Draft Report

North Bayshore Area Trip Monitoring

Prepared for

City of Mountain View

Prepared by

AECOM

May 31, 2017

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Executive Summary

This report summarizes the results of the trip monitoring study for the North Bayshore area in Mountain View, California. This study is an implementation item of the North Bayshore Precise Plan, adopted in 2014.

The study has the following objectives:

1) Determine the traffic volumes entering the North Bayshore area and monitor gateway capacity;

2) Estimate vehicle-trip and person-trip mode share; and

3) Project future trips.

The following map graphic provides some context to the study area, including the gateway locations, identified development projects, and planned public improvements.

Figure 1 - North Bayshore Area with study boundaries and identified real estate development projects

The data collected for the Spring 2017 period showed decreases in the total number of vehicles entering the North Bayshore area, both in the peak period (7:00 – 10:00 am) and in the peak hour (9:00 – 10:00 am). Declines were not equal across all time periods as the 7:00 – 9:00 am period saw a greater decline while the 9:00 – 10:00 am peak hour was largely flat. Since the last data collection in September of 2016, LinkedIn has left its office space in

North Bayshore which may be contributing to a lower overall headcount of employees based in the study area[1]. However, as that space is set to be re-purposed by Google, this decline may only be temporary as travel patterns are reestablished. Additionally, Google has been shifting some of their employees out of North Bayshore. This is being done to ensure that the number of employees in North Bayshore do not increase until the Northbound US 101 off-ramp and Plymouth/Space Park projects are implemented.

Gateway Traffic Volumes

The following graph compares recent trip counts with previous trip monitoring periods across all gateways in both the peak period (7:00 a.m. - 10:00 a.m.) and peak hour (9:00 a.m. to 10:00 a.m.).

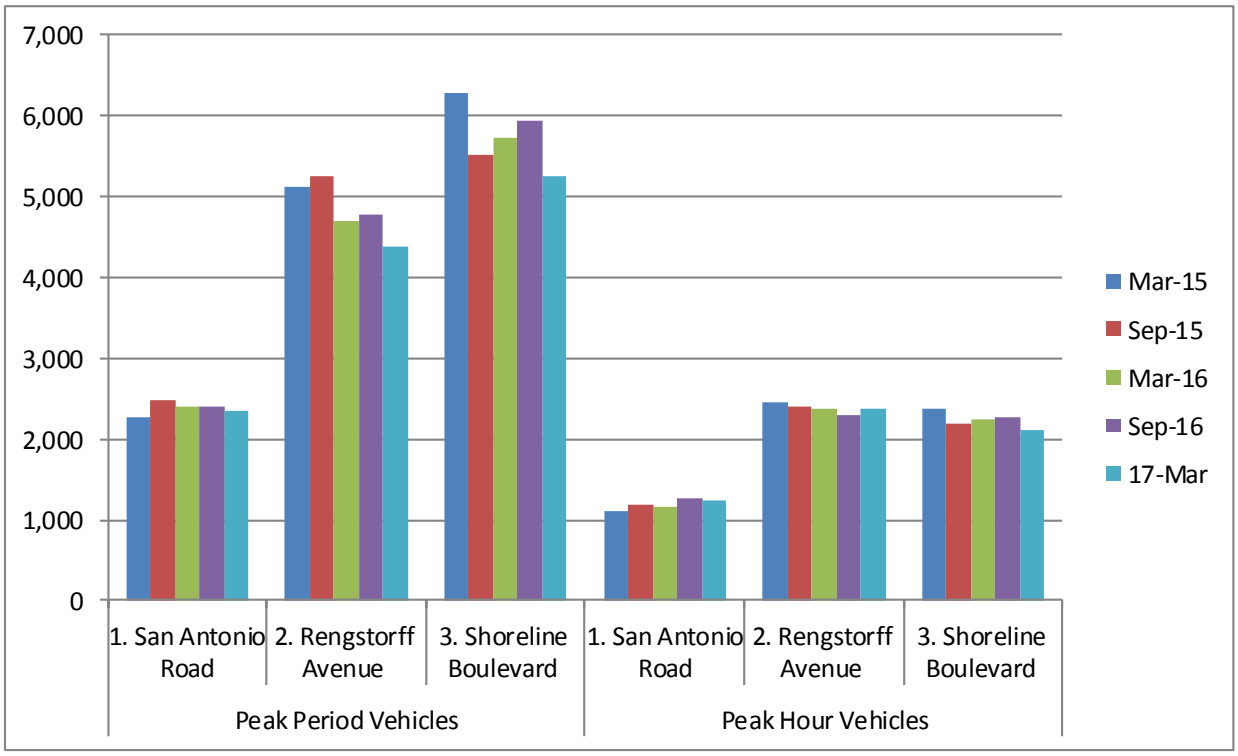

Figure 2 - Gateway Traffic Count Comparison

Gateway Capacity

The following table summarizes the inbound weekday peak period traffic gateway capacity volumes for each North Bayshore gateway between 2016 and 2017.

Key Observations:

- A total of 11,980 motor vehicles entered the North Bayshore area during the morning peak period and total of 5,710 motor vehicles entered the study area during the AM peak hour. The district-wide vehicle trip capacity as set out by the *NBPP* is 18,900 inbound vehicles during the morning peak period. The March 2017 data show that the available motor vehicle capacity is approximately 6,920 vehicles during the AM peak period at the three gateways.

[1] http://www.bizjournals.com/sanjose/news/2016/07/12/google-linkedin-strike-stunning-grand-bargain-for.html

- Shoreline Boulevard is still the most congested gateway. The 2016 data showed available capacity of approximately 800 vehicles in the AM peak period. This capacity has increased approximately 1,500 vehicles, likely due to the LinkedIn vacancies and Google employee shifting noted earlier.
- Of the three gateways, Rengstorff Avenue now has the highest available capacity at 45%. Together, San Antonio Road and Rengstorff Avenue represent about 89% of the available capacity among the three gateways.

Table E1: Inbound Gateway Available Capacity: AM Peak Period and Peak Hour

Gateway / Roadway Segment			1. San Antonio Road	2. Rengstorff Avenue	3. Shoreline Boulevard	Total
			San Antonio Road (total)	US 101 NB Ramps and Garcia Avenue-Charleston Road	US 101 NB Ramps-La Avenida Street and Pear Avenue	
Peak Period	Gateway Capacity		4,140	8,020	6,740	**18,900**
	Previous Sept '16	Vehicle Volume	2,390	4,790	5,930	**13,110**
		Available Capacity	1,760	3,230	810	**5,790**
	New Data March '17	Vehicle Volume	2,350	4,380	5,250	**11,980**
		Available Capacity	1,790	3,640	1,490	**6,920**
	Vehicle Capacity Change from Fall to Spring		-40	-410	-680	**-1,130**
			-1.70%	-8.60%	-11.50%	**-8.60%**
Peak Hour	Gateway Capacity		1,530	2,960	2,490	**6,980**
	Previous Sept '16	Vehicle Volume	1,260	2,290	2,270	**5,820**
		Available Capacity	270	670	220	**1,160**
	New Data March '17	Vehicle Volume	1,240	2,370	2,100	**5,710**
		Available Capacity	290	590	390	**1,270**
	Vehicle Capacity Change from Fall to Spring		-20	+80	-170	**-110**
			-1.60%	+3.50%	-7.50%	**-1.90%**

Source: AECOM, 2017.

Net Traffic Flows

While Peak Period and Peak Hour counts show flat to declining traffic volumes, the 24 hour based traffic counts are showing a high level of traffic volume outside of the Peak Period, in the 10:00 – 11:00 am hour. This traffic volume is such that the number of vehicles entering North Bayshore in the 10:00 – 11:00 am hour (4,807 vehicles) is similar to the number of vehicles entering in the 8:00 – 9:00 AM hour (4,934) and far greater than the number entering in the 7:00 – 8:00 am hour (2,586).

Table E2: Net Inbound / Outbound Gateway Traffic Flows

Time Period	Hourly Traffic Flows		
	Inbound	Outbound	Net Change
00:00 – 01:00	105	206	-101
01:00 – 02:00	62	81	-20
02:00 – 03:00	53	56	-3
03:00 – 04:00	72	54	19
04:00 – 05:00	266	166	100
05:00 – 06:00	790	213	577
06:00 – 07:00	1474	395	1079
07:00 – 08:00	2586	641	1946
08:00 – 09:00	4934	904	4030
09:00 – 10:00	5826	1015	4811
10:00 – 11:00	4807	1198	3609
11:00 – 12:00	2796	1393	1403
12:00 – 13:00	2263	1787	476
13:00 – 14:00	1964	1985	-21
14:00 – 15:00	1519	2200	-681
15:00 – 16:00	1378	2454	-1076
16:00 – 17:00	1580	3611	-2031
17:00 – 18:00	1580	4475	-2896
18:00 – 19:00	1659	3750	-2091
19:00 – 20:00	1328	3104	-1776
20:00 – 21:00	794	1745	-952
21:00 – 22:00	450	994	-545
22:00 – 23:00	355	658	-303
23:00 – 24:00	183	322	-139

Source: AECOM, 2017.

Key Observations:

- Whereas the morning peak period is quite distinct, the afternoon peak period is more dispersed through the evening hours.
- Continued monitoring of the outbound trips and the pm period will help identify trends in traffic flows both in terms of time as a well as quantity and direction of travel.
- It appears the heavy traffic loads experienced during the Peak Period are spreading into the middle of the day, in a manner consistent with anecdotal evidence. As such, while traffic volumes in the Peak Period may show declines, the overall travel and trip demand to the North Bayshore Area may just be spreading beyond the traditional peak commute times.
- In March 2017, an average of 2,560 vehicles exited the North Bayshore area during the AM peak period of 7:00 AM to 10:00 AM. In addition, the net gain of vehicles was an average of 12,438 remaining on site beyond the 10:00 AM cutoff of the peak hour. This is an indication of parking demand.
- Tracking the change in outbound vehicles and net difference in inbound-outbound traffic during the peak period may in future offer insight to use of ridesharing services and the demand for onsite parking. As new technology and commuting patterns continue to evolve, traditional measures like 'carpool' and 'high

occupancy vehicle' may become less relevant as they may not combine trips or 'single occupancy vehicles' as in the past.

Mode Share

The person-trip averages and mode shares are summarized in **Table E3**. It should be noted that the AM peak hour person-trips reported in **Table E3** are for the motor vehicle peak hour, occurring between 9:00 AM and 10:00 AM. The analysis of data collected during the March 2017 trip monitoring effort shows little change in the inbound motor vehicle trips and person-trip mode shares for single-occupancy vehicles (SOVs) as compared to the data collected in September 2016.

An area-wide single-occupancy (drive-alone) mode share target established by the *North Bayshore Precise Plan* is 45 percent. The current trip monitoring effort shows that the target is not met. The weekday AM peak period and the weekday AM peak hour single-occupancy vehicle mode share are 47.2 percent and 53.3 percent, respectively. In September 2016, the reported SOV mode shares during the weekday AM peak period and the weekday AM peak hour were both 45.2 percent and 50.1 percent, respectively. Therefore from September 2016 to March 2017, there is an increase of over two percent in the SOV mode share during the AM peak period and an increase of approximately three percent in the SOV mode split during the AM peak hour.

Key Observations:

- The analysis of the new data collected in Spring 2017, compared with the previous data from Fall 2016, shows a slight increase (1.9%) in the percentage of single occupancy vehicles within the overall decrease of vehicles entering the North Bayshore area during the Peak Period. However, there appears to be a seasonal effect taking place where a slightly higher percentage of single occupancy cars are observed in the Spring then the Fall.
- This data collection round is consistent with that trend. While this resulted in an overall higher percentage of single occupancy vehicles entering North Bayshore; in real terms the number of single occupancy vehicles fell along with the overall traffic count numbers.
- The single occupancy mode share was measured at (47.2% in the Peak Period and 53.3% in the Peak Hour), which is above the Precise Plan's 45% SOV target.

Table E3: Inbound Person-Trips by Mode

Classification	Weekday AM Peak Period[1]			Weekday AM Peak Hour[1][3]		
	Previous	New Data	Difference	Previous	New Data	Difference
	Sep-2016	Mar-2017		Sep-2016	Mar-2017	
Drive Alone (SOV)	45.2%	47.2%	+1.9%	*50.1%*	*53.3%*	+3.2%
Carpool (HOV)	12.3%	11.6%	-0.7%	*13.2%*	*13.5%*	+0.4%
Transit / Shuttle	34.8%	34.4%	-0.4%	*29.3%*	*25.0%*	-4.3%
Other[2]	1.0%	0.8%	-0.1%	*0.9%*	*1.0%*	+0.1%
Bicycle	5.5%	4.8%	-0.7%	*5.5%*	*5.9%*	+0.4%
Pedestrian	1.1%	1.1%	0.0%	*1.0%*	*1.2%*	+0.2%

Source: AECOM, 2017.
Notes:
[1] Classification percentages were rounded to the nearest tenth of a number.
[2] The "Other" category includes motorcycles, trucks, and intercampus Google shuttles at one person-trip per vehicle.
[3] Weekday AM peak hour consists of four consecutive 15-minute intervals with the highest recorded motor vehicle volumes (9:00-10:00 AM).

Future Development

The following table summarizes key recent developments and their estimated number of AM peak period trips.

Table E4: AM Peak Period Trips for Key Recent Developments

Development	Estimated Trips
Charleston East	918
Microsoft	308
Sobrato	400
Broadreach	338
Shashi	189
Intuit	84
Total	2,237

The Precise Plan Strategy is that more diverse, more compact, and denser development will ease the challenge in accommodating workers and reduce the need for long distance commuting. Further study will be needed to evaluate decreasing the impacts on single occupancy vehicle travel and vehicle miles travelled (VMT) as a result of new development in North Bayshore, particularly as it relates to residential development.

Rengstorff Avenue and San Antonio Road gateways should still be under capacity if the expected new trips from these key developments are added to the roadway network. The following table shows how new development will impact the Shoreline Boulevard gateway:

Table E5: New Development Impacts on the Shoreline Boulevard Gateway

Existing volume	5,250
Key development trips	2,237
Total	**7,487**
Gateway capacity	6,740
Trips exceeding gateway capacity	**747**

Based on these figures, the Shoreline Boulevard gateway would likely exceed its capacity sometime in the next several years as new developments reach occupancy and more vehicle trips are added to Shoreline Boulevard. However, the following improvement projects are planned to increase capacity at the Shoreline Boulevard gateway. These projects would increase vehicle capacity on Shoreline Boulevard by an estimated 1,650 vehicle trips, which would cover more than the 747 vehicle trip deficit noted in Table E5.

Key Improvement Projects:

- **101 Shoreline Off Ramp**

  This project, currently under design as a City capital improvement project, would allow drivers exiting the northbound Highway 101 off-ramp with destinations east of Shoreline Boulevard to avoid Shoreline Boulevard altogether. One intersection on Shoreline Boulevard is also eliminated, reducing delay for through traffic. This project is anticipated to be completed by 2021.

- **Inigo Way Extension**

  The extension of Indigo Way, proposed as part of the Sobrato development at 1255 Pear Avenue, will provide a key north-south connection for vehicles using the new Highway 101 off-ramp. This project's completion date is still being determined, but could be within the 2020-2021 timeframe.

- **Space Park Realignment**

  This project eliminates one intersection on Shoreline Boulevard and allows additional space for queuing of vehicles turning left to Plymouth Avenue. East-West traffic is also able to cross Shoreline Boulevard without traversing Shoreline Boulevard. This project's expected completion date is between 2021 and 2022.

- **Reversible Bus Lane**

  Currently in design phase, the addition of a reversible bus lane to speed to bus movements could increase Shoreline Boulevard capacity by 100 vehicles over the course of the peak hour. The completion date for this project is expected to be in 2019.

Conclusions

The analysis of data collected during the March 2017 trip monitoring effort shows slight declines in overall traffic volumes and little change in mode shares for the inbound motor vehicle trips and person-trip for SOVs as compared to the data collected in September 2016.

While person trip mode share is approaching the 45% goal, that level remains unattained. The district-wide vehicle trip capacity identified by the *NBPP* is 18,900 inbound vehicles during the morning peak period. The March 2017 data show that there is available capacity for approximately 6,920 additional vehicles during the AM peak period at the three gateways, although Shoreline Boulevard has the least amount of available vehicle capacity.

The proposed improvements projects in North Bayshore, such as the new northbound US 101 off-ramp, will be implemented in the near future to help increase vehicle capacity along the Shoreline corridor.

Disclaimers

Some variation natural fluctuation in the data is expected dues to seasonality, weather, and corporate head counts change as a broader base line is established.

Study Detail

This report summarizes the results of the trip monitoring study undertaken in the North Bayshore area of Mountain View, California. The study had two major objectives 1) determine the traffic volumes entering the North Bayshore area and 2) estimate person-trip mode share.

In this study, the concept of person-trips is used to estimate the single occupancy vehicle (SOV) mode split. The SOV mode split is the percentage of people who drive into the study area alone (as lone occupants of their motor vehicles), as compared to people who walk, bike, carpool, travel by bus, etc.

In the context of this report, a person-trip is a one-direction inbound movement into the study area by an individual person. Several person-trips may be associated with a single vehicle trip if the vehicle transports more than one person. For example, one carpool vehicle entering the study area with a driver and a passenger would result in two person-trips while representing only one vehicle trip.

Natural geographic features and the US 101 alignment limit motor vehicle access to the North Bayshore area to the following gateways:

1. San Antonio Road
    a. San Antonio Road, between Bayshore Parkway and Casey Avenue
    b. Bayshore Parkway, between San Antonio Road and Garcia Avenue
2. Rengstorff Avenue
3. Shoreline Boulevard

In addition to the above gateways, pedestrians and bicyclists can also access the area using Permanente Creek and Stevens Creek trails.

The three-hour AM peak period (7:00 AM to 10:00 AM) inbound traffic volumes were calculated for the overall area and for each gateway individually. In addition to the peak period analysis results, peak hour volumes were also determined. For the three-hour AM peak period, the person-trip mode split for the entire North Bayshore area was calculated using vehicle classifications obtained during the data collection and estimated transit / shuttle vehicle occupancies.

The results were then compared to the vehicle trip cap and person-trip mode share targets established by the *North Bayshore Precise Plan* (December 2014) [2] (hereafter referred to as the "*NBPP*") for the weekday morning peak period (7:00 AM to 10:00 AM).

Background

The *NBPP* was developed by the City of Mountain View to implement the goals and policies of the *Mountain View 2030 General Plan* (July, 2012), for the North Bayshore area. Specifically, one of the Land Use and Development goals (LUD 17.2 Transportation Demand Management Strategies), requires developments in the North Bayshore area to include and implement Transportation Demand Management (TDM) strategies [3] to promote efficient use of existing transportation facilities. The *NBPP* subsequently established a vehicle trip and development monitoring program in an effort to implement the vision and objectives of the plan.

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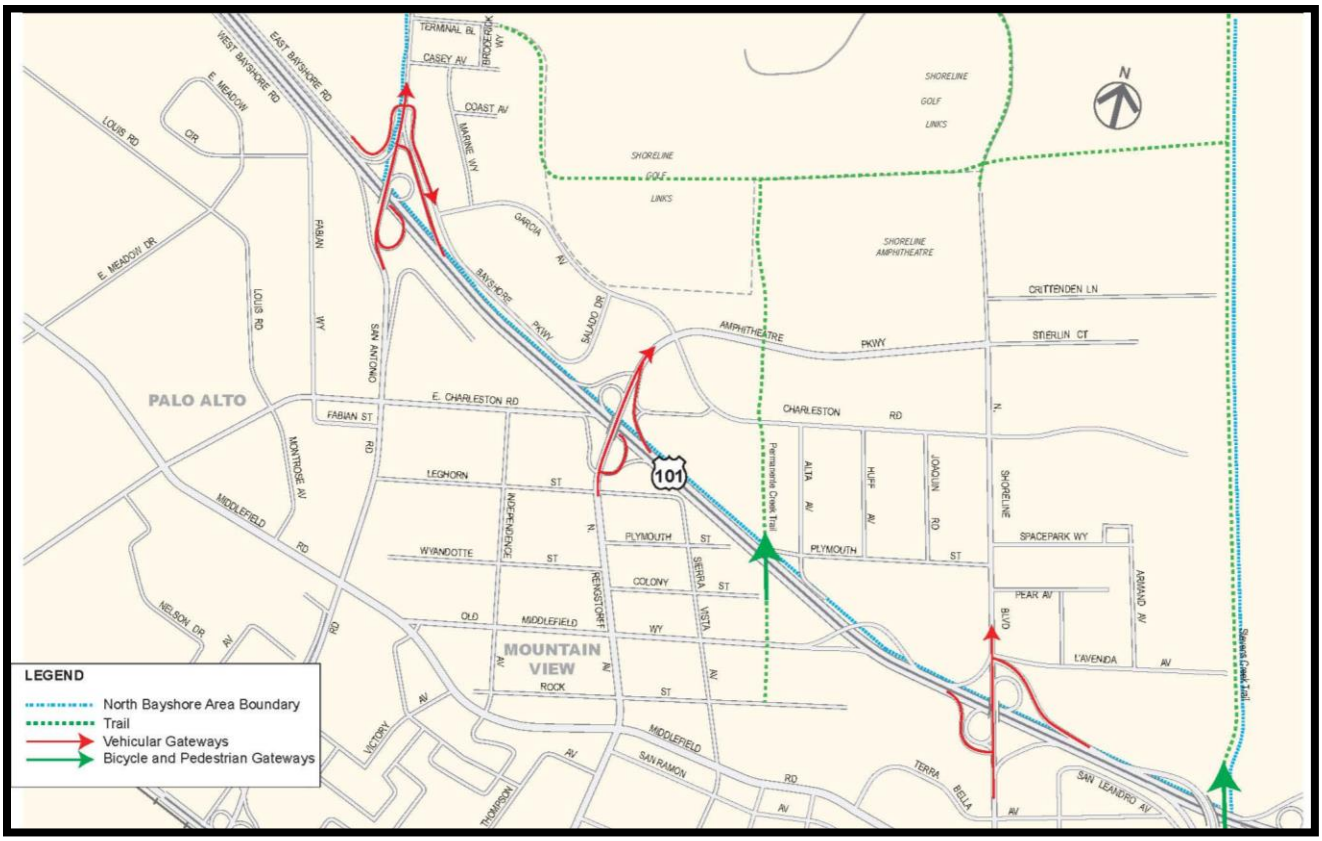
[2] City of Mountain View North *Bayshore Precise Plan* (December 2014).
Online: http://www.mountainview.gov/civicax/filebank/blobdload.aspx?BlobID=15038

[3] City of Mountain View Community Development Department *Mountain View 2030 General Plan* (July, 2012).
Online: http://www.mountainview.gov/civicax/filebank/blobdload.aspx?blobid=10702

Figure 3: North Bayshore Area



The *NBPP's* Transportation Demand Management program aims to reduce daily and peak hour vehicle trips below the capacity of the aforementioned gateways. The *NBPP* established a vehicle trip cap during the morning peak period (7:00 AM to 10:00 AM) for vehicles accessing the *NBPP* area, in compliance with the City of Mountain View trip reduction targets. A district-wide vehicle trip cap is initially set at 18,900 inbound vehicles while an area-wide single-occupancy (drive-alone) mode share target is 45 percent.

The transportation elements of the *NBPP* were analyzed as part of the *Final Transportation Impact Analysis, North Bayshore Precise Plan in Mountain View, California* (*NBPP TIA*)[4] prepared in October 2014. The initial vehicle trip cap was developed by analyzing traffic flow into and out of the North Bayshore Area via three main gateways described above. The vehicle trip cap is based on the existing vehicle throughput capacity of the main gateways. As described in the *NBPP TIA*, "For the purposes of this analysis, 'vehicle gateway capacity' is defined as the maximum number of vehicles that can be served in a specified time period while maintaining reasonable freedom of vehicle movement through the gateways. Rather than apply a theoretical per-lane capacity assumption, the vehicle capacity for each gateway was calculated based on observed vehicle demand, queuing characteristics, and available vehicle storage that could be accommodated without blocking other movements and causing gridlock." The individual vehicle gateway capacities were estimated for the peak hour first, and then, the peak period capacity was established based on the ratio between the existing peak period and peak hour vehicle counts.

The *NBPP* also evaluated bicycle and pedestrian counts taken at the two bicycle/pedestrian trail segments that provide access to the North Bayshore Area.

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[4] Fehr and Peers *Final Transportation Impact Analysis, North Bayshore Precise Plan in Mountain View, California* (October 2014). Online: http://www.mountainview.gov/civicax/filebank/blobdload.aspx?BlobID=14513

The vehicle trip caps and occupancy targets developed as part of the *NBPP* were based on an analysis of the existing travel characteristics for the entry/exit points of the North Bayshore Area as summarized in the *North Bayshore Precise Plan EIR – Establishing Existing Travel Characteristics for North Bayshore* (March 12, 2014) memorandum, (hereafter referred to as the "*NBPP memo*" and included in **Appendix A**). The *NBPP Memo* serves as the first data point for the ongoing monitoring of TDM effectiveness and trip-making behavior in the North Bayshore area.

The *NBPP Memo* analyzed transportation data collected in February 2014 at the three vehicle gateways to the North Bayshore area. The analysis determined the peak period and peak hour vehicle trips, as well as the person-trip mode split during the peak period and peak hour.

As summarized in the *NBPP Memo*, the North Bayshore area generates 13,940 inbound trips during the AM peak period (7:00 AM to 10:00 AM). Shoreline Boulevard was identified as the most heavily-used access route and carried 47 percent of all inbound North Bayshore area traffic during the AM peak period. In the AM peak hour, Shoreline Boulevard served 41 percent of all vehicles entering the area.

The *NBPP Memo* also determined the person-trip mode share for the morning peak period and peak hour. The percentages of people who drove alone were 57 percent and 50 percent for the morning peak period and peak hour, respectively. The percentage of people who used transit and shuttle options to enter the study area during the AM peak period was 25 percent while 33 percent of people used the transit and shuttles during the AM peak hour.

The Trip Monitoring program established by the *NBPP* requires semiannual assessments of transportation characteristics of the North Bayshore area. The *NBPP* includes the following standards for Trip Monitoring for the NBPP area:

> The City shall monitor the number of vehicle trips during the morning peak period (7:00 AM to 10:00 AM) at each of the three major entry points to North Bayshore.
>
> If monitoring shows the established trip cap is reached at any of the three gateway locations after two consecutive data reporting periods, the City of Mountain View, will not grant any new building permits for new square footage within the *NBPP* area until the morning peak period vehicle trips is reduced below the trip cap.
>
> - The City shall prepare an annual North Bayshore vehicle trip cap report.
> - The City Council shall review the annual vehicle trip cap report and may adjust the trip cap to reflect any new capacity at the gateways. Failure to achieve the vehicle trip cap to the satisfaction of the City of Mountain View may result in the City Council considering (but is not limited to) any of the following:
>   - Require new developments to implement additional project and/or area-wide TDM strategies;
>   - Increase the amount of City or developer contributions to fund area transportation improvements; and,
>   - Implement a congestion pricing program for the area. [5]

[5] City of Mountain View North *Bayshore Precise Plan* (December 2014). Online: http://www.mountainview.gov/civicax/filebank/blobdload.aspx?BlobID=15038

Last year's vehicle trip cap report served as the first iteration of the ongoing trip monitoring process and established the methodology and work plan for conducting and analyzing traffic volume counts, vehicle classification counts, and vehicle occupancy counts.

North Bayshore Area Existing Conditions

Land Use

The North Bayshore Area is primarily comprised of various land uses including but not limited to office, research and development, commercial, residential, entertainment and open space land uses. The area includes a number of technology firms that generate a high level of work-based trips within the area. These technology firms represent major employment centers within the City of Mountain View, and include but are not limited to the following companies:

- Google Incorporated ("Google");
- Intuit; and,
- Microsoft Corporation ("Microsoft").

The area's residential land use is limited and is primarily comprised of the Santiago Villa Mobile Home Park located in the eastern portion of the area (bounded by Space Park Way in the north, Villa in the south, Stevens Creek trail in the east and a fenced partition approximately 300 feet west of Armand Avenue), and several single-family residences. Approximately 50 percent of the area is comprised of parks and open space primarily concentrated in the northern portion of the area, including Shoreline at Mountain View regional park.

The largest entertainment land use is comprised of the Shoreline Amphitheater, an outdoor venue with 22,000 seats (a portion of which are comprised of lawn seating). The venue hosts festivals, concerts, and comedy shows, which generally attract a large number of person trips.

Roadway Network

The North Bayshore Area is served by an extensive regional and local roadway network described below.

US Highway 101 is a ten-lane (three mixed-flow lanes and two High Occupancy Vehicle [HOV] lanes in each direction in the project vicinity) freeway that runs east-west in the study area and serves as the southern boundary of the North Bayshore Area. The roadway provides access between the San Francisco (and points further north), and the southern San Francisco Bay area (and points south). Access to the North Bayshore Area is provided via on- and off-ramps at San Antonio Road, Rengstorff Avenue and North Shoreline Boulevard.

State Route 85 (SR 85) is a six-lane (two mixed-flow lanes and one HOV lane in each direction) freeway that extends northwest from the US 101 interchange in the City of San Jose to the US 101 interchange in Mountain View. Access to the North Bayshore Area is provided via the SR 85 interchange with US 101 located at the southeast boundary of the North Bayshore Area.

State Route 237 (SR 237) is a six-lane (two mixed-flow lanes and one HOV lane in each direction) freeway that runs east-west between the City of Mountain View and the City of Milpitas. Access to the North Bayshore Area is provided via an interchange with US 101 located approximately two miles south east of the North Bayshore Area.

Shoreline Boulevard is a four-lane (two lanes in each direction) north-south arterial roadway with a raised median that separates the two directions of travel. Shoreline Boulevard extends from El Camino Real in the south to the Shoreline at Mountain View park in the north. Within the North Bayshore Area Shoreline Boulevard also features a Class 2 bicycle facility (dedicated road space in the paved right-of-way) in both directions.

Rengstorff Avenue is a four-lane (two lanes in each direction) arterial roadway that extends from El Camino Real in the south to its intersection with Garcia Avenue / Charleston Road within the North Bayshore Area. Rengstorff Avenue features a Class 2 bicycle facility in both directions.

San Antonio Road is a two-lane (one lane in each direction within the North Bayshore Area) arterial roadway that extends north from Foothill Expressway to Shoreline at Mountain View park.

Bayshore Parkway is a two-lane (one lane in each direction) street that runs east-west parallel to US 101 within the North Bayshore Area. The street extends from San Antonio Road to Saldo Drive within the North Bayshore Area.

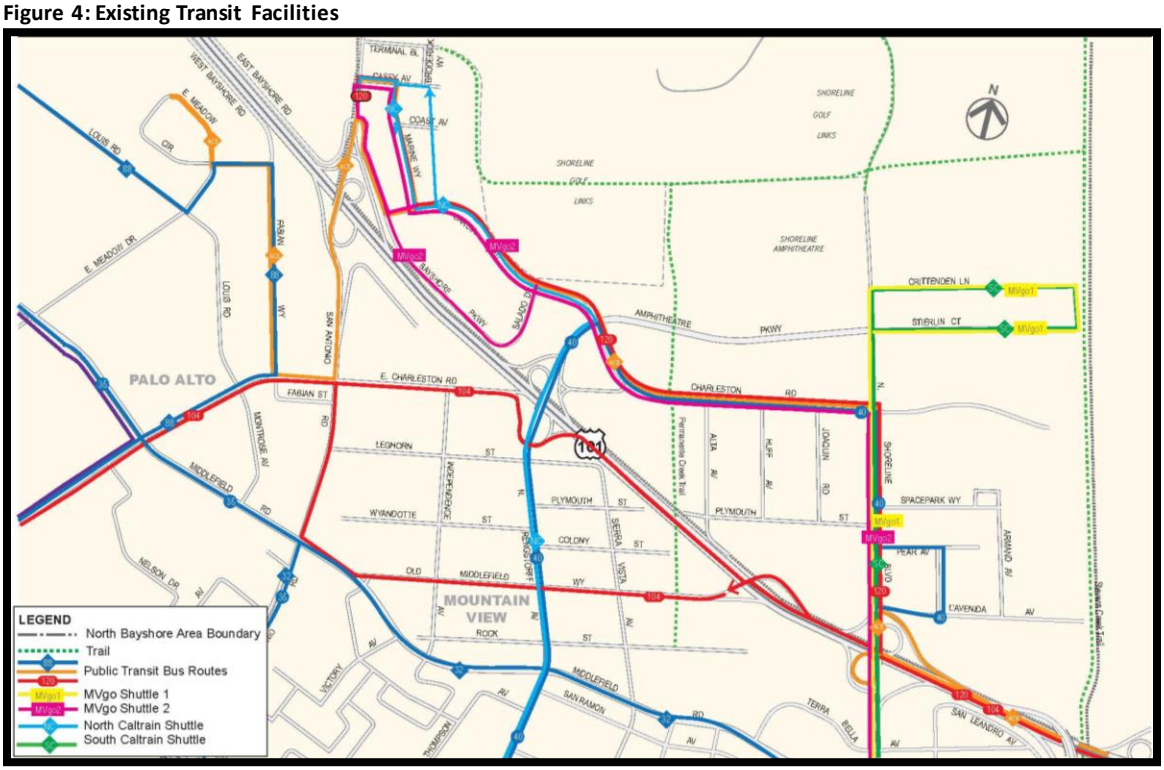
Existing Transit Services

The North Bayshore Area is served by both public (local and regional) and private (employer-based) transit options. Publicly available transit options are operated by various organizations including the Santa Clara Valley Transportation Authority (VTA). VTA provides local service within the City of Mountain View and regional service within Santa Clara County. Routes serving the North Bayshore Area include

- Route 40 – La Avenida and Inigo to Foothill College; and,
- Route 120 – Fremont Bay Area Rapid Transit (BART) to Lockheed Martin Transit Center/Moffett Park.

The public transit services serving the North Bayshore Area are illustrated and discussed in more detail below.

Figure 4: Existing Transit Facilities



ACE Shuttle Service

The Altamont Commuter Express (ACE) is a passenger rail service that extends to San Jose with a stop at the Great America Station in Santa Clara. ACE and VTA provide free "last mile" connections to bring ACE passengers to major employment centers not directly served by the rail line.

The ACE Orange shuttle connects the Great America Station to eastern Palo Alto via US Route 101 Shoreline Boulevard, Charleston Road and San Antonio Road, with stops provided within the North Bayshore Area.

Caltrain

Caltrain provides commuter rail service along the full length of the 51-mile corridor owned and operated by the Peninsula Corridor Joint Powers Board (PCJPB) between San Francisco and San Jose. Caltrain operates bi-directional (both northbound and southbound) services and operates all-day. The closest Caltrain station serving the North Bayshore Area is located at the Downtown Mountain View Transit Center (600 West Evelyn Avenue) approximately one mile southeast of the area.

MVgo

MVgo is a service provided by the Mountain View Transportation Management Association (MTMA), a nonprofit organization comprised of Mountain View businesses and landowners. MVgo provides two shuttle routes that provide service between the Downtown Mountain View Transit Center and various segments of the North Bayshore Area.

Employer-Based Shuttles

Major employers within the North Bayshore Area provide extensive shuttle services that serve as a transit alternative on the primary leg of their employee's journeys. These commuter shuttles are designed to bring employees living in major cities in the San Francisco Bay Area (including but not limited to San Francisco, San Jose, Oakland and other areas of the East and South San Francisco Bay Area) to and from their jobs in the North Bayshore Area. The shuttles are owned and operated by private charter bus companies.

The aforementioned transit options are provided by a variety of bus types. The transit services operating within the North Bayshore area utilize a variety of bus types, with varying capacity to accommodate existing demand.

Bus Types by Service Provider/Company and Approximate Person Capacity

Service Provider/Company	Bus Type (Capacity) [1]		
	Double Decker (Capacity: 81 persons)	Small (up to 31 persons)	Standard (up to 56 persons)
Google	X		X
Microsoft		X	
Intuit		X	X
MVgo		X	
VTA (Route 40)			X
ACE		X	

Source: AECOM, 2015, Fehr & Peers, 2014

Notes:

(1) Bus person capacities by type are estimated using information obtained for similar bus types. Online: http://www.abc-companies.com/bus/new

Figure 5: Bus Definitions and Capacities

Double Decker Bus (81 persons)

Standard Bus (up to 56 persons)

Standard Bus (up to 56 persons)

Small Bus (up to 31 persons)

VTA Bus (50 persons)

MVgo Bus (up to 31 persons)

Existing Bicycle and Pedestrian Facilities

In addition to the Class 2 bicycle facilities provided along Shoreline Boulevard and Rengstorff Avenue, as described above, the North Bayshore Area features an extensive bicycle and pedestrian network. Pedestrian facilities include sidewalks, curb ramps, crosswalks, and off-street paths generally provided along the existing roadway facilities within the North Bayshore Area. Three multi-use trails serve run through the length of the North Bayshore Area, and provide bicycle and pedestrian access to the office, research and development land uses within the area:

- **Permanente Creek Trail** extends south from Shoreline at Mountain View park, over US 101, under Old Middlefield Road and to its current terminus at Rock Street.
- **Stevens Creek Trail** extends south from Shoreline at Mountain View park, under US 101 and Old Middlefield Road and continues through Mountain View to Sunnyvale.
- **Bay Trail runs east-west along San Francisco Bay, north of Shoreline Park at Mountain View**

Methodology

The following section outlines the data collection efforts. Data collected as part of this effort represent the March 2017 conditions at the North Bayshore area. AECOM performed a field reconnaissance to determine the exact traffic count locations for the data collection efforts.

Data Collection – Hose Counts

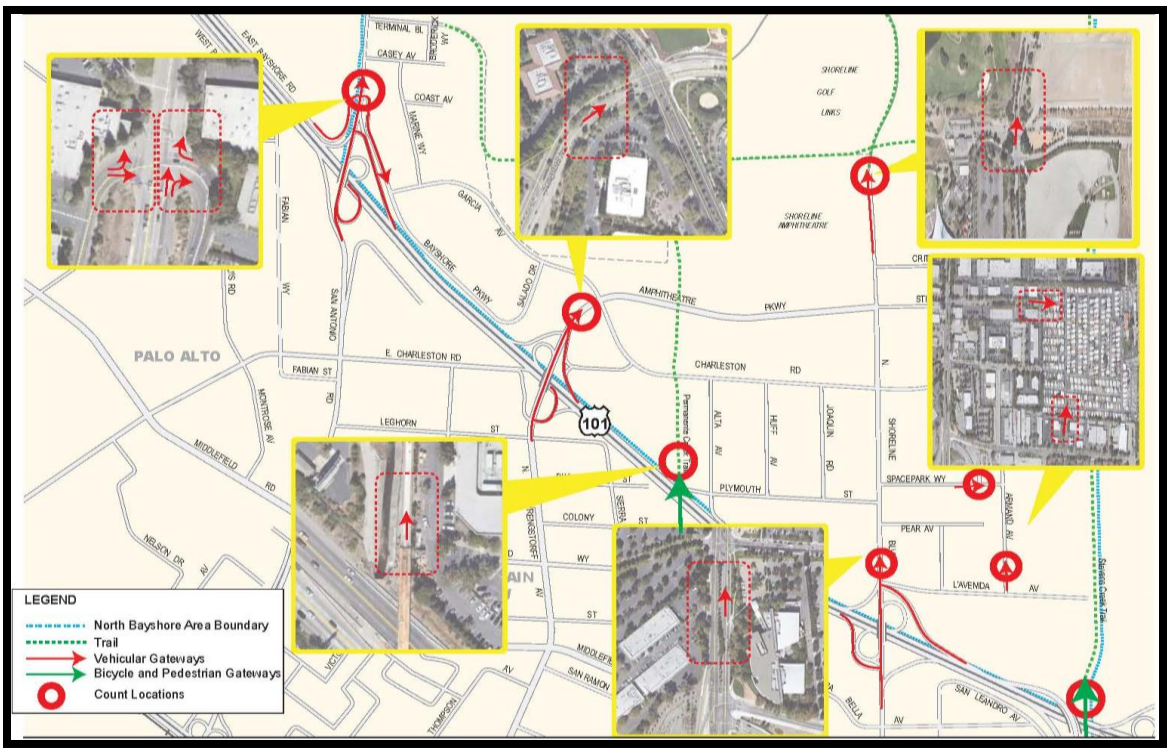
AECOM collected traffic counts using pressure hose vehicle counters. Directional (inbound) traffic counts were collected over a two-week period during three typical fair-weather mid-week work days (Tuesday, Wednesday, and Thursday) when the schools in the surrounding area were in session. Specifically, the counts were conducted on Tuesday, Wednesday, and Thursday of the following weeks (hereafter referred to as the "observation period"):

- Week of March 27, 2017, and
- Week of April 3, 2017.

Similar to the data collection efforts conducted for the *NBPP,* and documented in the *NBPP memo*, the counts took place during the AM peak period (7:00 AM to 10:00 AM), for traffic entering the study area using the gateways identified above.

The hose count data were reported in 15-minute intervals for each of the count locations.

Figure 6: Trip Count Locations



Although La Avenida Street was included as one of the gateways analyzed in the *NBPP memo*, it has not been included in this analysis. La Avenida Street is a one-way street in the westbound direction, and traffic along this street would represent outbound trips. As this analysis only includes inbound trips during the weekday AM peak period, counts from La Avenida Street were omitted.

Additionally, supplemental hose counts were collected at the entries to the Shoreline at Mountain View park and the Santiago Villa Mobile Home Park. ACounts for vehicles accessing the Shoreline park area were conducted on Shoreline Boulevard just north of North Road (the entrance into Shoreline at Mountain View Park). Vehicles accessing the Santiago Villa Mobile Home Park were counted on Space Park Way and Armand Avenue.

Data Collection – Vehicle Classification Counts

Manual vehicle classification counts, including pedestrian and bicycle counts, were conducted at the same gateway locations as the hose counts on Tuesday, March 28, 2017 and Tuesday, April 4, 2017 during the AM peak period (7:00 AM to 10:00 AM). Simultaneously, bicycle and pedestrian counts were conducted on Permanente Creek Trail between US 101 and Charleston Road and Stevens Creek Trail between US 101 and La Avenida Street. The trail count stations were established so that all people inbound into the North Bayshore area were counted (i.e. south of the first trail access to the North Bayshore area).

The purpose of the vehicle classification counts was to determine the number of single-occupancy vehicles (SOV), high occupancy vehicles (HOV) or carpool vehicles (vehicles with two or more people), trucks, transit vehicles, shuttle vehicles, bicyclists, and pedestrians accessing the North Bayshore Area. The transit and shuttle vehicles were further classified by the service provider (if available) and vehicle size, such as double-decker, standard, and small.

Potentially, some bicyclists and pedestrians observed during the classification counts had no destination within the study area, i.e. they proceeded through the study area to access the Shoreline at Mountain View park and the

Santiago Villa Mobile Home Park. Though this study did not count the number of such trips, it is estimated that the proportion of these users is small

Data Collection – Vehicle Occupancy Counts

Private shuttle and public transit occupancy counts were conducted over two days in each week during the observation period. On Thursday, March 30, 2017 and Thursday, April 6, 2017, the data collection effort focused on passenger counts for riders disembarking from Google shuttle buses. The data collection effort on Wednesday, March 29, 2017 and Wednesday, April 5, 2017 concentrated on passengers disembarking from buses operated by other transit and shuttle services providers.

Private Shuttles

Due to company policies, the data collection staff could not board the private buses to count passengers. Therefore, an alternative methodology was developed to provide an estimate of private bus occupancy rates. To determine the occupancy of Google buses, the data collection staff were positioned at six Google bus stop locations in the study area, and counted the number of passengers that alighted at each stop. The bus license plate number and type were also recorded for each bus. These counts were then aggregated using the license plate information to determine the number of passengers alighting from each specific bus within the study area during the morning peak period. As this period is generally associated with inbound commute trips, this methodology is considered an adequate representation of the number of inbound passengers using the Google buses.

LinkedIn and Microsoft Corporation have only one bus stop each and Intuit has two bus stops (adjacent to their office locations). Counts taken of passengers alighting at each stop are considered representative of the inbound private shuttle trips for each company.

Public Transit Vehicles

To determine the occupancy of public transit vehicles (MVgo and VTA), the data collection staff boarded the bus at the first stop each route serves within the North Bayshore area and counted the number of passengers alighting at the stop. Staff proceeded to ride the bus to the next stop, counting all the passengers on the bus while on board. The number of passengers that alighted at the first stop was added to those that rode the bus to the next stop to determine the number of passengers entering the area on each bus.

The data collection staff boarded ACE shuttles at the first shuttle stop location within the North Bayshore area and remained on the bus until the last North Bayshore Area stop. While on board, staff counted the number of people getting off the bus at each stop (including the stop where the counter boarded) to determine the number of people traveling to the North Bayshore area on each ACE shuttle during the morning peak period.

Trip Monitoring Results

The following subsections summarize results of the March 2017 trip monitoring effort.

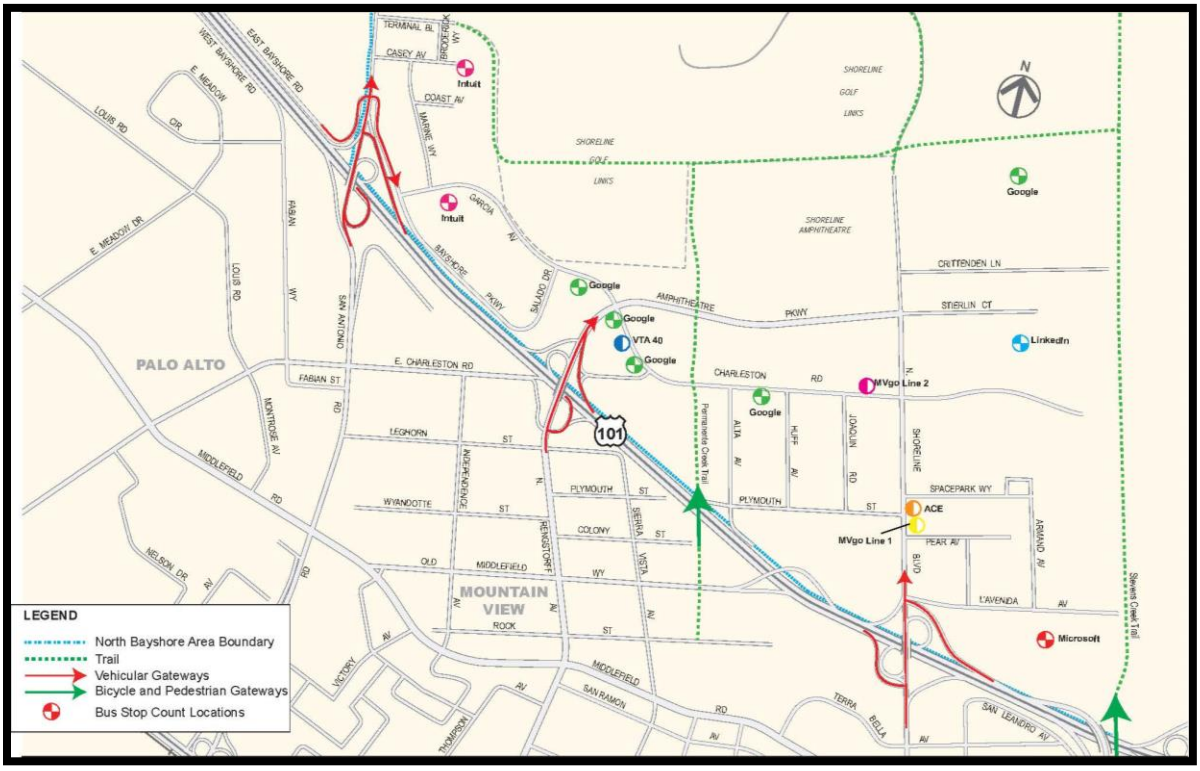
Vehicle Trips

The hose count data obtained during the data collection effort were analyzed to determine the peak period and peak hour vehicle volumes entering the North Bayshore area.

Hose counts on San Antonio Road, between Bayshore Parkway and Casey Avenue are unable to capture vehicles that enter the North Bayshore area and then turn into one of three driveways south of the hose count location, thus, not reaching the hoses. In addition, some vehicles were observed making a westbound right turn at the

intersection of San Antonio Road and Bayshore Parkway – these right-turning vehicles were already within the study area and if counted by the hoses on San Antonio Road would result in double counting. A one-day manual count was conducted on Tuesday, March 28, 2017 to estimate the number of vehicles accessing the three driveways. The estimated volumes entering the North Bayshore area and accessing the driveways before being counted by the hoses were added to the San Antonio Road hose counts (collected between Bayshore Parkway and Casey Avenue) and these modified values are reported herein. Also, the March 28, 2017 manual count showed that a majority of vehicles making the westbound right turn at the San Antonio Road and Bayshore Parkway intersection were accessing the three driveways rather than proceeding further north on San Antonio Road so no adjustment of the hose counts to account for these vehicles was required.

Figure 7: Bus Stop Trip Count Locations



Data Detail

Table 1: Inbound Gateway Volumes

Gateway / Roadway Segment	Weekday AM Peak Period[1]			Weekday AM Peak Hour[1][2]		
	Previous	New Data	Difference	Previous	New Data	Difference
	Sep-2016	March-2017	(Vol. / %)	Sep-2016	March-2017	(Vol. / %)
1. San Antonio Road	2,390	2,350	(-40 / -1.7%)	1,260	1,240	(-20/ -1.6%)
San Antonio Road Between Bayshore Parkway and Casey Avenue	740	790	(+50 / 6.8%)	350	380	(+30/ 8.6%)
Bayshore Parkway Between San Antonio Road and Garcia Avenue	1,650	1,560	(-90 / -5.5%)	910	860	(-50/ -5.5%)
2. Rengstorff Avenue Between US 101 NB Ramps and Garcia Avenue-Charleston Road	4,790	4,380	(-410 / -8.6%)	2,290	2,370	(+80/ 3.5%)
3. Shoreline Boulevard Between US 101 NB Ramps-La Avenida Street and Pear Avenue	5,930	5,250	(-680 / -11.5%)	2,270	2,100	(-170/ -7.5%)
Total	**13,120**	**11,980**	**(-1,130 / -8.6%)**	**5,820**	**5,710**	**(-110/ -1.9%)**

Source: AECOM, 2017.

Notes:

[1] Volumes were rounded to the nearest 10. As a result, some sum totals may be off by 10 vehicles.

[2] Weekday AM peak hour consists of four consecutive 15-minute intervals with the highest recorded traffic volumes. These data show the peak hour to be 9:00-10:00 AM.

Table 2: Inbound Gateway Available Capacity: Peak Period

Gateway / Roadway Segment	Weekday AM Peak Period[1]				
	Gateway Capacity	Previous		New Data	
		Sep-2016		Mar-2017	
		Vehicle Volume	Available Capacity	Vehicle Volume	Available Capacity
1. San Antonio Road	4,140	2,390	1,760	2,350	1,790
San Antonio Road Between Bayshore Parkway and Casey Avenue	1,250	740	510	790	460
Bayshore Parkway Between San Antonio Road and Garcia Avenue	2,900	1,650	1,250	1,560	1,340
2. Rengstorff Avenue Between US 101 NB Ramps and Garcia Avenue-Charleston Road	8,020	4,790	3,230	4,380	3,640
3. Shoreline Boulevard Between US 101 NB Ramps-La Avenida Street and Pear Avenue	6,740	5,930	810	5,250	1,490
Total	**18,900**	**13,120**	**5,790**	**11,980**	**6,920**

Source: AECOM, 2017.
Notes:
[1] Volumes were rounded to the nearest 10. As a result, some sum totals may be off by 10 vehicles.

Table 3: Inbound Gateway Available Capacity: Peak Hour

Gateway / Roadway Segment	Weekday AM Peak Hour[1][2]				
	Gateway Capacity	Previous		New Data	
		Sep-2016		Mar-2017	
		Vehicle Volume	Available Capacity	Vehicle Volume	Available Capacity
1. San Antonio Road	1,530	1,260	270	1,240	290
San Antonio Road Between Bayshore Parkway and Casey Avenue	460	350	110	380	80
Bayshore Parkway Between San Antonio Road and Garcia Avenue	1,070	910	160	860	210
2. Rengstorff Avenue Between US 101 NB Ramps and Garcia Avenue-Charleston Road	2,960	2,290	670	2,370	590
3. Shoreline Boulevard Between US 101 NB Ramps-La Avenida Street and Pear Avenue	2,490	2,270	220	2,100	390
Total	**6,980**	**5,820**	**1,160**	**5,710**	**1,270**

Source: AECOM, 2017.
[1] Volumes were rounded to the nearest 10. As a result, some sum totals may be off by 10 vehicles.
[2] Weekday AM peak hour consists of four consecutive 15-minute intervals with the highest recorded traffic volumes. These data show the peak hour to be 9:00-10:00 AM.

Table 4: Inbound Gateway Available Capacity: Non Peak Hour

Gateway / Roadway Segment	Weekday AM Non Peak Hour, Peak Period 7:00 AM to 9:00 AM [1]				
	Gateway Capacity	Previous		New Data	
		Sep-2016		Mar-2017	
		Vehicle Volume	Available Capacity	Vehicle Volume	Available Capacity
1. San Antonio Road	2,610	1,140	1,470	1,310	1,300
San Antonio Road Between Bayshore Parkway and Casey Avenue	790	390	400	460	330
Bayshore Parkway Between San Antonio Road and Garcia Avenue	1,830	740	1,090	850	980
2. Rengstorff Avenue Between US 101 NB Ramps and Garcia Avenue-Charleston Road	5,060	2,500	2,560	2,500	2,560
3. Shoreline Boulevard Between US 101 NB Ramps-La Avenida Street and Pear Avenue	4,250	3,660	590	3,470	780
Total	**11,920**	**7,300**	**4,620**	**7,280**	**4,640**

Source:AECOM, 2017.
[1] Volumes were rounded to the nearest 10. As a result, some sum totals may be off by 10 vehicles.

Table 5: Inbound Gateway Available Capacity: Pre and Post Peak Period

Gateway / Roadway Segment	Weekday AM Pre and Post Peak Period [1]			
	Previous		New Data	
	Sep-2016		Mar-2017	
	6:00 – 7:00 AM	10:00 – 11:00 AM	6:00 – 7:00 AM	10:00 – 11:00 AM
1. San Antonio Road	210	690	230	570
San Antonio Road Between Bayshore Parkway and Casey Avenue	90	260	130	220
Bayshore Parkway Between San Antonio Road and Garcia Avenue	120	430	100	350
2. Rengstorff Avenue Between US 101 NB Ramps and Garcia Avenue-Charleston Road	380	1,770	380	1,980
3. Shoreline Boulevard Between US 101 NB Ramps-La Avenida Street and Pear Avenue	770	2,210	780	2,110
Total	**1,360**	**4,670**	**1,390**	**4,660**

Source:AECOM, 2017.
Notes:
[1] Volumes were rounded to the nearest 10. As a result, some sum totals may be off by 10 vehicles.

Table 6: Inbound Vehicles by Mode: Peak Period

Travel Mode	Weekday AM Peak Period			
	Previous		New Data	
	Sep-2016		Mar-2017	
	Volume	Proportion	Volume	Proportion
Auto	**12,521**	**84.8%**	**12,042**	**86.6%**
Single-Occupancy Vehicle	*10,917*	*75.5%*	*10,827*	*77.8%*
High Occupancy Vehicle	*1,439*	*9.4%*	*1,215*	*8.7%*
Transit	**361**	**2.5%**	**316**	**2.3%**
Employer Based Bus	*319*	*2.2%*	*285*	*2.0%*
Double Decker	*87*	*0.6%*	*91*	*0.7%*
Small	*79*	*0.5%*	*54*	*0.4%*
Standard	*153*	*1.0%*	*140*	*1.0%*
Public Transit Bus	*43*	*0.3*	*31*	*0.2%*
MVgo	*18*	*0.1%*	*14*	*0.1%*
VTA	*22*	*0.1%*	*14*	*0.1%*
ACE	*3*	*0.0%*	*3*	*0.0%*
Other[1]	**237**	**1.6%**	**192**	**1.4%**
Bicycle	**1,366**	**9.3%**	**1,108**	**8.0%**
Pedestrian	**272**	**1.8%**	**251**	**1.8%**
All Modes Total[2]	**14,757**	**100.0%**	**13,909**	**100.0%**

Source: AECOM, 2017.
(1) The "Other" category includes motorcycles, trucks, and intercampus Google shuttles.
(2) Sum totals may not match due to rounding.

Table 7: Inbound Vehicles by Mode: Peak Hour

Travel Mode	Weekday AM Peak Hour[2]			
	Previous		New Data	
	Sep-2016		Mar-2017	
	Volume	Proportion	Volume	Proportion
Auto	**5,405**	**57.6%**	**5,012**	**58.8%**
Single-Occupancy Vehicle	*4,828*	*45.2%*	*4,493*	*47.2%*
High Occupancy Vehicle	*577*	*12.3%*	*519*	*11.6%*
Transit	**148**	**34.8%**	**118**	**34.4%**
Employer Based Bus	*128*	*33.9%*	*106*	*33.8%*
Double Decker	*37*	*12.7%*	*34*	*14.4%*
Small	*32*	*3.1%*	*19*	*2.1%*
Standard	*59*	*18.2%*	*53*	*17.3%*
Public Transit Bus	*20*	*0.9%*	*12*	*0.6%*
MVgo	*6*	*0.5%*	*6*	*0.4%*
VTA	*12*	*0.3%*	*5*	*0.1%*
ACE	*2*	*0.2%*	*1*	*0.1%*
Other[1]	**89**	**1.0%**	**88**	**0.8%**
Bicycle	**532**	**5.5%**	**497**	**4.8%**
Pedestrian	**100**	**1.1%**	**103**	**1.1%**
All Modes Total[3]	**6,274**	**100.0%**	**5,818**	**100.0%**

Source: AECOM, 2017.
Notes:
[1] The "Other" category includes motorcycles, trucks, and intercampus Google shuttles.
[2] Weekday AM peak hour consists of four consecutive 15-minute intervals with the highest recorded motor vehicle volumes (9:00-10:00 AM).
[3] Sum totals may not match due to rounding.

Table 8: Vehicle Classification by Mode

Classification	Weekday AM Peak Period[1][4]			Weekday AM Peak Hour[1][3][4]		
	Previous	New Data	Difference	Previous	New Data	Difference
	Sep-2016	Mar-2017		Sep-2016	Mar-2017	
Drive Alone (SOV)	*75.5%*	*77.8%*	+2.3%	*77.0%*	**77.2%**	+0.2%
Carpool (HOV)	*9.4%*	*8.7%*	-0.7%	*9.2%*	*8.9%*	-0.3%
Transit / Shuttle	2.5%	**2.3%**	-0.2%	2.4%	*2.0%*	-0.4%
Other[2]	1.6%	**1.4%**	-0.2%	1.4%	**1.5%**	0.1%
Bicycle	9.3%	**8.5%**	-0.8%	8.5%	**8.5%**	0.0%
Pedestrian	1.8%	**1.6%**	-0.2%	1.6%	**1.8%**	+0.2%

Source: AECOM, 2017.

Notes:

[1] Classification percentages are rounded to the nearest tenth of a number.

[2] The "Other" category includes motorcycles, trucks, and intercampus Google shuttles.

[3] Weekday AM peak hour consists of four consecutive 15-minute intervals with the highest recorded motor vehicle volumes (9:00-10:00 AM).

[4] Sum totals may not match due to rounding.

Table 9: Inbound Person-Trips by Mode: Peak Period

Travel Mode	Weekday AM Peak Period			
	Previous		New Data	
	Sep-2016		Mar-2017	
	Person-Trips	Mode Share	Person-Trips	Mode Share
Auto	**14,177**	**57.6%**	**13,500**	**58.8%**
Single-Occupancy Vehicle	*11,141*	*45.2%*	*10,827*	*47.2%*
High Occupancy Vehicle[1]	*3,036*	*12.3%*	*2,673*	*11.6%*
Transit	***8,571***	**34.8%**	**7,895**	**34.4%**
Employer Based Bus	*8,356*	*33.9%*	*7,760*	*33.8%*
Double Decker	*3,115*	*12.7%*	*3,303*	*14.4%*
Small	*758*	*3.1%*	*481*	*2.1%*
Standard	*4,483*	*18.2%*	*3,976*	*17.3%*
Public Transit Bus	*215*	*0.9%*	*135*	*0.6%*
MVgo	*113*	*0.5%*	*90*	*0.4%*
VTA	*62*	*0.3%*	*18*	*0.1%*
ACE	*40*	*0.2%*	*27*	*0.1%*
Other[2]	**237**	**1.0%**	**192**	**0.8%**
Bicycle	**1,366**	**5.5%**	**1,108**	**4.8%**
Pedestrian	**272**	**1.1%**	**251**	**1.1%**
All Modes Total[3]	**24,623**	**100.0%**	**22,946**	**100.0%**

Source: AECOM, 2017.

Notes:

[1] An average vehicle occupancy of 2.2 persons per vehicle, derived from the American Community Survey, was used to determine the HOV person trips.

[2] The "Other" category includes motorcycles, trucks, and intercampus Google shuttles at one person-trip per vehicle.

[3] Sum totals may not match due to rounding.

Table 10: Inbound Person-Trips by Mode: Peak Hour

Travel Mode	Weekday AM Peak Hour[3]			
	Previous		New Data	
	Sep-2016		Mar-2017	
	Person-Trips	Mode Share	Person-Trips	Mode Share
Auto	**6,097**	**63.2%**	**5,635**	**66.8%**
Single-Occupancy Vehicle	*4,828*	*50.1%*	*4,493*	*53.3%*
High Occupancy Vehicle[1]	*1,269*	*13.2%*	*1,142*	*13.5%*
Transit	**2,825**	**29.3%**	**2,111**	**25.0%**
Employer Based Bus	*2,755*	*28.6%*	*2,056*	*24.4%*
Double Decker	*1,203*	*12.5%*	*898*	*1247.2%*
Small	*189*	*2.0%*	*72*	*0.9%*
Standard	*1,363*	*14.1%*	*1,087*	*12.9%*
Public Transit Bus	*85*	*0.9%*	*54*	*0.6%*
MVgo	*46*	*0.5%*	*44*	*0.5%*
VTA	*7*	*0.1%*	*5*	*0.1%*
ACE	*18*	*0.2%*	*5*	*0.1%*
Other[2]	**89**	**0.9%**	**88**	**1.0%**
Bicycle	**532**	**5.5%**	**497**	**5.9%**
Pedestrian	**100**	**1.0%**	**103**	**1.2%**
All Modes Total[4]	**9,643**	**100.0%**	**8,434**	**100.0%**

Source: AECOM, 2017.
Notes:
[1] An average vehicle occupancy of 2.2 persons per vehicle, derived from the American Community Survey, was used to determine the HOV person trips.
[2] The "Other" category includes motorcycles, trucks, and intercampus Google shuttles at one person-trip per vehicle.
[3] Weekday AM peak hour consists of four consecutive 15-minute intervals with the highest recorded motor vehicle volumes (9:00-10:00 AM).
[4] Sum totals may not match due to rounding.

Table 11: Inbound Person-Trips Mode Share

Classification	Weekday AM Peak Period[1]			Weekday AM Peak Hour[1][3]		
	Previous	New Data	Difference	Previous	New Data	Difference
	Sep-2016	Mar-2017		Sep-2016	Mar-2017	
Drive Alone (SOV)	45.2%	47.2%	+1.9%	*50.1%*	*53.3%*	+3.2%
Carpool (HOV)	12.3%	11.6%	-0.7%	*13.2%*	*13.5%*	+0.4%
Transit / Shuttle	34.8%	34.4%	-0.4%	*29.3%*	*25.0%*	-4.3%
Other[2]	1.0%	0.8%	-0.1%	*0.9%*	*1.0%*	+0.1%
Bicycle	5.5%	4.8%	-0.7%	*5.5%*	*5.9%*	+0.4%
Pedestrian	1.1%	1.1%	0.0%	*1.0%*	*1.2%*	+0.2%

Source:AECOM, 2017.

Notes:

[1] Classification percentages were rounded to the nearest tenth of a number.

[2] The "Other" category includes motorcycles, trucks, and intercampus Google shuttles at one person-trip per vehicle.

[3] Weekday AM peak hour consists of four consecutive 15-minute intervals with the highest recorded motor vehicle volumes (9:00-10:00 AM).