					34.8		64.3	18.0	
Level of Service		C	C					C		E	B	
Approach Delay (s)		21.4			0.0			34.8			22.2	
Approach LOS		C			A			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			27.2					HCM 2000 Level of Service			C	
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			106.9					Sum of lost time (s)		12.0		
Intersection Capacity Utilization			68.2%					ICU Level of Service		C		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 3: Livermore Avenue & Arroyo Plaza

Chick-fil-a Restaurant - Livermore Avenue



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	←←	→	↑↑	←	←←	↑↑
Traffic Volume (vph)	11	70	1042	17	91	1317
Future Volume (vph)	11	70	1042	17	91	1317
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	1583	3539	1583	3433	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	1583	3539	1583	3433	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	11	70	1042	17	91	1317
RTOR Reduction (vph)	0	66	0	4	0	0
Lane Group Flow (vph)	11	4	1042	13	91	1317
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	5.3	5.3	74.2	74.2	6.5	84.7
Effective Green, g (s)	5.3	5.3	74.2	74.2	6.5	84.7
Actuated g/C Ratio	0.05	0.05	0.76	0.76	0.07	0.86
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	185	85	2679	1198	227	3058
v/s Ratio Prot	c0.00		0.29		0.03	c0.37
v/s Ratio Perm		0.00		0.01		
v/c Ratio	0.06	0.04	0.39	0.01	0.40	0.43
Uniform Delay, d1	44.0	43.9	4.1	2.9	43.9	1.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2	0.4	0.0	1.2	0.1
Delay (s)	44.1	44.2	4.5	2.9	45.0	1.5
Level of Service	D	D	A	A	D	A
Approach Delay (s)	44.2		4.5			4.3
Approach LOS	D		A			A

### Intersection Summary
























HCM 2000 Control Delay	5.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	98.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 4: Livermore Avenue & Las Positas Road






















Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	14	49	271	49	168	130	789	277	219	987	86
Future Volume (vph)	54	14	49	271	49	168	130	789	277	219	987	86
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	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.97	1.00	0.88	1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1645		3433	1863	2787	1770	3539	1583	3433	3497	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1645		3433	1863	2787	1770	3539	1583	3433	3497	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	54	14	49	271	49	168	130	789	277	219	987	86
RTOR Reduction (vph)	0	46	0	0	0	146	0	0	125	0	5	0
Lane Group Flow (vph)	54	17	0	271	49	22	130	789	152	219	1068	0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	8	8		4	4		5	2		1	6	
Permitted Phases						4			2			
Actuated Green, G (s)	6.9	6.9		13.8	13.8	13.8	13.0	58.6	58.6	11.8	57.4	
Effective Green, g (s)	6.9	6.9		13.8	13.8	13.8	13.0	58.6	58.6	11.8	57.4	
Actuated g/C Ratio	0.06	0.06		0.13	0.13	0.13	0.12	0.55	0.55	0.11	0.54	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	114	105		442	240	359	214	1936	866	378	1874	
v/s Ratio Prot	c0.03	0.01		c0.08	0.03		c0.07	0.22		0.06	c0.31	
v/s Ratio Perm						0.01			0.10			
v/c Ratio	0.47	0.16		0.61	0.20	0.06	0.61	0.41	0.18	0.58	0.57	
Uniform Delay, d1	48.3	47.4		44.1	41.7	41.0	44.6	14.1	12.1	45.3	16.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.1	0.7		2.5	0.4	0.1	4.8	0.6	0.4	2.2	1.3	
Delay (s)	51.4	48.1		46.6	42.2	41.0	49.4	14.8	12.6	47.4	17.9	
Level of Service	D	D		D	D	D	D	B	B	D	B	
Approach Delay (s)		49.6			44.3			18.0			22.9	
Approach LOS		D			D			B			C	
Intersection Summary												
HCM 2000 Control Delay	25.4			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.57											
Actuated Cycle Length (s)	107.1			Sum of lost time (s)			16.0					
Intersection Capacity Utilization	61.6%			ICU Level of Service			B					
Analysis Period (min)	15											
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 5: Livermore Avenue & Portola Avenue

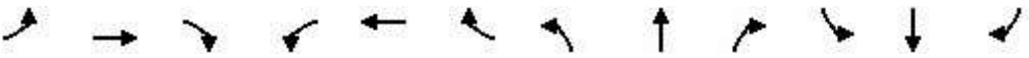






Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	343	329	122	40	890	144	326	618	47	80	833	373
Future Volume (vph)	343	329	122	40	890	144	326	618	47	80	833	373
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		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.96		1.00	0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3396		1770	3465		1770	3502		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3396		1770	3465		1770	3502		1770	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	343	329	122	40	890	144	326	618	47	80	833	373
RTOR Reduction (vph)	0	33	0	0	12	0	0	5	0	0	0	53
Lane Group Flow (vph)	343	418	0	40	1022	0	326	660	0	80	833	320
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	7	4		3	8		5	2		1	6	6 7
Permitted Phases												
Actuated Green, G (s)	12.0	42.0		3.6	33.6		21.0	43.1		7.7	29.8	45.8
Effective Green, g (s)	12.0	42.0		3.6	33.6		21.0	43.1		7.7	29.8	45.8
Actuated g/C Ratio	0.11	0.37		0.03	0.30		0.19	0.38		0.07	0.27	0.41
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	366	1268		56	1035		330	1342		121	938	645
v/s Ratio Prot	c0.10	0.12		0.02	c0.29		c0.18	0.19		0.05	c0.24	0.20
v/s Ratio Perm												
v/c Ratio	0.94	0.33		0.71	0.99		0.99	0.49		0.66	0.89	0.50
Uniform Delay, d1	49.8	25.1		53.9	39.2		45.6	26.3		51.1	39.7	24.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	31.0	0.2		35.0	24.7		45.8	1.3		12.8	12.2	0.6
Delay (s)	80.9	25.3		88.9	63.9		91.4	27.6		63.8	51.9	25.3
Level of Service	F	C		F	E		F	C		E	D	C
Approach Delay (s)		49.3			64.8			48.6			45.0	
Approach LOS		D			E			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			51.8			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.95									
Actuated Cycle Length (s)			112.4			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			93.4%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 1: Livermore Avenue & I-580 WB Ramp

Chick-fil-a Restaurant - Livermore Avenue


												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	343	6	18	992	465	0	0	175	57
Future Volume (vph)	0	0	0	343	6	18	992	465	0	0	175	57
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			4.0	4.0
Lane Util. Factor				0.95	0.95		0.97	1.00			0.95	1.00
Frt				1.00	0.99		1.00	1.00			1.00	0.85
Flt Protected				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1671		3433	1863			3539	1583
Flt Permitted				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1671		3433	1863			3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	343	6	18	992	465	0	0	175	57
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	0	44
Lane Group Flow (vph)	0	0	0	185	175	0	992	465	0	0	175	13
Turn Type				Perm	NA		Prot	NA			NA	Prot
Protected Phases					8		5	2			6	6
Permitted Phases				8								
Actuated Green, G (s)				10.8	10.8		22.5	40.1			13.6	13.6
Effective Green, g (s)				10.8	10.8		22.5	40.1			13.6	13.6
Actuated g/C Ratio				0.18	0.18		0.38	0.68			0.23	0.23
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				308	306		1311	1268			817	365
v/s Ratio Prot							c0.29	c0.25			0.05	0.01
v/s Ratio Perm				c0.11	0.11							
v/c Ratio				0.60	0.57		0.76	0.37			0.21	0.04
Uniform Delay, d1				22.1	21.9		15.8	4.0			18.3	17.6
Progression Factor				1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2				3.3	2.6		2.5	0.8			0.6	0.2
Delay (s)				25.4	24.5		18.4	4.8			18.9	17.8
Level of Service				C	C		B	A			B	B
Approach Delay (s)		0.0			24.9			14.0			18.6	
Approach LOS		A			C			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			16.5				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			58.9				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			93.8%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												



# HCM Signalized Intersection Capacity Analysis

## 2: Livermore Avenue & I-580 EB Ramp

Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↗					↕		↖	↕	
Traffic Volume (vph)	206	6	1258	0	0	0	0	1179	298	16	446	0
Future Volume (vph)	206	6	1258	0	0	0	0	1179	298	16	446	0
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	4.0	
Lane Util. Factor		0.95	0.95					0.95		1.00	0.95	
Frt		0.89	0.85					0.97		1.00	1.00	
Flt Protected		0.99	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1559	1504					3432		1770	3539	
Flt Permitted		0.99	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1559	1504					3432		1770	3539	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	206	6	1258	0	0	0	0	1179	298	16	446	0
RTOR Reduction (vph)	0	141	256	0	0	0	0	35	0	0	0	0
Lane Group Flow (vph)	0	599	474	0	0	0	0	1442	0	16	446	0
Turn Type	Prot	NA	Prot					NA		Prot	NA	
Protected Phases	7	4	4					2		1	6	
Permitted Phases												
Actuated Green, G (s)		19.1	19.1					24.1		1.0	29.1	
Effective Green, g (s)		19.1	19.1					24.1		1.0	29.1	
Actuated g/C Ratio		0.34	0.34					0.43		0.02	0.52	
Clearance Time (s)		4.0	4.0					4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		529	511					1471		31	1832	
v/s Ratio Prot			0.32					c0.42		0.01	c0.13	
v/s Ratio Perm		0.38										
v/c Ratio		1.13	0.93					0.98		0.52	0.24	
Uniform Delay, d1		18.6	17.9					15.8		27.4	7.5	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		81.2	23.0					18.9		13.7	0.1	
Delay (s)		99.8	40.9					34.7		41.1	7.5	
Level of Service		F	D					C		D	A	
Approach Delay (s)		70.5			0.0			34.7			8.7	
Approach LOS		E			A			C			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			46.6					HCM 2000 Level of Service			D	
HCM 2000 Volume to Capacity ratio			1.04									
Actuated Cycle Length (s)			56.2					Sum of lost time (s)		12.0		
Intersection Capacity Utilization			93.8%					ICU Level of Service		F		
Analysis Period (min)			15									
c Critical Lane Group												



# HCM Signalized Intersection Capacity Analysis

## 3: Livermore Avenue & Arroyo Plaza

Chick-fil-a Restaurant - Livermore Avenue



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	←←	→	↑↑	←	←←	↑↑
Traffic Volume (vph)	60	89	1260	46	159	1637
Future Volume (vph)	60	89	1260	46	159	1637
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	1.00	0.95	1.00	0.97	0.95
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3433	1583	3539	1583	3433	3539
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3433	1583	3539	1583	3433	3539
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	60	89	1260	46	159	1637
RTOR Reduction (vph)	0	83	0	15	0	0
Lane Group Flow (vph)	60	6	1260	31	159	1637
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	5.9	5.9	57.3	57.3	8.8	70.1
Effective Green, g (s)	5.9	5.9	57.3	57.3	8.8	70.1
Actuated g/C Ratio	0.07	0.07	0.68	0.68	0.10	0.83
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	241	111	2414	1079	359	2953
v/s Ratio Prot	c0.02		0.36		0.05	c0.46
v/s Ratio Perm		0.00		0.02		
v/c Ratio	0.25	0.06	0.52	0.03	0.44	0.55
Uniform Delay, d1	37.0	36.5	6.6	4.3	35.3	2.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	0.8	0.0	0.9	0.2
Delay (s)	37.5	36.7	7.4	4.4	36.2	2.4
Level of Service	D	D	A	A	D	A
Approach Delay (s)	37.0		7.3			5.4
Approach LOS	D		A			A

### Intersection Summary
























HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	84.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

# HCM Signalized Intersection Capacity Analysis

## 4: Livermore Avenue & Las Positas Road

Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	124	68	86	566	54	233	109	913	487	381	1242	25
Future Volume (vph)	124	68	86	566	54	233	109	913	487	381	1242	25
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	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.97	1.00	0.88	1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1707		3433	1863	2787	1770	3539	1583	3433	3529	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1707		3433	1863	2787	1770	3539	1583	3433	3529	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	124	68	86	566	54	233	109	913	487	381	1242	25
RTOR Reduction (vph)	0	36	0	0	0	185	0	0	287	0	1	0
Lane Group Flow (vph)	124	118	0	566	54	48	109	913	200	381	1266	0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	8	8		4	4		5	2		1	6	
Permitted Phases						4			2			
Actuated Green, G (s)	13.1	13.1		25.3	25.3	25.3	11.4	50.6	50.6	18.1	57.3	
Effective Green, g (s)	13.1	13.1		25.3	25.3	25.3	11.4	50.6	50.6	18.1	57.3	
Actuated g/C Ratio	0.11	0.11		0.21	0.21	0.21	0.09	0.41	0.41	0.15	0.47	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	188	181		705	382	572	163	1454	650	504	1642	
v/s Ratio Prot	c0.07	0.07		c0.16	0.03		0.06	0.26		c0.11	c0.36	
v/s Ratio Perm						0.02			0.13			
v/c Ratio	0.66	0.65		0.80	0.14	0.08	0.67	0.63	0.31	0.76	0.77	
Uniform Delay, d1	52.9	52.8		46.5	40.0	39.5	54.0	28.8	24.4	50.4	27.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.1	8.2		6.6	0.2	0.1	9.9	2.1	1.2	6.4	3.6	
Delay (s)	61.0	61.0		53.1	40.2	39.6	64.0	30.8	25.7	56.8	31.0	
Level of Service	E	E		D	D	D	E	C	C	E	C	
Approach Delay (s)		61.0			48.6			31.6			37.0	
Approach LOS		E			D			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			38.9				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			123.1				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			79.5%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 5: Livermore Avenue & Portola Avenue








Chick-fil-a Restaurant - Livermore Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	578	701	177	48	466	97	180	788	41	200	1004	617
Future Volume (vph)	578	701	177	48	466	97	180	788	41	200	1004	617
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		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.97		1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3432		1770	3448		1770	3513		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3432		1770	3448		1770	3513		1770	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	578	701	177	48	466	97	180	788	41	200	1004	617
RTOR Reduction (vph)	0	17	0	0	14	0	0	3	0	0	0	43
Lane Group Flow (vph)	578	861	0	48	549	0	180	826	0	200	1004	574
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	7	4		3	8		5	2		1	6	6 7
Permitted Phases												
Actuated Green, G (s)	24.8	42.5		6.1	23.8		16.2	44.5		17.9	46.2	75.0
Effective Green, g (s)	24.8	42.5		6.1	23.8		16.2	44.5		17.9	46.2	75.0
Actuated g/C Ratio	0.20	0.33		0.05	0.19		0.13	0.35		0.14	0.36	0.59
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	670	1148		85	646		225	1230		249	1287	934
v/s Ratio Prot	c0.17	0.25		0.03	c0.16		0.10	0.24		c0.11	c0.28	0.36
v/s Ratio Perm												
v/c Ratio	0.86	0.75		0.56	0.85		0.80	0.67		0.80	0.78	0.61
Uniform Delay, d1	49.5	37.5		59.2	49.9		53.8	35.0		52.8	35.9	16.7
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	11.1	2.8		8.3	10.4		18.1	2.9		16.9	4.7	1.2
Delay (s)	60.6	40.3		67.5	60.3		71.9	38.0		69.7	40.6	17.9
Level of Service	E	D		E	E		E	D		E	D	B
Approach Delay (s)		48.4			60.8			44.0			36.1	
Approach LOS		D			E			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			44.5			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			127.0			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			83.5%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 1: Livermore Avenue & I-580 WB Ramp







Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	401	9	18	773	81	0	0	181	185
Future Volume (vph)	0	0	0	401	9	18	773	81	0	0	181	185
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			4.0	4.0
Lane Util. Factor				0.95	0.95		0.97	1.00			0.95	1.00
Frt				1.00	0.99		1.00	1.00			1.00	0.85
Flt Protected				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1674		3433	1863			3539	1583
Flt Permitted				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1674		3433	1863			3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	401	9	18	773	81	0	0	181	185
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	0	0	0	140
Lane Group Flow (vph)	0	0	0	217	205	0	773	81	0	0	181	45
Turn Type				Perm	NA		Prot	NA			NA	Prot
Protected Phases					8		5	2			6	6
Permitted Phases				8								
Actuated Green, G (s)				11.3	11.3		16.3	33.1			12.8	12.8
Effective Green, g (s)				11.3	11.3		16.3	33.1			12.8	12.8
Actuated g/C Ratio				0.22	0.22		0.31	0.63			0.24	0.24
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				362	360		1067	1176			864	386
v/s Ratio Prot							c0.23	0.04			c0.05	0.03
v/s Ratio Perm				c0.13	0.12							
v/c Ratio				0.60	0.57		0.72	0.07			0.21	0.12
Uniform Delay, d1				18.5	18.4		16.1	3.7			15.8	15.4
Progression Factor				1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2				2.7	2.1		2.5	0.1			0.6	0.6
Delay (s)				21.2	20.4		18.5	3.8			16.3	16.0
Level of Service				C	C		B	A			B	B
Approach Delay (s)		0.0			20.8			17.1			16.2	
Approach LOS		A			C			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			17.9				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			52.4				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			69.2%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 2: Livermore Avenue & I-580 EB Ramp

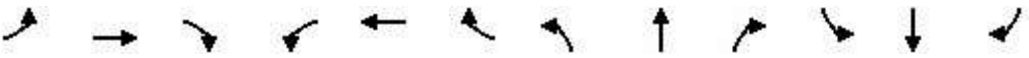










Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	4	964	0	0	0	0	837	302	47	495	0
Future Volume (vph)	39	4	964	0	0	0	0	837	302	47	495	0
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	4.0	
Lane Util. Factor		0.95	*0.75					0.95		1.00	0.95	
Frt		0.86	0.85					0.96		1.00	1.00	
Flt Protected		1.00	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1521	1188					3398		1770	3539	
Flt Permitted		1.00	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1521	1188					3398		1770	3539	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	39	4	964	0	0	0	0	837	302	47	495	0
RTOR Reduction (vph)	0	159	159	0	0	0	0	33	0	0	0	0
Lane Group Flow (vph)	0	347	342	0	0	0	0	1106	0	47	495	0
Turn Type	Prot	NA	Prot					NA		Prot	NA	
Protected Phases	7	4	4					2		1	6	
Permitted Phases												
Actuated Green, G (s)		50.5	50.5					41.5		4.6	50.1	
Effective Green, g (s)		50.5	50.5					41.5		4.6	50.1	
Actuated g/C Ratio		0.47	0.47					0.38		0.04	0.46	
Clearance Time (s)		4.0	4.0					4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		707	552					1298		74	1632	
v/s Ratio Prot			c0.29					c0.33		c0.03	0.14	
v/s Ratio Perm		0.23										
v/c Ratio		0.49	0.62					0.85		0.64	0.30	
Uniform Delay, d1		20.1	21.8					30.7		51.2	18.3	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		0.5	2.1					5.6		16.5	0.1	
Delay (s)		20.7	23.9					36.3		67.6	18.4	
Level of Service		C	C					D		E	B	
Approach Delay (s)		22.3			0.0			36.3			22.7	
Approach LOS		C			A			D			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay		28.3			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.72										
Actuated Cycle Length (s)		108.6			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		69.2%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 3: Livermore Avenue & Arroyo Plaza
























Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	0	27	11	0	70	57	1004	17	91	1307	38
Future Volume (vph)	64	0	27	11	0	70	57	1004	17	91	1307	38
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		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.85		1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1583		3433	1583		1770	3539	1583	3433	3524	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1583		3433	1583		1770	3539	1583	3433	3524	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	64	0	27	11	0	70	57	1004	17	91	1307	38
RTOR Reduction (vph)	0	24	0	0	65	0	0	0	7	0	2	0
Lane Group Flow (vph)	64	3	0	11	5	0	57	1004	10	91	1343	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	3.6	6.9		0.9	4.2		2.9	34.9	34.9	3.1	35.1	
Effective Green, g (s)	3.6	6.9		0.9	4.2		2.9	34.9	34.9	3.1	35.1	
Actuated g/C Ratio	0.06	0.11		0.01	0.07		0.05	0.56	0.56	0.05	0.57	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	103	176		49	107		83	1998	893	172	2001	
v/s Ratio Prot	c0.04	c0.00		0.00	c0.00		c0.03	0.28		0.03	c0.38	
v/s Ratio Perm									0.01			
v/c Ratio	0.62	0.02		0.22	0.04		0.69	0.50	0.01	0.53	0.67	
Uniform Delay, d1	28.4	24.4		30.1	26.9		29.0	8.2	5.9	28.6	9.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	11.1	0.0		2.3	0.2		21.0	0.9	0.0	2.9	0.9	
Delay (s)	39.5	24.5		32.4	27.1		50.0	9.1	5.9	31.6	10.2	
Level of Service	D	C		C	C		D	A	A	C	B	
Approach Delay (s)		35.1			27.8			11.2			11.6	
Approach LOS		D			C			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			12.7			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			61.8			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			61.7%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 4: Livermore Avenue & Las Positas Road

Chick-fil-a Restaurant - Livermore Avenue






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	14	49	271	49	169	130	806	277	220	1004	86
Future Volume (vph)	54	14	49	271	49	169	130	806	277	220	1004	86
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	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.97	1.00	0.88	1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.88		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1645		3433	1863	2787	1770	3539	1583	3433	3497	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1645		3433	1863	2787	1770	3539	1583	3433	3497	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	54	14	49	271	49	169	130	806	277	220	1004	86
RTOR Reduction (vph)	0	46	0	0	0	147	0	0	124	0	5	0
Lane Group Flow (vph)	54	17	0	271	49	22	130	806	153	220	1085	0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	8	8		4	4		5	2		1	6	
Permitted Phases						4			2			
Actuated Green, G (s)	6.5	6.5		13.8	13.8	13.8	13.0	59.6	59.6	11.8	58.4	
Effective Green, g (s)	6.5	6.5		13.8	13.8	13.8	13.0	59.6	59.6	11.8	58.4	
Actuated g/C Ratio	0.06	0.06		0.13	0.13	0.13	0.12	0.55	0.55	0.11	0.54	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	106	99		439	238	357	213	1958	876	376	1896	
v/s Ratio Prot	c0.03	0.01		c0.08	0.03		c0.07	0.23		0.06	c0.31	
v/s Ratio Perm						0.01			0.10			
v/c Ratio	0.51	0.17		0.62	0.21	0.06	0.61	0.41	0.17	0.59	0.57	
Uniform Delay, d1	49.1	48.0		44.5	42.0	41.3	44.9	13.9	11.9	45.6	16.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.8	0.8		2.6	0.4	0.1	5.1	0.6	0.4	2.3	1.3	
Delay (s)	52.9	48.9		47.0	42.5	41.3	50.0	14.6	12.3	47.9	17.6	
Level of Service	D	D		D	D	D	D	B	B	D	B	
Approach Delay (s)		50.7			44.6			17.8			22.7	
Approach LOS		D			D			B			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			25.3									
HCM 2000 Level of Service											C	
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			107.7									
Sum of lost time (s)										16.0		
Intersection Capacity Utilization			62.1%								B	
ICU Level of Service												
Analysis Period (min)			15									
c Critical Lane Group												



# HCM Signalized Intersection Capacity Analysis

## 5: Livermore Avenue & Portola Avenue

Chick-fil-a Restaurant - Livermore Avenue

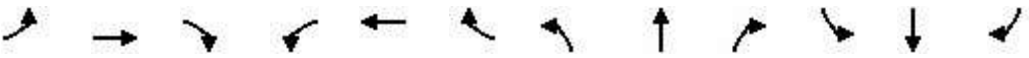






												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	349	329	122	40	890	150	326	624	47	86	839	379
Future Volume (vph)	349	329	122	40	890	150	326	624	47	86	839	379
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.96		1.00	0.98		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3396		1770	3463		1770	3502		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3396		1770	3463		1770	3502		1770	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	349	329	122	40	890	150	326	624	47	86	839	379
RTOR Reduction (vph)	0	33	0	0	12	0	0	5	0	0	0	53
Lane Group Flow (vph)	349	418	0	40	1028	0	326	666	0	86	839	326
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	7	4		3	8		5	2		1	6	6 7
Permitted Phases												
Actuated Green, G (s)	12.0	42.0		3.6	33.6		21.0	42.5		8.3	29.8	45.8
Effective Green, g (s)	12.0	42.0		3.6	33.6		21.0	42.5		8.3	29.8	45.8
Actuated g/C Ratio	0.11	0.37		0.03	0.30		0.19	0.38		0.07	0.27	0.41
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	366	1268		56	1035		330	1324		130	938	645
v/s Ratio Prot	c0.10	0.12		0.02	c0.30		c0.18	0.19		0.05	c0.24	0.21
v/s Ratio Perm												
v/c Ratio	0.95	0.33		0.71	0.99		0.99	0.50		0.66	0.89	0.51
Uniform Delay, d1	49.9	25.1		53.9	39.3		45.6	26.8		50.7	39.8	24.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	34.8	0.2		35.0	26.2		45.8	1.4		11.9	12.8	0.6
Delay (s)	84.8	25.3		88.9	65.5		91.4	28.2		62.6	52.6	25.5
Level of Service	F	C		F	E		F	C		E	D	C
Approach Delay (s)		51.2			66.3			48.9			45.4	
Approach LOS		D			E			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			52.7			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			112.4			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			93.9%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												



# HCM Signalized Intersection Capacity Analysis

## 1: Livermore Avenue & I-580 WB Ramp


















Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	351	6	18	999	465	0	0	175	57
Future Volume (vph)	0	0	0	351	6	18	999	465	0	0	175	57
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			4.0	4.0
Lane Util. Factor				0.95	0.95		0.97	1.00			0.95	1.00
Frt				1.00	0.99		1.00	1.00			1.00	0.85
Flt Protected				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (prot)				1681	1671		3433	1863			3539	1583
Flt Permitted				0.95	0.96		0.95	1.00			1.00	1.00
Satd. Flow (perm)				1681	1671		3433	1863			3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	0	0	351	6	18	999	465	0	0	175	57
RTOR Reduction (vph)	0	0	0	0	7	0	0	0	0	0	0	44
Lane Group Flow (vph)	0	0	0	190	178	0	999	465	0	0	175	13
Turn Type				Perm	NA		Prot	NA			NA	Prot
Protected Phases					8		5	2			6	6
Permitted Phases				8								
Actuated Green, G (s)				10.9	10.9		22.6	40.1			13.5	13.5
Effective Green, g (s)				10.9	10.9		22.6	40.1			13.5	13.5
Actuated g/C Ratio				0.18	0.18		0.38	0.68			0.23	0.23
Clearance Time (s)				4.0	4.0		4.0	4.0			4.0	4.0
Vehicle Extension (s)				3.0	3.0		3.0	3.0			3.0	3.0
Lane Grp Cap (vph)				310	308		1315	1266			809	362
v/s Ratio Prot							c0.29	c0.25			0.05	0.01
v/s Ratio Perm				c0.11	0.11							
v/c Ratio				0.61	0.58		0.76	0.37			0.22	0.04
Uniform Delay, d1				22.1	22.0		15.8	4.0			18.5	17.7
Progression Factor				1.00	1.00		1.00	1.00			1.00	1.00
Incremental Delay, d2				3.6	2.6		2.6	0.8			0.6	0.2
Delay (s)				25.7	24.6		18.4	4.9			19.1	17.9
Level of Service				C	C		B	A			B	B
Approach Delay (s)		0.0			25.1			14.1			18.8	
Approach LOS		A			C			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			16.6				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			59.0				Sum of lost time (s)			12.0		
Intersection Capacity Utilization			94.8%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 2: Livermore Avenue & I-580 EB Ramp























Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	6	1274	0	0	0	0	1186	312	16	454	0
Future Volume (vph)	206	6	1274	0	0	0	0	1186	312	16	454	0
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	4.0	
Lane Util. Factor		0.95	0.95					0.95		1.00	0.95	
Frt		0.89	0.85					0.97		1.00	1.00	
Flt Protected		0.99	1.00					1.00		0.95	1.00	
Satd. Flow (prot)		1557	1504					3429		1770	3539	
Flt Permitted		0.99	1.00					1.00		0.95	1.00	
Satd. Flow (perm)		1557	1504					3429		1770	3539	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	206	6	1274	0	0	0	0	1186	312	16	454	0
RTOR Reduction (vph)	0	146	237	0	0	0	0	37	0	0	0	0
Lane Group Flow (vph)	0	614	489	0	0	0	0	1461	0	16	454	0
Turn Type	Prot	NA	Prot					NA		Prot	NA	
Protected Phases	7	4	4					2		1	6	
Permitted Phases												
Actuated Green, G (s)		20.1	20.1					23.1		1.0	28.1	
Effective Green, g (s)		20.1	20.1					23.1		1.0	28.1	
Actuated g/C Ratio		0.36	0.36					0.41		0.02	0.50	
Clearance Time (s)		4.0	4.0					4.0		4.0	4.0	
Vehicle Extension (s)		3.0	3.0					3.0		3.0	3.0	
Lane Grp Cap (vph)		556	537					1409		31	1769	
v/s Ratio Prot			0.33					c0.43		0.01	c0.13	
v/s Ratio Perm		0.39										
v/c Ratio		1.10	0.91					1.04		0.52	0.26	
Uniform Delay, d1		18.1	17.2					16.6		27.4	8.1	
Progression Factor		1.00	1.00					1.00		1.00	1.00	
Incremental Delay, d2		70.1	19.6					34.2		13.7	0.1	
Delay (s)		88.1	36.8					50.7		41.1	8.1	
Level of Service		F	D					D		D	A	
Approach Delay (s)		63.1			0.0			50.7			9.3	
Approach LOS		E			A			D			A	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			50.4					HCM 2000 Level of Service			D	
HCM 2000 Volume to Capacity ratio			1.06									
Actuated Cycle Length (s)			56.2					Sum of lost time (s)		12.0		
Intersection Capacity Utilization			94.8%					ICU Level of Service		F		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 3: Livermore Avenue & Arroyo Plaza
























Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	0	38	60	0	89	29	1246	46	159	1611	50
Future Volume (vph)	34	0	38	60	0	89	29	1246	46	159	1611	50
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		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.97	1.00		1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.85		1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1583		3433	1583		1770	3539	1583	3433	3523	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1583		3433	1583		1770	3539	1583	3433	3523	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	34	0	38	60	0	89	29	1246	46	159	1611	50
RTOR Reduction (vph)	0	35	0	0	82	0	0	0	19	0	2	0
Lane Group Flow (vph)	34	3	0	60	7	0	29	1246	27	159	1659	0
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	2.2	5.3		2.8	5.9		1.8	45.7	45.7	7.6	51.5	
Effective Green, g (s)	2.2	5.3		2.8	5.9		1.8	45.7	45.7	7.6	51.5	
Actuated g/C Ratio	0.03	0.07		0.04	0.08		0.02	0.59	0.59	0.10	0.67	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	50	108		124	120		41	2089	934	337	2344	
v/s Ratio Prot	c0.02	0.00		0.02	c0.00		0.02	0.35		c0.05	c0.47	
v/s Ratio Perm									0.02			
v/c Ratio	0.68	0.02		0.48	0.06		0.71	0.60	0.03	0.47	0.71	
Uniform Delay, d1	37.3	33.6		36.6	33.2		37.5	10.0	6.6	33.0	8.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	31.8	0.1		3.0	0.2		43.2	1.3	0.1	1.0	1.0	
Delay (s)	69.1	33.7		39.5	33.4		80.7	11.3	6.7	34.0	9.2	
Level of Service	E	C		D	C		F	B	A	C	A	
Approach Delay (s)		50.4			35.9			12.6			11.4	
Approach LOS		D			D			B			B	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			13.8			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			77.4			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			68.8%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 4: Livermore Avenue & Las Positas Road






















Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	124	68	86	566	54	234	109	927	487	382	1256	25
Future Volume (vph)	124	68	86	566	54	234	109	927	487	382	1256	25
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	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		0.97	1.00	0.88	1.00	0.95	1.00	0.97	0.95	
Frt	1.00	0.92		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1707		3433	1863	2787	1770	3539	1583	3433	3529	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1707		3433	1863	2787	1770	3539	1583	3433	3529	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	124	68	86	566	54	234	109	927	487	382	1256	25
RTOR Reduction (vph)	0	35	0	0	0	186	0	0	282	0	1	0
Lane Group Flow (vph)	124	119	0	566	54	48	109	927	205	382	1280	0
Turn Type	Split	NA		Split	NA	Perm	Prot	NA	Perm	Prot	NA	
Protected Phases	8	8		4	4		5	2		1	6	
Permitted Phases						4			2			
Actuated Green, G (s)	12.4	12.4		25.4	25.4	25.4	11.5	52.4	52.4	18.3	59.2	
Effective Green, g (s)	12.4	12.4		25.4	25.4	25.4	11.5	52.4	52.4	18.3	59.2	
Actuated g/C Ratio	0.10	0.10		0.20	0.20	0.20	0.09	0.42	0.42	0.15	0.48	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	176	170		700	380	568	163	1489	666	504	1678	
v/s Ratio Prot	c0.07	0.07		c0.16	0.03		0.06	0.26		c0.11	c0.36	
v/s Ratio Perm						0.02			0.13			
v/c Ratio	0.70	0.70		0.81	0.14	0.08	0.67	0.62	0.31	0.76	0.76	
Uniform Delay, d1	54.3	54.2		47.2	40.6	40.1	54.7	28.3	24.0	51.0	26.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.1	11.9		6.8	0.2	0.1	9.9	2.0	1.2	6.4	3.3	
Delay (s)	66.3	66.1		54.1	40.8	40.2	64.6	30.3	25.2	57.4	30.2	
Level of Service	E	E		D	D	D	E	C	C	E	C	
Approach Delay (s)		66.2			49.4			31.1			36.5	
Approach LOS		E			D			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			39.1				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			124.5				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			79.9%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM Signalized Intersection Capacity Analysis

## 5: Livermore Avenue & Portola Avenue

Chick-fil-a Restaurant - Livermore Avenue

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	583	701	177	48	466	102	180	793	41	205	1009	622
Future Volume (vph)	583	701	177	48	466	102	180	793	41	205	1009	622
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		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95		1.00	0.95	1.00
Frt	1.00	0.97		1.00	0.97		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3432		1770	3444		1770	3513		1770	3539	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3432		1770	3444		1770	3513		1770	3539	1583
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	583	701	177	48	466	102	180	793	41	205	1009	622
RTOR Reduction (vph)	0	17	0	0	15	0	0	3	0	0	0	43
Lane Group Flow (vph)	583	861	0	48	553	0	180	831	0	205	1009	579
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	pt+ov
Protected Phases	7	4		3	8		5	2		1	6	6 7
Permitted Phases												
Actuated Green, G (s)	24.9	44.0		4.7	23.8		16.2	44.3		18.0	46.1	75.0
Effective Green, g (s)	24.9	44.0		4.7	23.8		16.2	44.3		18.0	46.1	75.0
Actuated g/C Ratio	0.20	0.35		0.04	0.19		0.13	0.35		0.14	0.36	0.59
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	673	1189		65	645		225	1225		250	1284	934
v/s Ratio Prot	c0.17	0.25		0.03	c0.16		0.10	0.24		c0.12	c0.29	c0.37
v/s Ratio Perm												
v/c Ratio	0.87	0.72		0.74	0.86		0.80	0.68		0.82	0.79	0.62
Uniform Delay, d1	49.4	36.2		60.5	50.0		53.8	35.3		52.9	36.1	16.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	11.3	2.2		35.1	10.9		18.1	3.0		18.6	4.9	1.2
Delay (s)	60.8	38.4		95.6	60.9		71.9	38.3		71.5	40.9	18.0
Level of Service	E	D		F	E		E	D		E	D	B
Approach Delay (s)		47.3			63.6			44.3			36.6	
Approach LOS		D			E			D			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			44.7			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			127.0			Sum of lost time (s)				16.0		
Intersection Capacity Utilization			84.0%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

## **Appendix D**

### **Other Chick-Fil-A Studies**

Location 5539 Auto Mall Parkway in Fremont  
Day: Weekday - Lunch time Date: 01/26/2016  
Time: 12:00 PM to 1:00 PM

Count: Total vehicles queued in drive through (Queue Observations every 1 min)

Beginning	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
12:00 PM	9	10	12	13	12	12	11	14	13	13	12	12	11	10	10		
12:15 PM	9	9	9	9	9	11	10	10	10	10	10	8	7	6	6		
12:30 PM	4	7	7	5	5	5	7	5	4	2	1	1	3	4	4	max	>8
12:45 PM	5	6	5	5	5	6	6	6	8	8	8	8	6	5	5	14	26
																@ Fremont	14 30

Count: Vehicles queued at and behind ordering board (Queue Observations every 1 min)

Location 5539 Auto Mall Parkway in Fremont  
Day: Weekday - Dinner time Date: 01/26/2016  
Time: 5:30 to 6:30 pm

Count: Total queues in drive through (Queue Length Observations every 1 min)

Beginning	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
5:30 PM	5	3	3	3	2	2	3	3	4	3	3	3	1	0	1		
5:45 PM	1	2	3	3	2	2	3	3	3	3	2	2	2	2	1		
6:00 PM	1	3	3	3	2	1	1	1	1	0	0	0	0	0	0	max	>8
6:15 PM	1	1	1	1	1	0	0	0	1	2	1	4	4	3	3	5	0
																@ Fremont	8 0

Count: Queue from ordering board (Queue Length Observations every 1 min)



Location 5539 Auto Mall Parkway in Fremont  
Day: Saturday - Lunch time Date: 1/30/2015  
Time: 12:00 to 1:00 PM

Count: Total queues in drive through (Queue Length Observations every 1 min)

Beginning	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
12:00 PM	2	0	0	1	2	3	2	6	5	4	5	5	7	7	5		
12:15 PM	4	4	5	5	4	3	2	2	1	1	3	2	3	2	1		
12:30 PM	1	3	2	1	0	1	2	2	5	4	3	3	2	2	1	max	>8
12:45 PM	1	0	1	3	3	2	2	3	2	2	2	2	2	1	2	7	0
																@ Fremont	14 44

Count: Queue from ordering board (Queue Length Observations every 1 min)

## Chick Fil A - 53 Headquarters Drive, San Jose

Survey person	Kevin	Survey person	Kevin	Survey person	Kevin
Weather	Clear	Weather	Clear	Weather	Clear
Date	9/7/2013	Date	9/10/2013	Date	9/10/2013
Day of Week	Saturday	Day of Week	Tuesday	Day of Week	Tuesday

Time	Total Drive through Queued Vehicles	Time	Total Drive through Queued Vehicles	Time	Total Drive through Queued Vehicles	Over Flow
12:00 PM	11	5:30 PM	3	12:00 PM	8	
12:01 PM	11	5:31 PM	3	12:01 PM	9	
12:02 PM	11	5:32 PM	2	12:02 PM	8	
12:03 PM	10	5:33 PM	4	12:03 PM	6	
12:04 PM	11	5:34 PM	3	12:04 PM	4	
12:05 PM	10	5:35 PM	4	12:05 PM	3	
12:06 PM	11	5:36 PM	3	12:06 PM	5	
12:07 PM	10	5:37 PM	3	12:07 PM	5	
12:08 PM	9	5:38 PM	4	12:08 PM	7	
12:09 PM	11	5:39 PM	3	12:09 PM	7	
12:10 PM	12	5:40 PM	3	12:10 PM	8	
12:11 PM	12	5:41 PM	3	12:11 PM	8	
12:12 PM	13	5:42 PM	5	12:12 PM	7	
12:13 PM	12	5:43 PM	4	12:13 PM	8	
12:14 PM	11	5:44 PM	5	12:14 PM	8	
12:15 PM	14	5:45 PM	5	12:15 PM	10	1
12:16 PM	13	5:46 PM	4	12:16 PM	10	1
12:17 PM	14	5:47 PM	4	12:17 PM	10	1
12:18 PM	13	5:48 PM	3	12:18 PM	9	1
12:19 PM	11	5:49 PM	2	12:19 PM	9	3
12:20 PM	12	5:50 PM	2	12:20 PM	12	4
12:21 PM	11	5:51 PM	3	12:21 PM	13	4
12:22 PM	12	5:52 PM	3	12:22 PM	13	2
12:23 PM	10	5:53 PM	3	12:23 PM	11	5
12:24 PM	10	5:54 PM	2	12:24 PM	14	3
12:25 PM	10	5:55 PM	1	12:25 PM	12	3
12:26 PM	9	5:56 PM	2	12:26 PM	13	4
12:27 PM	10	5:57 PM	2	12:27 PM	14	3
12:28 PM	11	5:58 PM	2	12:28 PM	11	4
12:29 PM	9	5:59 PM	2	12:29 PM	12	3
12:30 PM	8	6:00 PM	5	12:30 PM	12	2
12:31 PM	7	6:01 PM	7	12:31 PM	11	4
12:32 PM	8	6:02 PM	8	12:32 PM	12	3
12:33 PM	10	6:03 PM	7	12:33 PM	9	4
12:34 PM	12	6:04 PM	6	12:34 PM	9	3
12:35 PM	12	6:05 PM	7	12:35 PM	11	3
12:36 PM	11	6:06 PM	6	12:36 PM	12	3
12:37 PM	11	6:07 PM	5	12:37 PM	11	3
12:38 PM	10	6:08 PM	5	12:38 PM	11	2
12:39 PM	8	6:09 PM	6	12:39 PM	11	1
12:40 PM	8	6:10 PM	6	12:40 PM	12	2
12:41 PM	7	6:11 PM	6	12:41 PM	12	
12:42 PM	8	6:12 PM	4	12:42 PM	10	
12:43 PM	7	6:13 PM	4	12:43 PM	8	
12:44 PM	7	6:14 PM	3	12:44 PM	8	
12:45 PM	8	6:15 PM	3	12:45 PM	8	
12:46 PM	7	6:16 PM	3	12:46 PM	7	
12:47 PM	6	6:17 PM	2	12:47 PM	5	
12:48 PM	7	6:18 PM	3	12:48 PM	7	
12:49 PM	8	6:19 PM	4	12:49 PM	5	
12:50 PM	10	6:20 PM	4	12:50 PM	5	
12:51 PM	11	6:21 PM	3	12:51 PM	5	
12:52 PM	10	6:22 PM	2	12:52 PM	8	
12:53 PM	9	6:23 PM	2	12:53 PM	5	
12:54 PM	9	6:24 PM	3	12:54 PM	9	
12:55 PM	8	6:25 PM	2	12:55 PM	5	
12:56 PM	8	6:26 PM	1	12:56 PM	5	
12:57 PM	8	6:27 PM	2	12:57 PM	6	
12:58 PM	12	6:28 PM	2	12:58 PM	4	
12:59 PM	14	6:29 PM	3	12:59 PM	4	
1:00 PM	14	6:30 PM	2	1:00 PM	3	

Blocked Aisle

# AM Peak-Hour Volume Count Worksheet

Date: 8/31/2016  
Counter: Patti Iwanciov  
Intersection Name: Chick-fil-A - 2280 Monterey Highway  
Weather: Clear San Jose

**AUTO-CENSUS**  
*Traffic Monitoring and Analysis*  
870 Castlewood Dr. #1  
Los Gatos, CA 95032  
Phone 408-826-9673 Fax 408-877-1625

Start Time	Drive-Thru IN		Employee/Customer	
	IN	N/A	IN	OUT
7:00	0	0	0	0
7:15	3	3	4	4
7:30	6	6	6	10
7:45	10	10	9	12
8:00	16	16	15	14
8:15	24	24	21	17
8:30	31	31	23	19
8:45	36	36	25	25
9:00	44	44	29	26


Peak Hour	IN	N/A	IN	OUT
7:00 - 8:00	16	16	15	14
7:15 - 8:15	21	21	17	13
7:30 - 8:30	25	25	17	9
7:45 - 8:45	26	26	16	13
8:00 - 9:00	28	28	14	12


Hourly  
Totals

61  
72  
76  
81  
82  
82

AM Peak Hour		
In	Out	Total
42	40	82

Peak Volumes:

28      28      14      12

82

# PM Peak-Hour Volume Count Worksheet

Date: 8/31/2016  
Counter: Patti Iwanciw  
Intersection Name: Chick-fil-A - 2280 Monterey Highway  
Weather: Clear San Jose

## AUTO-CENSUS

**Traffic Monitoring and Analysis**  
870 Castlewood Dr. #1  
Los Gatos, CA 95032  
Phone 408-826-9673 Fax 408-877-1625

Start Time	Drive-Thru IN		Employee/Customer	
	IN	OUT	IN	OUT
4:00	0	0	0	0
4:15	3	3	3	5
4:30	10	10	11	14
4:45	16	16	16	19
5:00	30	30	20	23
5:15	42	42	25	30
5:30	50	50	32	38
5:45	61	61	41	42
6:00	75	75	53	45


Peak Hour	IN	OUT	IN	OUT
4:00 - 5:00	30	30	20	23
4:15 - 5:15	39	39	22	25
4:30 - 5:30	40	40	21	24
4:45 - 5:45	45	45	25	23
5:00 - 6:00	45	45	33	22
<b>Peak Volumes:</b>	<b>45</b>	<b>45</b>	<b>33</b>	<b>22</b>

0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Hourly  
Totals

103
125
125
138
145

PM Peak Hour		
In	Out	Total
78	67	145