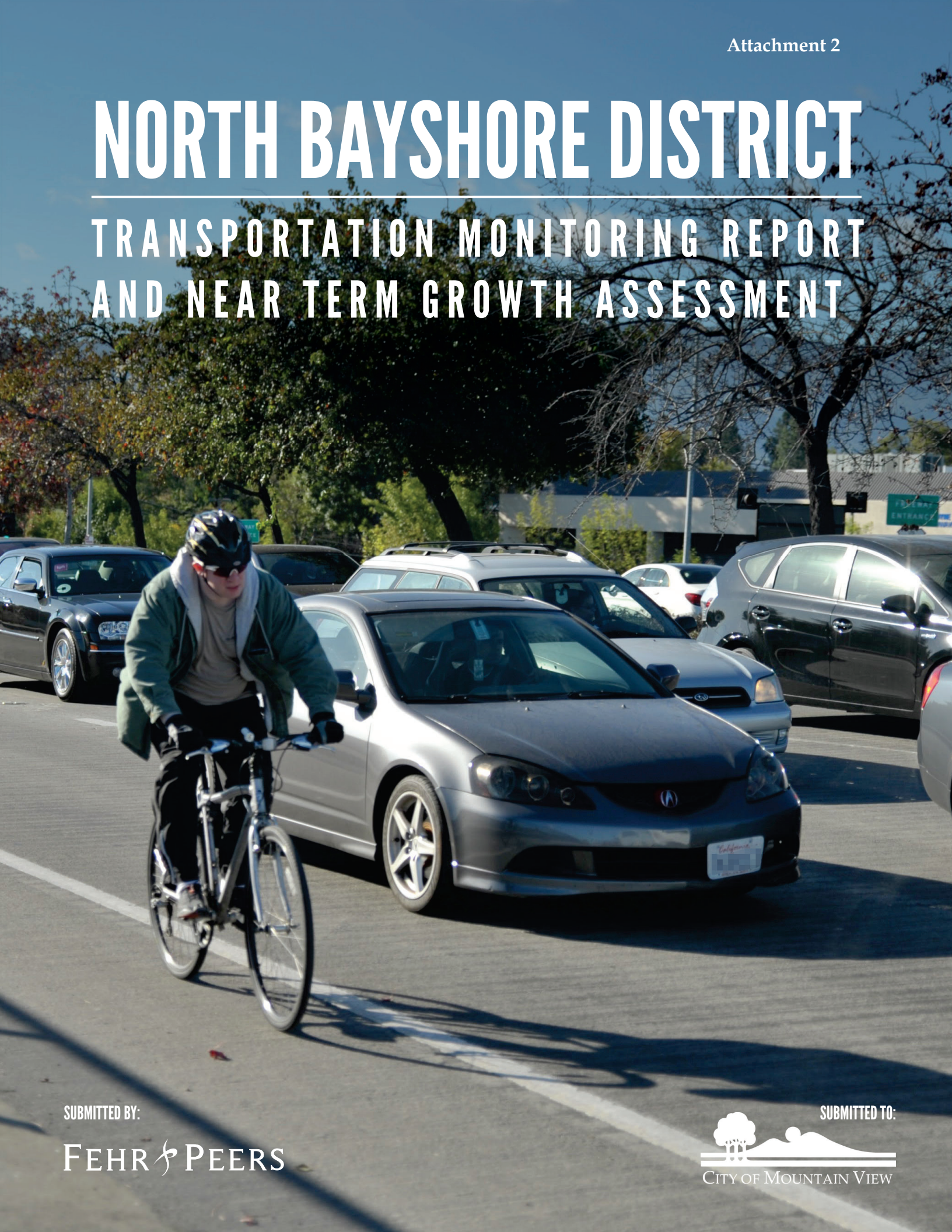
Attachment 2

NORTH BAYSHORE DISTRICT

TRANSPORTATION MONITORING REPORT AND NEAR TERM GROWTH ASSESSMENT



SUBMITTED BY:

FEHR & PEERS

SUBMITTED TO:

CITY OF MOUNTAIN VIEW

Final Report

Spring 2020 North Bayshore District Transportation Monitoring and Near-Term Growth Assessment

Prepared for:
City of Mountain View, California

May 2020

SJ19-1963

FEHR & PEERS

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Key Findings

This report summarizes the results of the Spring 2020 North Bayshore District Transportation Monitoring and Near-Term Growth Assessment. Since February of 2014, the City of Mountain View has collected data on vehicle and person trips in the North Bayshore District during the morning 3-hour peak period. Below is a summary of the key findings of this report (all findings are for two-way volumes, unless otherwise noted).

- **Gateway Trip Cap Monitoring Overview**: The 2014 and 2017 North Bayshore Precise Plans both contain vehicle trip cap policies for the North Bayshore gateways. The Spring 2020 traffic volumes are compared below to both these Precise Plan versions for the sake of completeness. The 2017 NBPP policy focuses on two-way travel (i.e., inbound, and outbound combined, both in the morning and the evening) in anticipation of a more directionally balanced traffic pattern that would occur as more residential is added in North Bayshore. The 2014 NBPP policy focuses only on the inbound direction of travel during the morning, in recognition of the directionally peaked traffic patterns that currently exist due to the high proportion of office uses.

  The results of both comparisons produce similar conclusions, in that both the Shoreline and Rengstorff gateways are very close to, or slightly exceed, their respective trip caps.

- **Gateway Trip Cap Monitoring (2017 North Bayshore Precise Plan-Two-Way Capacity)**: San Antonio Road gateway is under its peak hour vehicle trip cap during both the morning and evening. However, the Shoreline Boulevard gateway exceeds its vehicle trip cap by 2% during the morning peak hour, and Rengstorff Avenue gateway exceeds its vehicle trip cap by 3% during the afternoon peak hour. Please see **Table ES-1** for additional information.

- **Gateway Trip Cap Monitoring (2014 North Bayshore Precise Plan-Directional Capacity)**: Each of the three gateways are below their peak hour vehicle trip cap during both the morning and evening. However, Shoreline Boulevard is essentially at its vehicle trip cap during the morning peak hour, while the Rengstorff gateway is 3% below its vehicle trip cap during the evening peak hour. Please see **Table ES-2** for additional information.

- **Morning Peak Period and Peak Hour**: The morning vehicle 3-hour peak period is from 8:00 to 11:00 AM, with the peak hour occurring from 9:00 to 10:00 AM.

- **Evening Peak Period and Peak Hour**: The evening vehicle 3-hour peak period is from 4:00 to 7:00 PM, with the peak hour occurring from 5:00 to 6:00 PM.

- **Morning Combined Gateway Mode Share**: In the morning peak hour, people enter North Bayshore using the following modes: 57% in single-occupant vehicles (SOVs), 11% in shared-ride vehicles, 28% on transit, 3% biking, and 1% walking. The morning inbound peak hour SOV mode share has varied since monitoring began, from as low as 49% in the Fall of 2017 to as high as 60% in Spring of 2016.

- **Evening Combined Gateway Mode Share**: In the evening peak hour, people exit North Bayshore using the following modes: 55% in single-occupant vehicles, 15% in shared-ride vehicles, 25% on transit, 4% biking, and 1% walking.
- **Shoreline Boulevard Peak Vehicle Volume**: The Shoreline Boulevard gateway experiences consistently high volumes between 5:30 and 10:00 AM.
- **Rengstorff Avenue Peak Vehicle Volume**: The Rengstorff Avenue Gateway experiences a more peaked traffic pattern during the morning 3-hour peak period, with very high volumes from 8:30 to 9:30 AM.
- **Most Used Gateways in the Morning**: Rengstorff Avenue and Shoreline Boulevard are the most heavily used gateways into the North Bayshore District; between them, they accommodate over 80% of the vehicles that enter the district in the morning.
- **Least Used Gateway in the Morning**: The San Antonio Road Gateway is the most lightly used in the morning, although it still exhibits a distinct peak in traffic between 8:30 and 9:30 AM.
- **Most Used Gateway in the Evening**: The Shoreline Boulevard Gateway carries the most traffic during the evening peak hour and 3-hour peak period; many commuters use Shoreline Boulevard to exit the North Bayshore area in the afternoon, and it is also used by people coming into North Bayshore in the evening for entertainment or other trips.
- **Most Used Gateways by Transit Vehicles**: During the morning peak hour, the Rengstorff Avenue and San Antonio Road Gateways serve over 95% of all transit riders. During the evening peak hour, the Rengstorff Avenue and San Antonio Road Gateways serve over 80% of all transit riders.
- **Existing Business Gateway Vehicle Trip Reduction**: Existing businesses in North Bayshore must continue to decrease their vehicle trips in/out of North Bayshore to accommodate development in the North Bayshore District.
- **Improved Gateway Utilization**: The NBPP transportation framework requires more effective use of the existing physical capacity of the gateways to accommodate future development. The Near-Term growth assessment of the planned seven developments indicates that the Shoreline gateway could exceed capacity if each of the gateways is not more effectively utilized. Additional NBPP transportation strategies and/or priority transportation infrastructure would need to be implemented to accommodate this finding.

Table ES-1: 2017 NBPP Gateway Trip Target Evaluation – Two-Way, Peak Hour

Gateway	Morning				Evening			
	Spring 2020 Volume	Target	Remaining Gateway Capacity	Percent of Gateway Capacity Remaining	Spring 2020 Volume	Target	Remaining Gateway Capacity	Percent of Gateway Capacity Remaining
San Antonio Road	1,590	1,890	300	16%	1,080	1,830	750	41%
Rengstorff Avenue	2,890	3,290	400	12%	2,510	2,440	-70	-3%
Shoreline Boulevard	3,170	3,110	-60	-2%	3,150	3,760	610	16%
Total	**7,650**	**8,290**	**640**	**8%**	**6,740**	**8,030**	**1,290**	**16%**

Notes:
1. Volumes rounded to nearest 10.
2. Target = 2017 NBPP vehicle trip target = two-way peak hour.
Source: Fehr & Peers, 2020.

Table ES-2: 2014 NBPP Gateway Trip Target Evaluation – Directional, Peak Hour

Gateway	Morning				Evening			
	Spring 2020 Volume	Target	Remaining Gateway Capacity	Percent of Gateway Capacity Remaining	Spring 2020 Volume	Target	Remaining Gateway Capacity	Percent of Gateway Capacity Remaining
San Antonio Road	1,350	1,530	180	12%	850	1,340	490	37%
Rengstorff Avenue	2,480	2,960	480	16%	2,020	2,090	70	3%
Shoreline Boulevard	2,480	2,490	10	0%	2,410	2,730	320	12%
Total	**6,310**	**6,980**	**670**	**10%**	**5,280**	**6,160**	**880**	**14%**

Notes:
3. Volumes rounded to nearest 10.
4. Target = 2017 NBPP vehicle trip target = two-way peak hour.
Source: Fehr & Peers, 2020.

NORTH BAYSHORE DISTRICT TRANSPORTATION MONITORING

1. North Bayshore District Transportation Monitoring

The North Bayshore District has a vehicle trip cap for each of the three gateways (roadways). The vehicle trip caps are specified in the *North Bayshore Precise Plan* (adopted December 2017). The performance of the gateways relative to the caps are monitored twice a year in the Spring and Fall. The City uses this report to evaluate whether current North Bayshore development and travel behavior is conforming to the vehicle trip caps and other NBPP policy goals. In the past two years, the vehicle classification and bus occupancy observation periods have been expanded from three hours to four hours to ensure that the peak period person demand is fully captured.[1]

Section Organization

The following information is contained in this chapter:

- **Data Collection** – This section describes the types of transportation data gathered.
- **Existing Transportation Network** – This section describes the existing transportation network at the time of the data collection activities.
- **Existing Travel Patterns** – This section describes the results of the gateway vehicle counts (gateway volumes), gateway mode splits and queuing observations.
- **Traffic Trends Over Time** – This section presents gateway inbound morning 3-hour peak period volume and mode split data for this and previous monitoring cycles, and describes the resulting trends over time.
- **Gateway Queuing Observations** – This section describes vehicle queuing observations, including the times when vehicle queues begin to increase and to decrease, and vehicle queue length estimates.

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[1] COVID-19 Note: The North Bayshore Gateway observations reported in this document were collected at the beginning of February 2020 prior to voluntary shelter-in-place polices by large technology firms in the Bay Area beginning the first week in March 2020 or the shelter-in-place rules issued by Santa Clara County Public Health Department that took effect on March 17, 2020 to slow the spread of COVID-19. This data was collected before these substantial changes in travel patterns occurred. Looking ahead, these changes in travel patterns are likely to prevail for many months, which will be considered when embarking upon future monitoring efforts.

- **Definition of Gateway Capacity** – This section describes the gateway capacity and trip target options.
- **Gateway Trip Target Evaluation** – This section presents the observed two-way volumes and compares to the vehicle trip caps. This section also compares to potential alternative trip targets.

Data Collection

To fully assess transportation conditions at the North Bayshore District gateways, the following data was collected:

- Daily (24-hour) traffic counts at ten roadway locations throughout North Bayshore (including the gateways), and 4-hour peak period turning movement counts at two key intersections;
- Peak period vehicle classification observations at seven roadway locations;
- Peak period bus occupancy observations at 17 bus stop locations that serve both public and private transit vehicles; and
- Observations of vehicle queuing during peak demand periods near the Shoreline and Rengstorff gateways.

All data was collected on a Tuesday, Wednesday and/or Thursday between February 2nd and February 15th, 2020. A complete description of the data collection methods can be found in **Appendix A**.

Existing Transportation Network

Each North Bayshore District Transportation Monitoring report represents a snapshot in time of the travel behavior at the North Bayshore gateways. Over time, the transportation network and land uses will change. This section documents the existing streets, pedestrian, bicycle, and transit facilities at the time of the data collection. Changes from the previous monitoring report are noted in *italics*.

Street System

US 101 and SR 85 provide regional access to the study area. The following streets provide local access and are considered the North Bayshore gateways: Shoreline Boulevard, La Avenida, Rengstorff Avenue, San Antonio Road, and Bayshore Parkway. These freeways and streets are shown on **Figure 1**.

Figure 1

Existing Street System

Pedestrian Facilities

Pedestrian facilities include sidewalks, curb ramps, crosswalks and off-street paths that are meant to provide safe and convenient routes for pedestrians to access destinations such as institutions, businesses, public transportation and recreation facilities. Most streets in North Bayshore include at least a four-foot wide sidewalk on one or both sides, but some do not. **Figure 2** shows the gaps in the existing sidewalk system.

Bicycle Facilities

The bicycle network supports bicycling for both commuting and recreational purposes. **Figure 3** shows the location of existing bicycle facilities and the city's trail network, including pedestrian/bicycle crossings and barriers to pedestrian and bicycle travel.

Transit Service

North Bayshore is served by both public transit and private shuttle services. Public transit routes that serve the North Bayshore area include Santa Clara Valley Transportation Authority (VTA) Route 40, Express Route 185, and Orange Line, as well as two MVgo routes. Private shuttle services are operated by Google, Microsoft[2] and Intuit. **Figure 4** displays the existing public transit routes in and near the North Bayshore District, and **Table 1** shows the span of service and frequency of the public transit routes that serve North Bayshore. **Figure 5** shows route information for the private shuttle services.

[2] Microsoft shuttle is furloughed due to the construction of the new building.

Table 1: Existing Transit Service

Route	From	To	Weekdays			Weekends	
			Operating Hours	Headway (minutes)[1]		Operating Hours	Headway (minutes)[1]
				Peak	Mid-Day		
Express Buses							
185	Gilroy Transit Center	Mountain View	6:00 to 9:45 AM (N) 4:15 to7:45 PM (S)	10	No Service	No Weekend Service	
Bus							
40	Foothill College	Mountain View Transit Center	6:30 AM to 10:30 PM (N) 6:13 AM to 10:05 PM (S)	10	30	8:15 AM to 7:00 PM	10
Shuttles							
Orange Line	Mountain View Station	Alum Rock Station	5:00 AM to 12:50 PM (E) 4:42 AM to 1:15 AM (W)	5	10	5:50 AM to 1:00 AM	5
MVgo West Bayshore	Downtown Mountain View Transit Center	Casey Avenue/ Intuit Main Street	6:45 AM to 10:45 AM & 3:00 to 8:45 PM	15	N/A	No Weekend Service	
MVgo East Bayshore	Downtown Mountain View Transit Center	Crittenden Lane	7:14 AM to 10:18 AM 4:01 PM to 8:17 PM	20	N/A	No Weekend Service	

Notes:
1. Headways are defined as the time between transit vehicles on the same route.
Source: VTA, ACE and MVgo, 2020.

Figure 2

Sidewalk Gaps

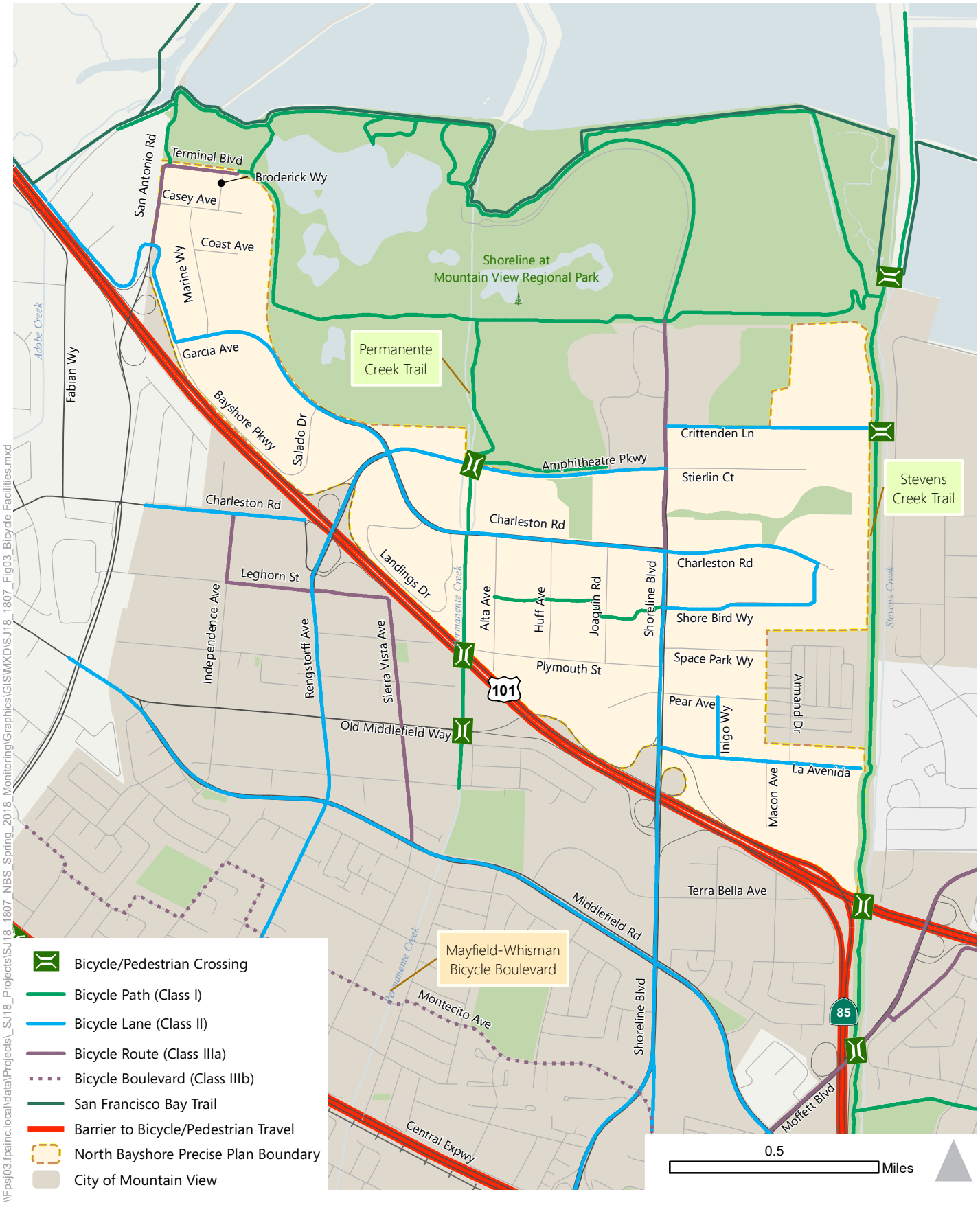
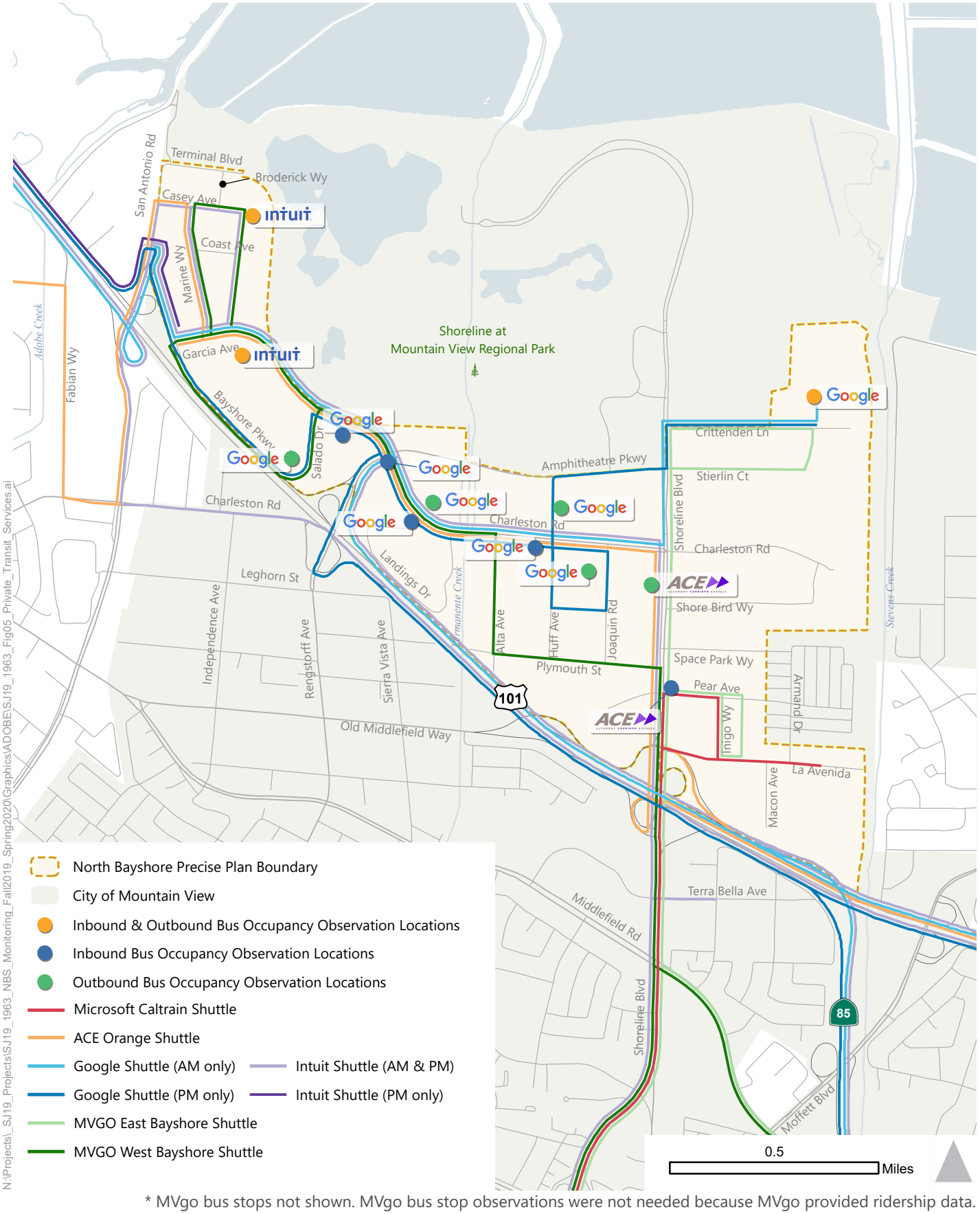


Figure 3

Existing Bicycle Facilities

Figure 4

Existing Transit Service in North Bayshore



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* MVgo bus stops not shown. MVgo bus stop observations were not needed because MVgo provided ridership data.

Figure 5

Private Transit Services

Existing Travel Patterns

This section presents information regarding vehicles and persons entering and exiting the North Bayshore District. This includes gateway vehicle counts, vehicle traffic patterns by time of day, gateway volume-to-vehicle trip cap comparisons, and mode split.

Gateway Vehicle Counts

Vehicle usage of the North Bayshore gateways is presented below using several figures and graphics. This information establishes the current usage of all North Bayshore gateways combined, as well as at each gateway individually. Morning and evening peak hour and 3-hour peak period two-way total volumes are presented. For comparison to previous monitoring reports, this report presents the results for inbound traffic only. Detailed traffic counts are included as **Appendix B** of this report.

As shown in **Figure 6**, the three vehicular access points to the North Bayshore district are San Antonio Road, Rengstorff Avenue, and Shoreline Boulevard. **Table 2** below presents the inbound, outbound and total vehicle counts at each gateway, both for the peak hour and for the 3-hour peak period.

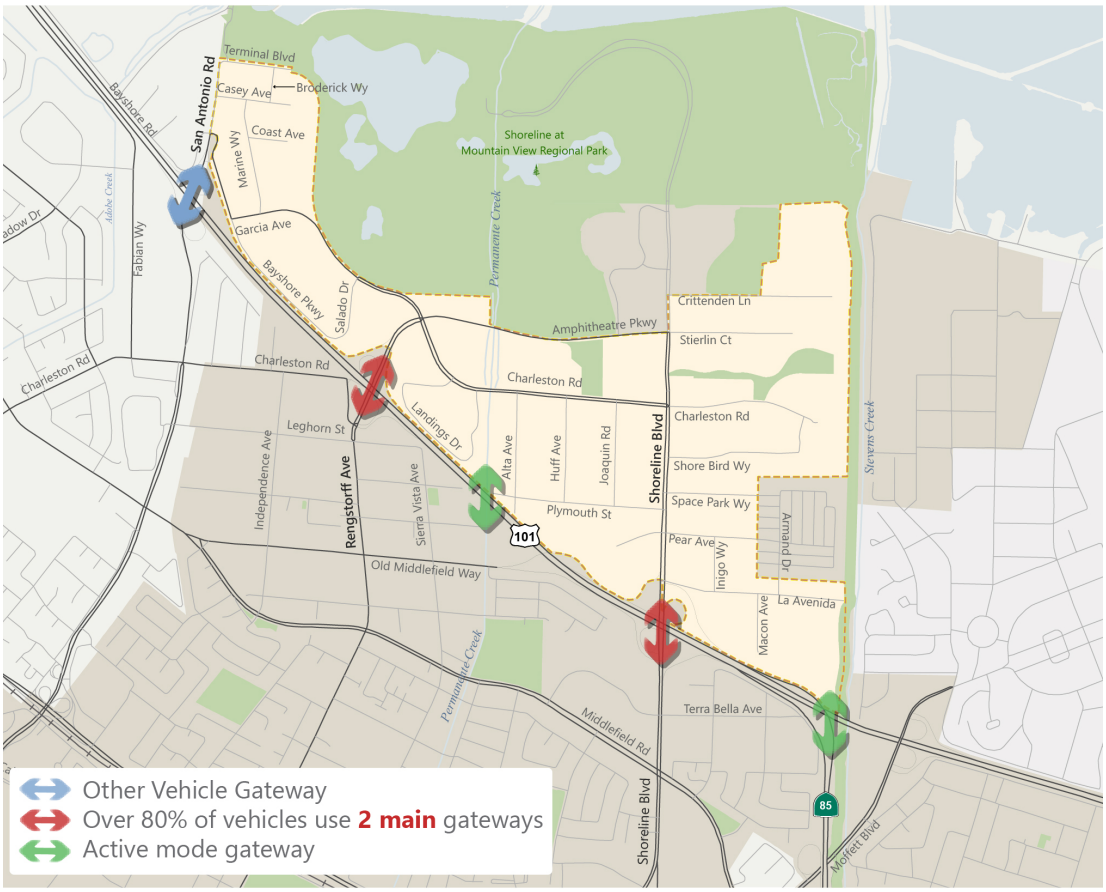


Figure 6: Preferred Access to North Bayshore

San Antonio Road is the most lightly used of the three gateways, carrying less than 20% of the vehicular traffic. Shoreline Boulevard and Rengstorff Avenue have similar levels of usage in the morning during the peak hour; in the afternoon, Shoreline is more heavily used, likely because it allows direct access to a wider range of land uses that are active later in the day (such as the movie theater, the Shoreline Amphitheatre and Regional Park, and the residential uses at the Santiago Villa Mobile Home Park).

Table 2: Spring 2020 Gateway Vehicle Volumes

Gateway	Morning			Evening		
	Inbound	Outbound	Total	Inbound	Outbound	Total
Peak Hour						
San Antonio Road	1,350	240	1,590	230	850	1,080
Rengstorff Avenue	2,480	410	2,890	490	2,020	2,510
Shoreline Boulevard	2,480	690	3,170	740	2,410	3,150
Total	**6,310**	**1,340**	**7,650**	**1,460**	**5,280**	**6,740**
3-Hour Peak Period						
San Antonio Road	3,120	800	3,920	690	2,090	2,780
Rengstorff Avenue	6,130	1,230	7,360	1,360	5,150	6,510
Shoreline Boulevard	7,220	2,100	9,320	2,150	6,750	8,900
Total	**16,470**	**4,130**	**20,600**	**4,200**	**13,990**	**18,190**

Notes:

1. Due to the power failure of the tube count machine for the outbound La Avenida on Thursday February 13th, the tube count data collected on Thursday 20th was used. In addition, due to an anomaly in the tube count results (low number of vehicles counted) on Thursday, February 6th for the outbound San Antonio Road, only the average of five days (February 4th and 5th and February 11th to February 13th) count data was used.
2. Vehicle volumes rounded to nearest 10.

Source: Fehr & Peers, 2020.

The volumes reported in the monitoring report are an average of a multiday observation. The gateway volumes presented in **Table 2** take into account the day-to-day variation and provide a buffer (described below and in **Appendix C**) when comparing to the gateway trip target. We report the average because of the natural day-to-day variation in traffic volumes. The reader can see the detailed summary of the minimum and maximum volumes by direction for each gateway in **Appendix C**. Also included in **Appendix C** is the range of the variation; the day-to-day variation is expressed as a percentage of the minimum and maximum volumes from the average traffic during morning and evening peak hour and 3-hour peak period vehicle volumes.

At all gateways during the morning peak hour, the two-way day-to-day variation is less than +/- 3 percent. The combined gateways day-to-day variation during the morning peak hour is less than +/- 2 percent and

during the evening peak hour is less than +/- 6 percent. Peak period variation shows a similar pattern. A review of the peak period day-to-day variation shows that the combined gateways day-to-day variation during the morning peak period is less than +/- 3 percent, while the combined gateways day-to-day variation during the afternoon peak period is less than +/- 4 percent. To put these observations in context, a general rule-of-thumb is that a street volume can vary by +/- 10 percent from one day to the next. The fact that the observed variation for all gateways is lower than this rule of thumb is some indication that the vehicle volumes may be close to capacity.

Vehicle Traffic Patterns by Time of Day

Figure 7 displays the inbound, outbound and total vehicular volumes throughout the day for all gateways combined.

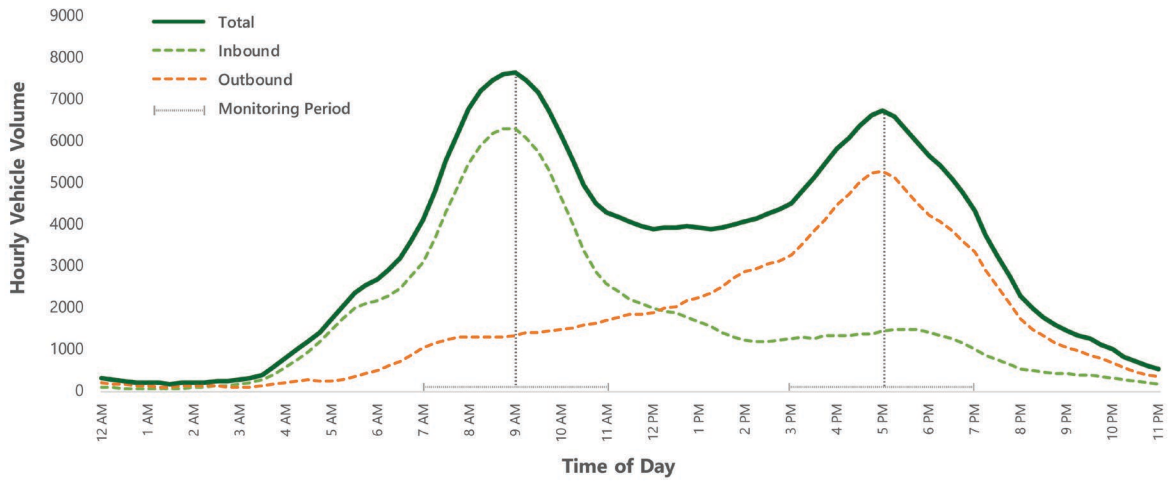


Figure 7: Existing Vehicle Traffic Patterns by Time of Day for All Gateways Combined

The primary directional flow of vehicle traffic is inbound during the morning 3-hour peak period (8:00 AM to 11:00 AM) and outbound during the evening peak period (4:00 PM to 7:00 PM). Considering both directions of travel combined, the morning peak hour starts at 9:00 AM while the evening peak hour starts at 5:00 PM. Inbound traffic peaks at 9:00 AM and the 3-hour peak period occurs from 8:00 AM to 11:00 AM. During the mid-day period from 11:00 AM to 3:00 PM, the two-way total traffic is relatively balanced directionally.

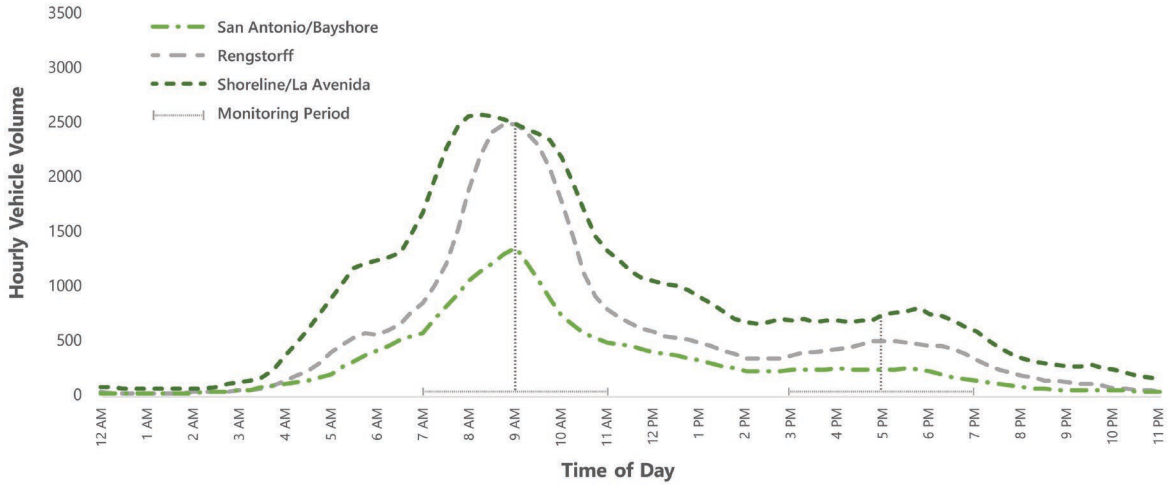


Figure 8: Existing Inbound Vehicle Traffic Patterns by Time of Day for Each Gateway

Figure 8 above presents only inbound usage at each of the three gateways. Shoreline Boulevard has a relatively flat profile during a portion (7:30 AM to 10:00 AM) of the morning peak period which decreases slightly until 10:00 AM, while Rengstorff Avenue and San Antonio Road have a more distinctly peaked pattern with a more defined peak hour (9:00 AM to 10:00 AM).

This illustrates that the traffic volumes at the Shoreline Boulevard Gateway reach its capacity at about 7:30 AM, and continue to operate at approximately that capacity until around 10:00 AM. The other gateways do not exhibit this kind of plateau, suggesting that those gateways do not reach their capacities. As shown on **Figure 8**, Rengstorff Avenue Gateway has slightly lower morning inbound peak hour volume than Shoreline Boulevard.

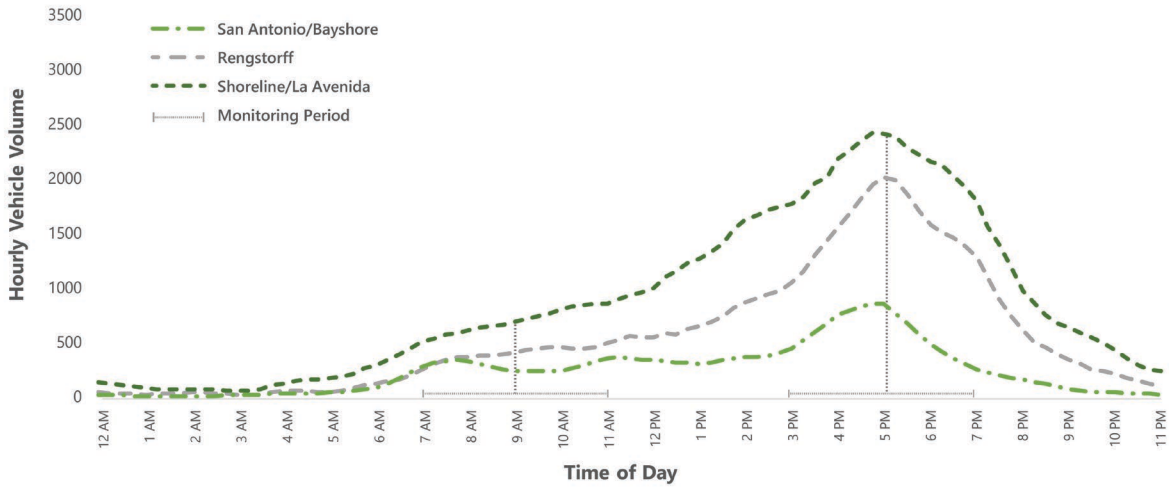


Figure 9: Existing Outbound Vehicle Traffic Patterns by Time of Day for Each Gateway

Outbound traffic is shown in **Figure 9**. The afternoon peaks are relatively broad for all three gateways, indicating that the traffic is spread somewhat more evenly across several hours than in the morning, when it is more concentrated in a shorter period of time.

Figure 10 presents total two-way daily vehicle traffic usage of each gateway. Shoreline Boulevard always serves the highest traffic volumes through all hours of the day, followed by Rengstorff Avenue and then San Antonio Road. **Appendix C** includes inbound, outbound and total vehicle volume data for all gateways.

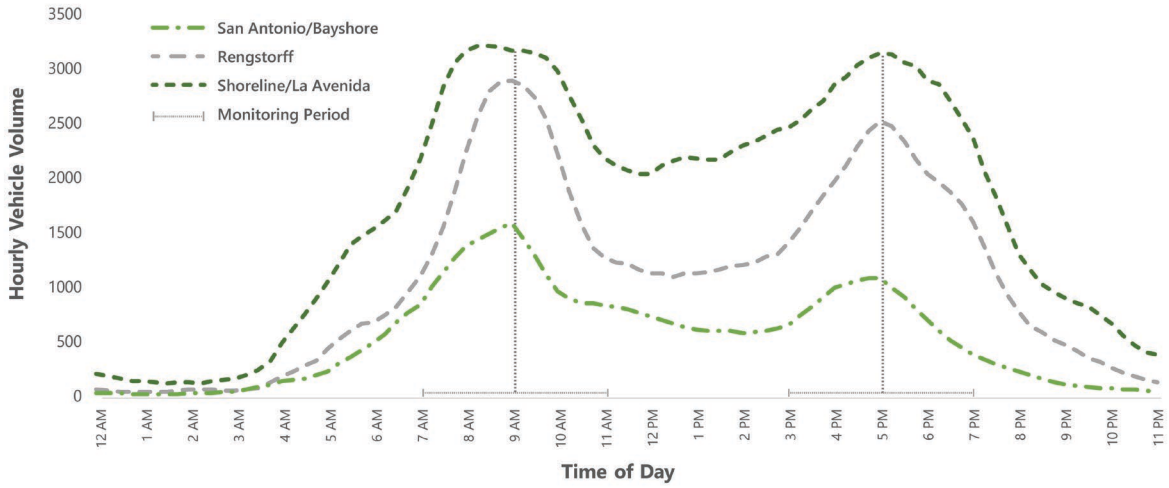
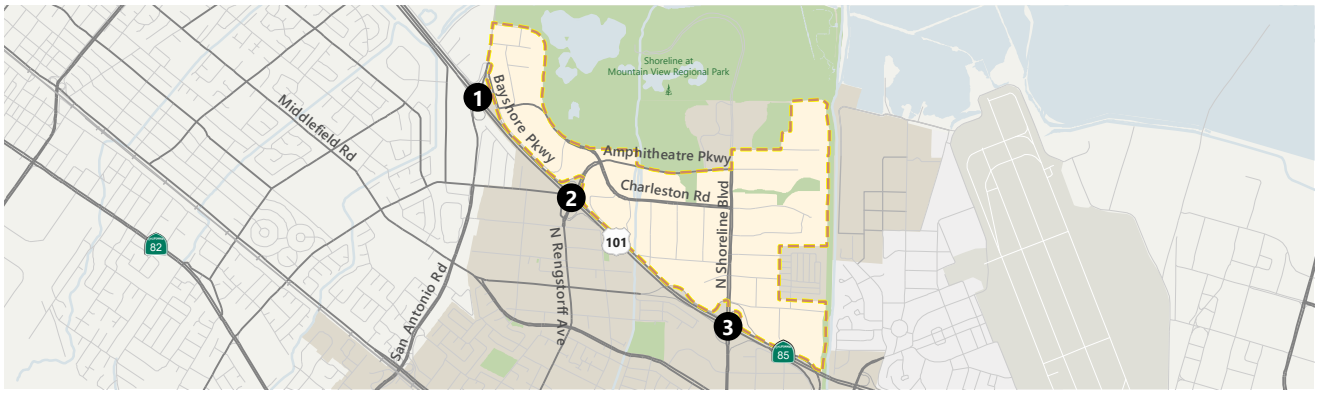
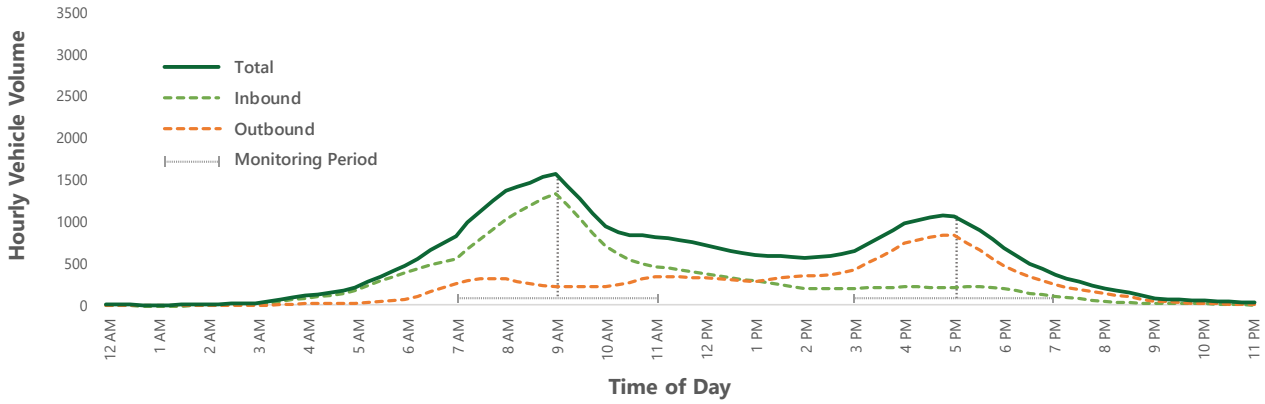


Figure 10: Existing Inbound and Outbound Vehicle Traffic Patterns by Time of Day for Each Gateway

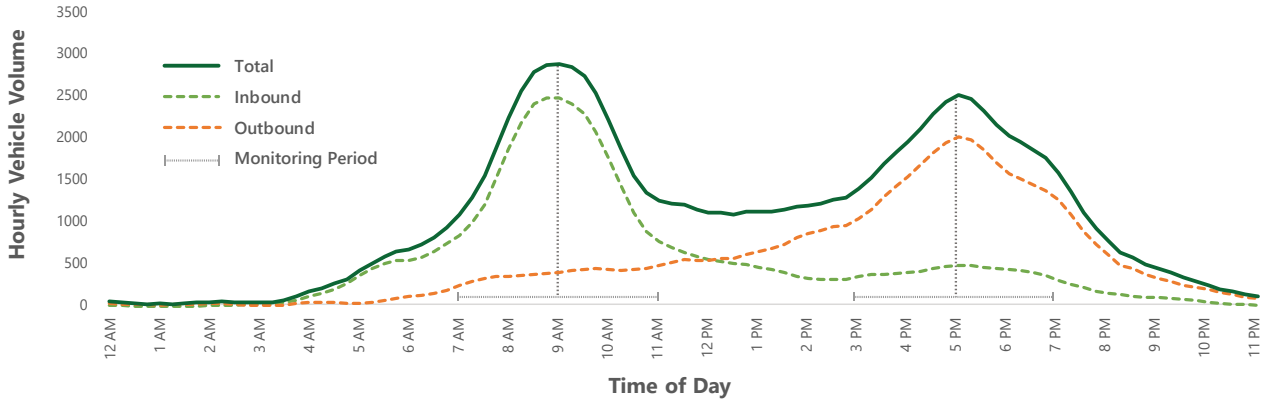
Similar information for each gateway individually is shown in **Figure 11**. As described previously, San Antonio Road is the most lightly used of the three gateways. Shoreline Boulevard and Rengstorff Avenue have similar peak traffic usage during the morning, although Shoreline carries more total vehicles because the heavy usage is spread over a longer time period. In the afternoon, Shoreline carries the most vehicles; in part, this is because there is more inbound traffic using Shoreline in the afternoon than at the other two gateways.



1 San Antonio Road Gateway



2 Rengstorff Avenue Gateway



3 Shoreline Boulevard/La Avenida Avenue Gateway

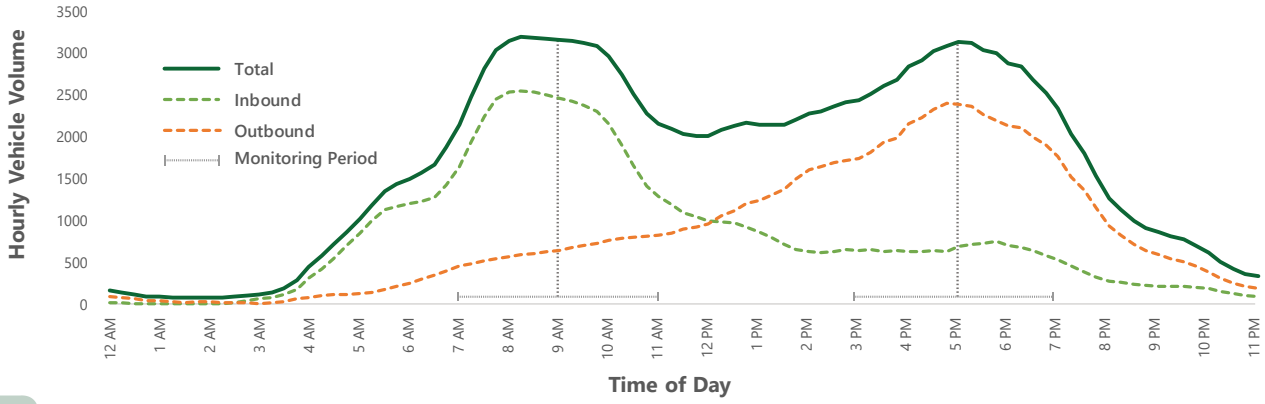


Figure 11

Gateway Inbound and Outbound Vehicle Traffic Patterns by Time of Day

Mode Share

To get to and from the North Bayshore area, people can choose to drive alone, carpool, take transit, bike, or walk. To enhance non-drive-alone choices, employers in North Bayshore have been using transportation demand management (TDM) programs that offer transit passes, employee shuttles, active transportation (bicycling and walking) incentives, carpool/vanpool incentives, and other methods to reduce daily commute stress on their employees and to reduce the number of single-occupant vehicle (SOV) trips. The City has set a person mode share target of no more than 45% SOV (of all person trips) usage at the North Bayshore gateways. Below is a summary of the mode share for travel across all gateways combined and at each individual gateway. The focus of this presentation is the peak direction of travel – inbound in the morning and outbound in the evening – since those are the trips that are most affected by TDM programs and that contribute most to the gateway volumes.

Peak Hour Mode Share

This section describes the vehicle and person mode share for all gateways combined and each gateway separately, for the morning peak hour (9:00 AM to 10:00 AM) and the evening peak hour (5:00 to 6:00 PM). Tables with data for **Figures 12-20** are included in **Appendix C**[3] and **Appendix D**. The figures in this section include mode share for persons and vehicles with and without Transportation Network Company (TNC) drivers. **Figures 12** and **14** express the mode share with the Transportation Network Company (TNC) drivers included, to allow the comparison to historical mode share observations. The emergence of TNC vehicles has revealed an alternative accounting of vehicle occupancy that excludes TNC drivers from the vehicle occupancy observations because they are providing a service and are not part of the traveling public with an origin or destination in North Bayshore. **Figures 13** and **15** to **20** express the mode share excluding the TNC drivers to express the North Bayshore person volume without these drivers.

[3] **Appendix C** includes mode share tables for persons and vehicles without and with Transportation Network Company (TNC) (e.g., Uber, Lyft, etc.) drivers.

***All Gateways Combined*[4]**

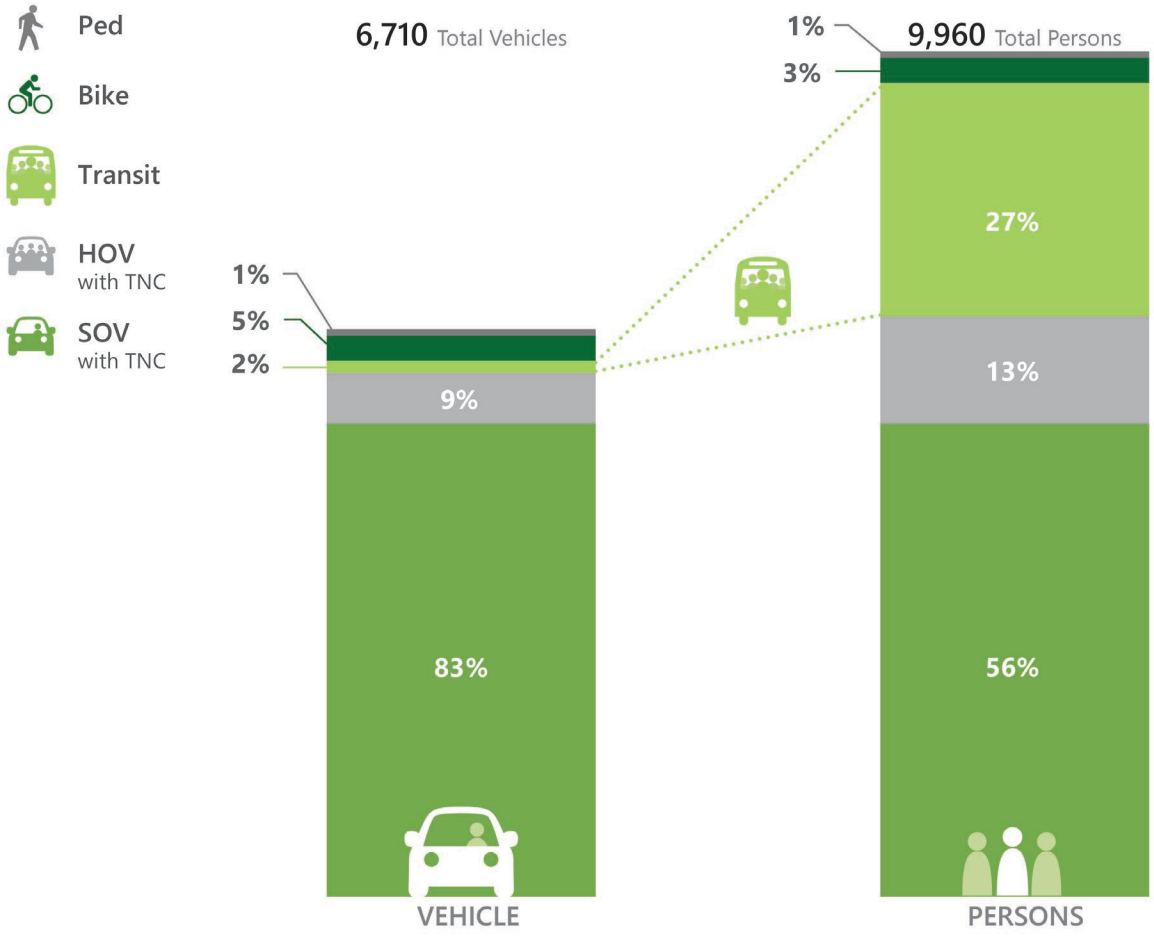


Figure 12: Existing Morning Inbound Peak Hour Mode Share for Vehicles and Persons (with TNC Drivers)

[4] Transportation network companies (TNC) (e.g., Uber, Lyft, etc.) were observed by vehicle occupancy (1 person, 2 persons, 3 persons, and 4+persons). The driver was not considered a part of the person volume: TNC0 = 0 persons per vehicle; TNC1 = 1 person per vehicle excluding driver; TNC2 = 2 persons per vehicle excluding driver; and TNC3 = 3 persons per vehicle excluding driver. Detailed TNC vehicle occupancy counts are provided in Appendix C.

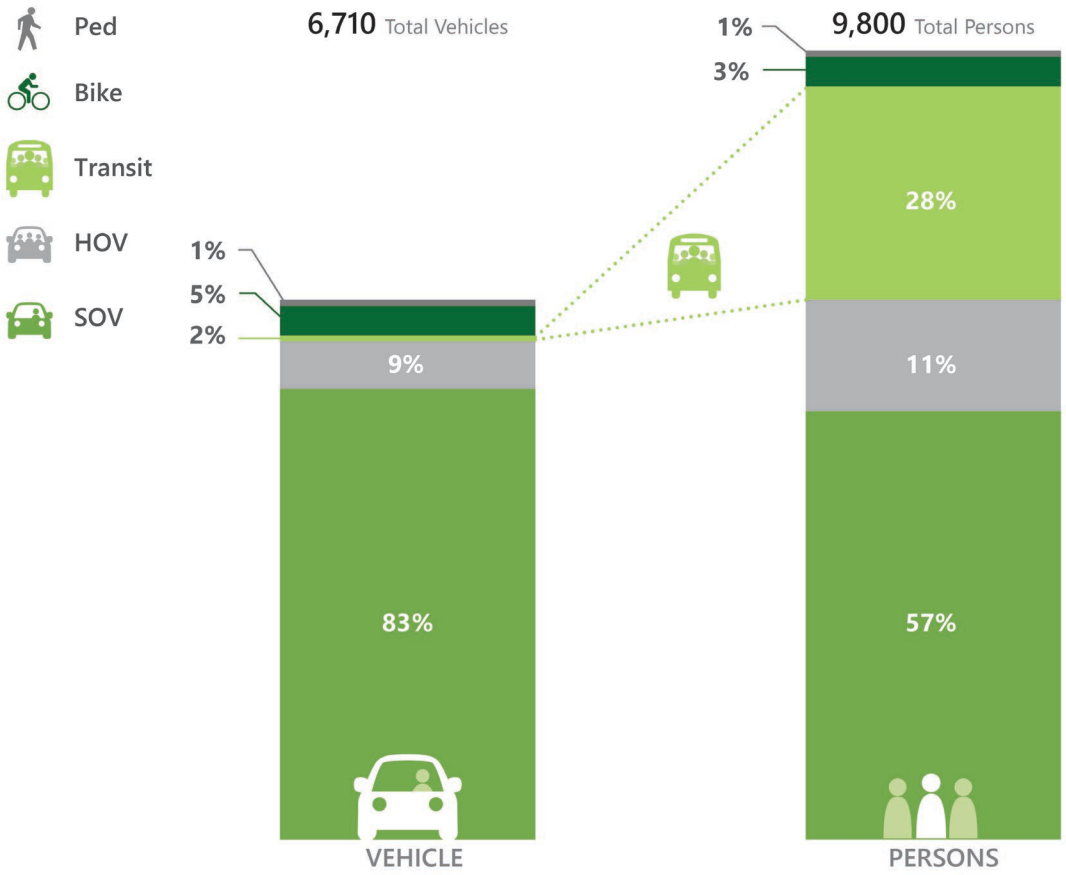


Figure 13: Existing Morning Inbound Peak Hour Mode Share for Vehicles and Persons (excludes TNC Drivers)

As shown on **Figure 12**, most vehicles (83%) entering North Bayshore during the morning peak hour are SOVs; these vehicles transport 56% of people who enter the area. An additional 13% of people arrive using carpools. 27% of commuters use public transit and shuttles, which make up only 2% of the total number of vehicles entering the area, 3% of commuters bike, and 1% walk. **Figure 13** shows the mode share excluding the TNC drivers.[5] Given the small number of TNC vehicles (165 morning peak hour and 69 evening peak hour TNC vehicles), the mode share estimates are approximately similar though the person volume is 69 to 165 persons less when excluding the TNC drivers.

[5] Transportation network companies (TNC) (e.g., Uber, Lyft, etc.) were observed by vehicle occupancy (1 person, 2 persons, 3 persons, and 4+persons). The driver was not considered a part of the person volume: TNC0 = 0 persons per vehicle excluding driver; TNC1 = 1 person per vehicle excluding driver; TNC2 = 2 persons per vehicle excluding driver; and TNC3 = 3 persons per vehicle excluding driver. Detailed TNC vehicle occupancy counts are provided in Appendix C.

As shown on **Figure 14** the evening outbound direction of travel has similar mode share characteristics as the morning inbound direction. The total number of vehicles and people is lower than the morning peak hour; as described in the previous section, evening travel is less concentrated than morning travel and is spread over a longer time period. The share of travel using each mode is similar between the morning and evening, with the primary difference being that during the evening peak hour, more people use HOVs and fewer people drive alone or use transit. **Figure 15** shows the mode share excluding the TNC drivers.[6] Like the morning peak hour, given the small number of TNC vehicles (2.5% of all vehicles), the mode share estimates are similar though the person volume is 60 persons less when excluding the TNC drivers.

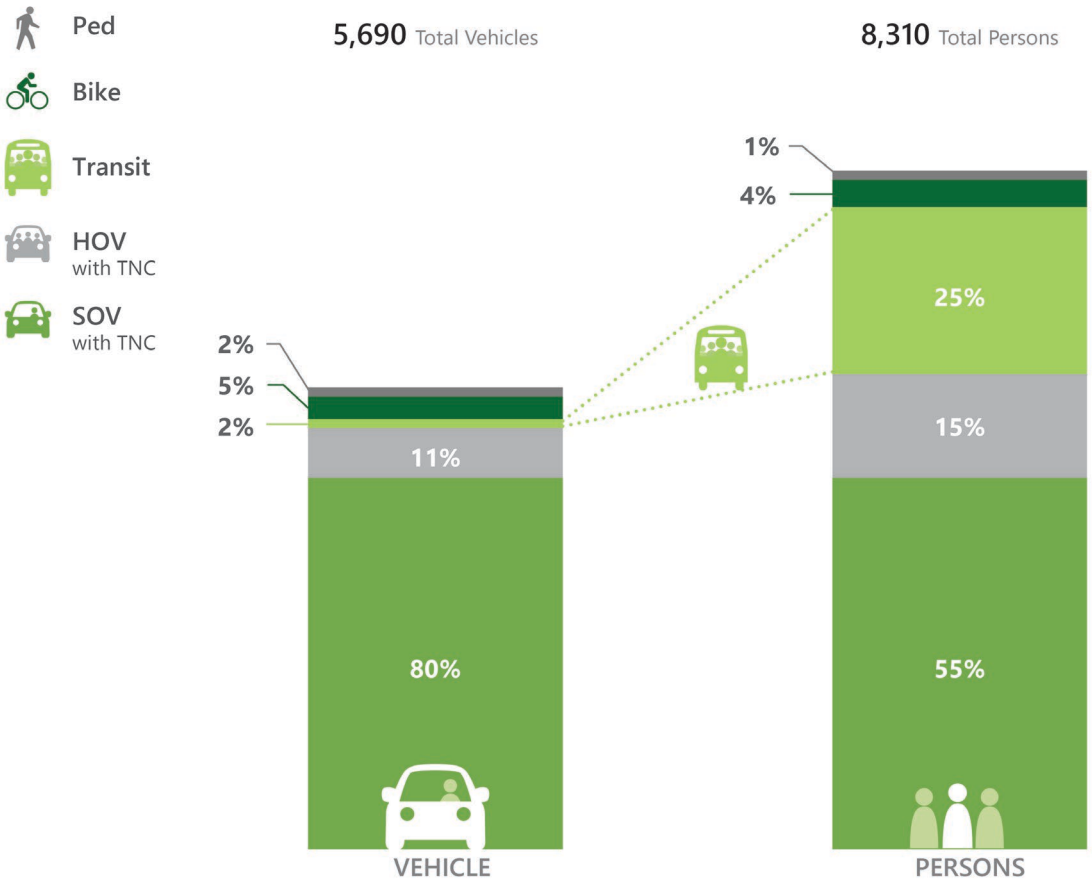


Figure 14: Existing Evening Outbound Peak Hour Mode Share for Vehicles and Persons (with TNC Drivers)

[6] Transportation network companies (TNC) (e.g., Uber, Lyft, etc.) were observed by vehicle occupancy (1 person, 2 persons, 3 persons, and 4+persons). The driver was not considered a part of the person volume: TNC1 = 0 persons per vehicle; TNC2 = 1 person per vehicle; TNC3 = 2 persons per vehicle; and TNC4 = 3 persons per vehicle. Detailed TNC vehicle occupancy counts are provided in Appendix C.

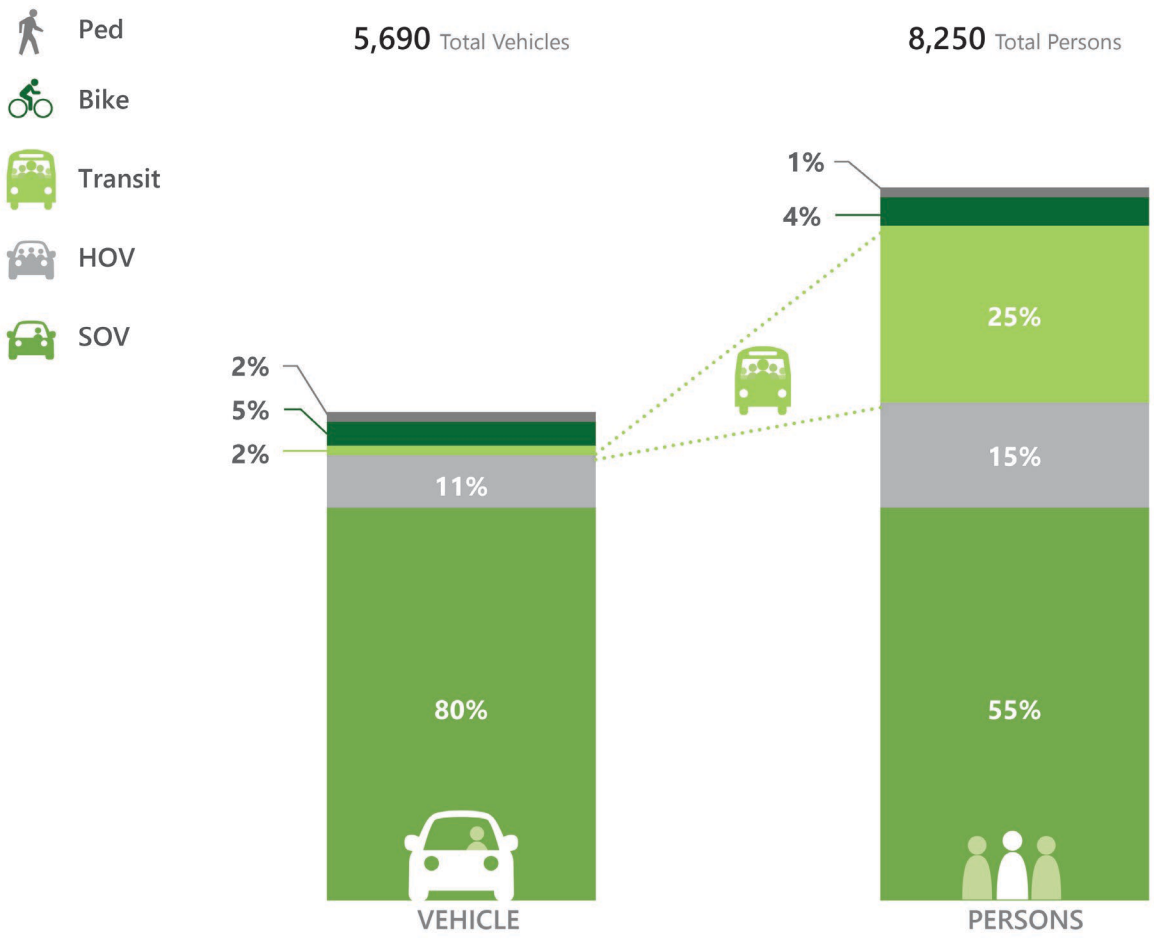


Figure 15: Existing Evening Outbound Peak Hour Mode Share for Vehicles and Persons (Excludes TNC Drivers)

By Gateway

Each gateway has a different mix of users during the morning peak hour. **Figure 16** shows the proportion of total inbound commuters who use each gateway (denoted as San Antonio Road (SA), Rengstorff Avenue (RS), Permanente Creek Trail (PC), Shoreline Boulevard (SL), and Stevens Creek Trail (SC)). Rengstorff Avenue serves the highest number of people during the morning peak hour, because many more buses use Rengstorff than use Shoreline (see below for more details).

Figure 16: Existing Inbound Morning Peak Hour Persons by Gateway (Excludes TNC Drivers)

Figure 17 presents the distribution of persons using each mode to enter each gateway during the morning peak hour. Each quadrant represents a mode of transportation (single occupancy vehicles – SOV, walking and biking - Active, transit, and carpools or high occupancy vehicles – HOV[7]). Within each quadrant, the portion of inbound person trips is ranked from highest to lowest (each quadrant captures 100 percent of the morning inbound person trips for that mode). For example, the top-left quadrant represents the SOV mode; of all persons entering North Bayshore using SOVs, Shoreline carries 42% of them while Rengstorff Avenue carries 38%.

[7] Mode share summary excludes TNC drivers.

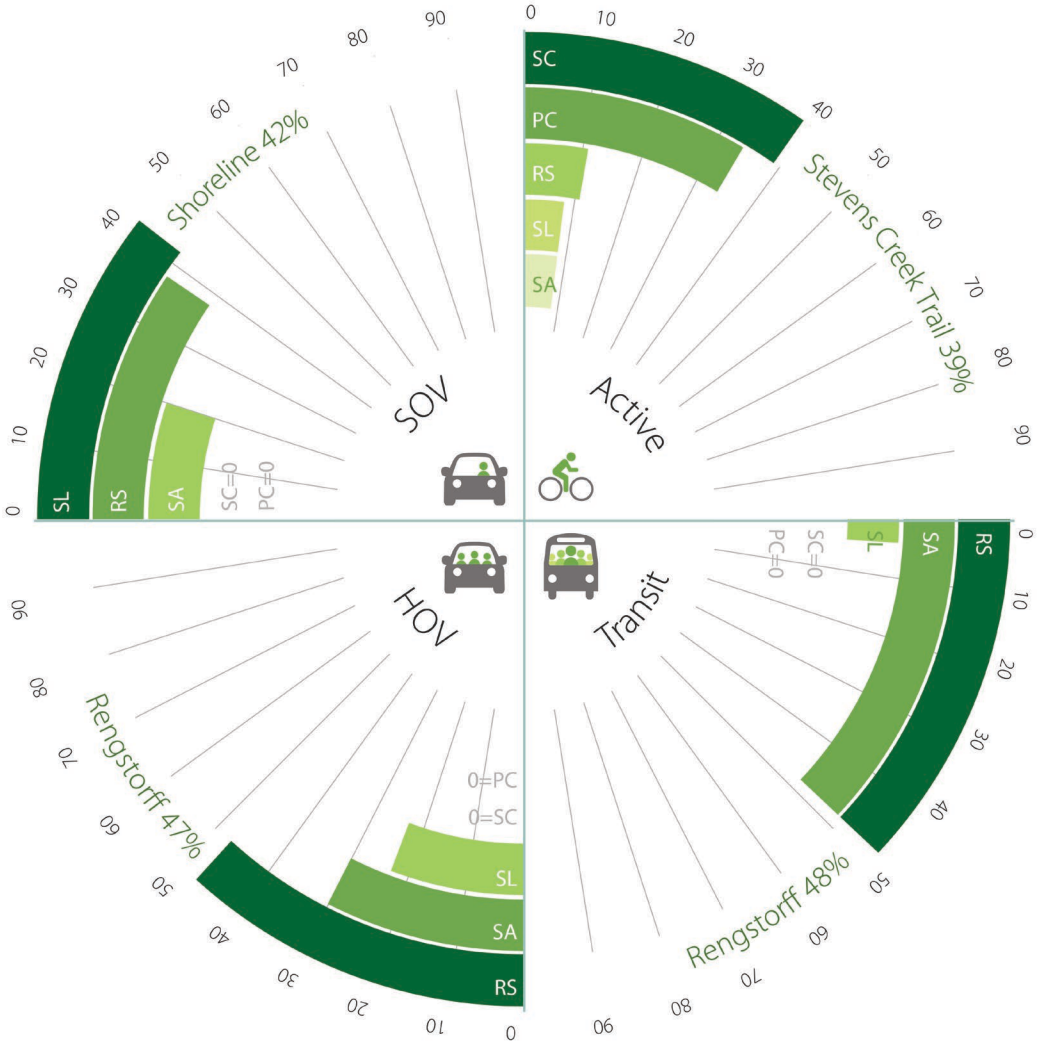


Figure 17: Existing Portion of Inbound Morning Peak Hour Persons by Gateway (Excludes TNC Drivers)

Most active mode users (73%) enter North Bayshore via one of the two major trails. Most of the transit riders enter North Bayshore via Rengstorff Avenue or San Antonio Road; together those two gateways carry 96% of inbound transit riders, while Shoreline Boulevard carries 4%. Many private shuttles approach North Bayshore from the north and use San Antonio Road or Rengstorff Avenue to enter the area; the shuttles then travel from west to east through the area dropping off passengers along the way.

Figure 18 shows the proportion of total outbound commuters who use each gateway during the evening peak hour. Shoreline Boulevard and Rengstorff Avenue carry approximately similar numbers of exiting travelers, with fewer people using San Antonio Road.

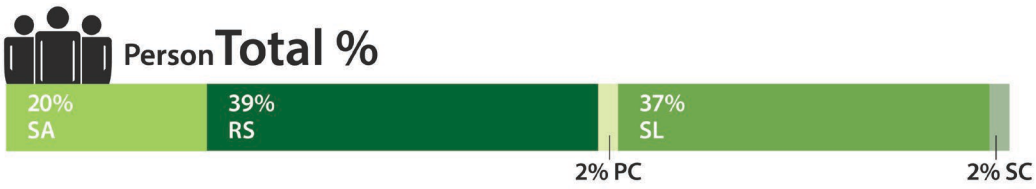


Figure 18: Existing Outbound Evening Peak Hour Persons by Gateway (Excludes TNC Drivers)

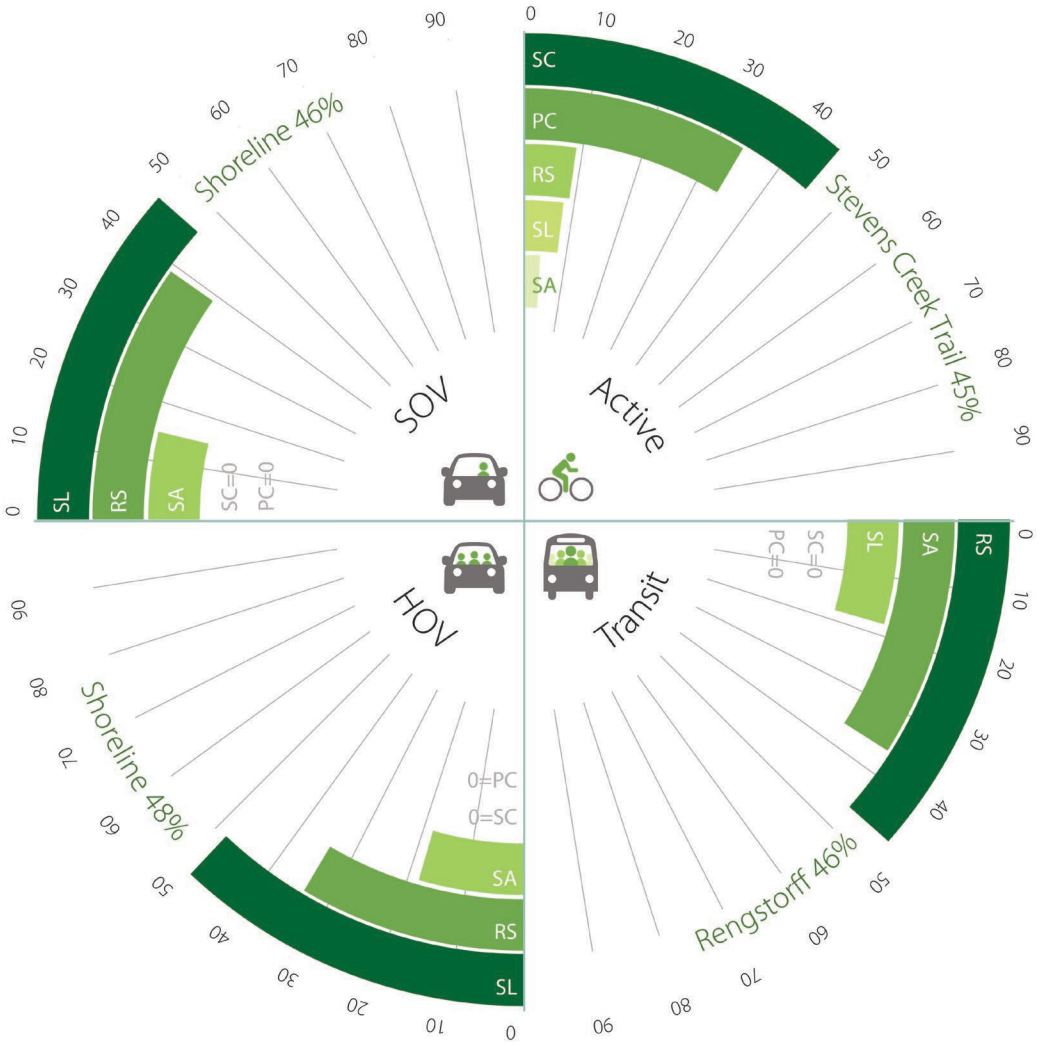


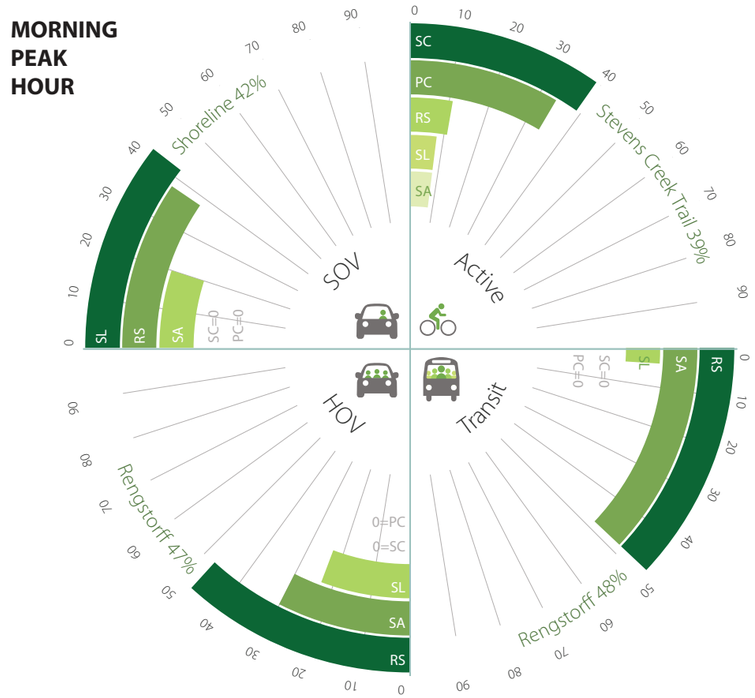
Figure 19: Existing Portion of Outbound Evening Peak Hour Persons by Gateway (Excludes TNC Drivers)

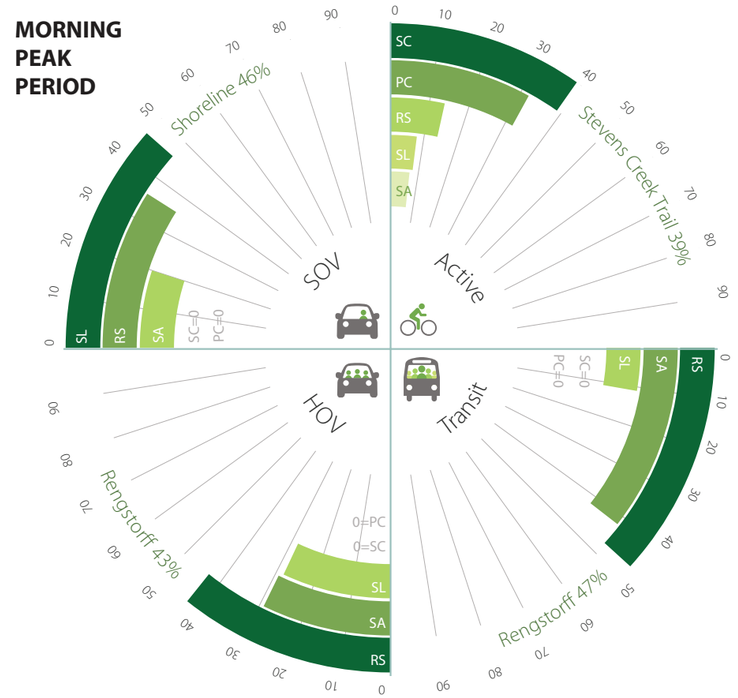
During the evening peak hour, the modal patterns of usage are relatively similar to the morning. The biggest difference is that in the evening, Shoreline Boulevard carries more HOV persons than Rengstorff Avenue.

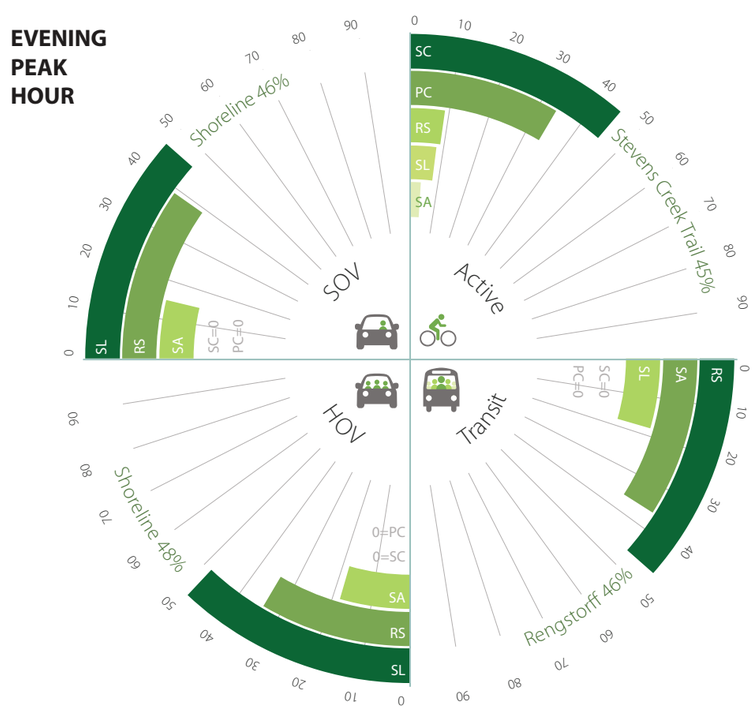
Most of the transit riders exit via Rengstorff Avenue or San Antonio Road; together those two gateways carry 82% of outbound transit riders, while Shoreline Boulevard carries 18%.

3-Hour Peak Period Mode Share

The same type of mode share analysis was conducted for the morning and evening 3-hour peak period. For informational purposes, **Figure 20** below presents the morning and evening 3-hour peak period mode split information adjacent to the peak hour mode split information.







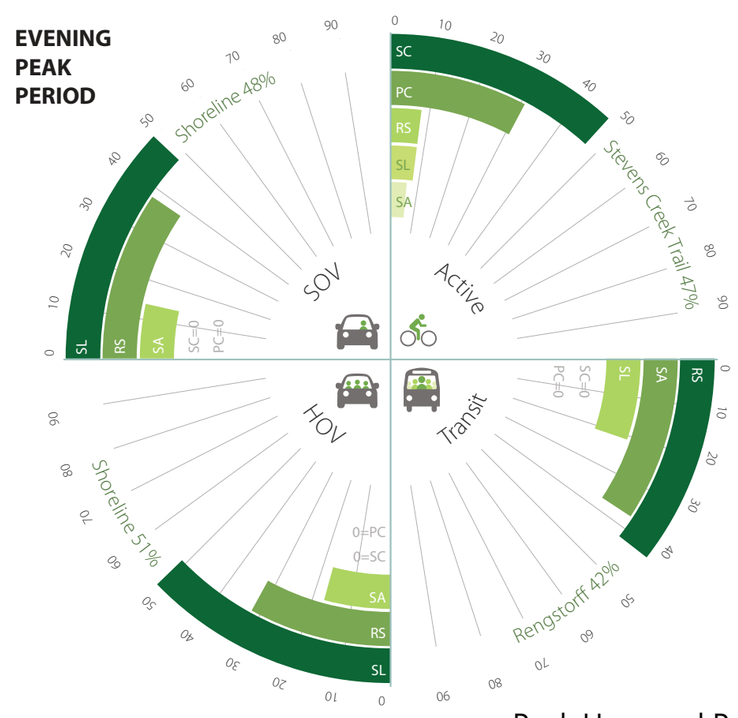


Figure 20

Peak Hour and Peak Period Persons By Gateway

N:\Projects_SJ19_Projects\SJ19_1963_NBS_Monitoring_Fall2019_Spring2020\Graphics\ADOBE\SJ19_1963_Fig20_Peak Hour and Peak Period Persons By Gateway.ai

Traffic Trends Over Time

This section presents the gateway volumes and mode shares in prior monitoring reports, combined with this year's results, to present trends over time. This comparison focuses on morning inbound traffic, since that has historically created the greatest congestion. As more data is collected, future comparisons will include both inbound and outbound traffic for both the morning and evening 3-hour peak periods. Data tables for **Figures 21** to **25** of this section are included in **Appendix C** and **Appendix D.**

Historical Volume Comparison

Since previous monitoring efforts focused on the morning inbound traffic, **Figures 21** and **22** below present inbound volume data for the morning peak hour and 3-hour peak period.

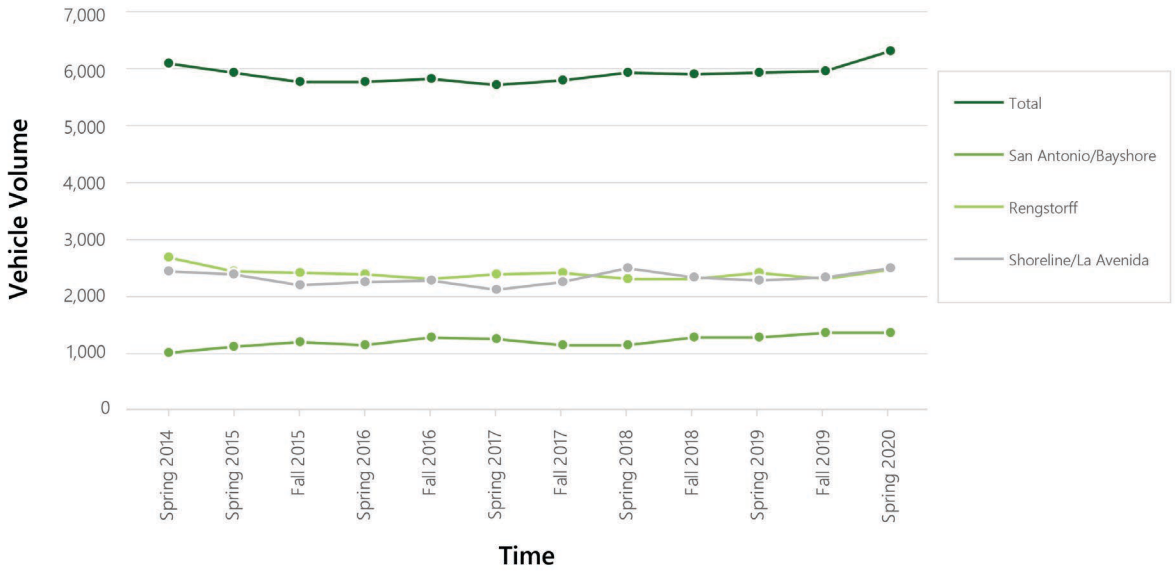


Figure 21: Morning Peak Hour Inbound Vehicle Volumes Over Time

As shown on **Figure 21**, the morning peak hour inbound vehicle volume has increased by 6% compared to Fall 2019, resulting in the highest observed total inbound vehicle volume since Spring 2014. With slight variations, peak hour volumes at each gateway have been relatively consistent over the past six years. At this round of monitoring, Shoreline Boulevard gateway inbound vehicle volume reached the highest levels observed, similar to the observed inbound vehicle volume during Spring 2018. Rengstorff Avenue gateway inbound vehicle volume increased by 5% compared to Fall 2019. In this monitoring cycle, Rengstorff Avenue gateway carries similar number of vehicles as Shoreline Boulevard gateway.

Figure 22 illustrates 3-hour peak period inbound vehicle volume over time. As shown in **Figure 22**, there has been a consistent increase in total inbound 3-hour peak period volumes since Fall 2017, with the most change occurring at Rengstorff Avenue and Shoreline Boulevard. Volumes on San Antonio Road have remained relatively flat over the past few monitoring cycles.

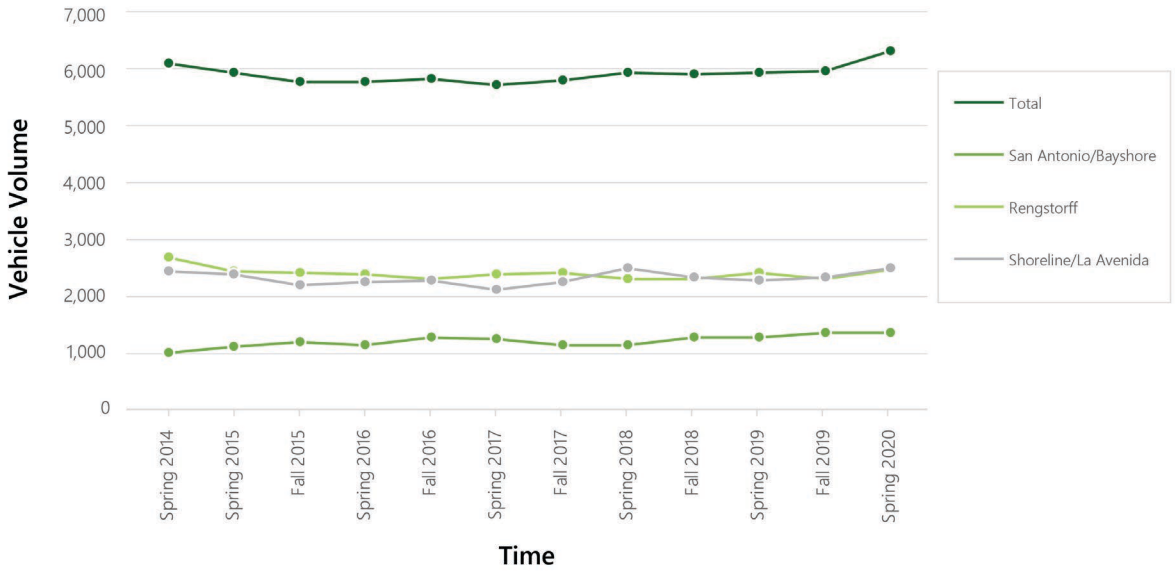


Figure 22: Morning 3-Hour Peak Period Inbound Vehicle Volumes Over Time

It should be noted that in prior monitoring reports from Spring 2014 through Spring 2017, the 3-hour peak period was defined as 7:00 to 10:00 AM (historical 3-hour peak period definition). Since Fall 2017, the vehicle classification and bus occupancy observation data has been collected over a 4-hour period from 7:00 to 11:00 AM and the highest three hours during that period have been summarized (current 3-hour peak period definition). As it is shown in **Figure 22**, the current 3-hour peak period vehicle volumes have been greater than the 7:00 AM to 10:00 AM period historical 3-hour peak period definition. For example, in Spring 2020, the current 3-hour peak period volume is 11% greater than the volume reported during the historical 3-hour peak period from 7:00 to 10:00 AM.

Historical Mode Share Comparison

As described above, previous monitoring efforts focused on the inbound traffic in the morning. Therefore, **Figures 23** and **24** below present mode share results for the inbound morning peak hour and 3-hour peak period.

Inbound Morning Peak Hour

Figure 23 below shows the person mode share for the morning inbound peak hour since Spring 2014. Compared to the initial Spring 2014 results, the current results indicate higher SOV mode share (57% compared to the initial 51%) and lower HOV mode share (28% compared to the initial 33%). Compared to the most recent observations in Fall 2019, the SOV mode share has increased from 50% to 57%. Beginning with the Spring 2019 report, transportation network companies (TNC) (e.g., Uber, Lyft, etc.) have been separately noted and categorized by vehicle occupancy (1 person, 2 persons, 3 persons, and 4+persons). One-person (i.e., driver only) TNC vehicles were included as single occupancy vehicles (SOV), while TNC vehicles with two or more persons were included as high occupancy vehicles (HOV). This accounting of the TNCs is used to match the vehicle occupancy observations prior to the Fall of 2018. The percent mode split for each year is described in **Appendix C**.

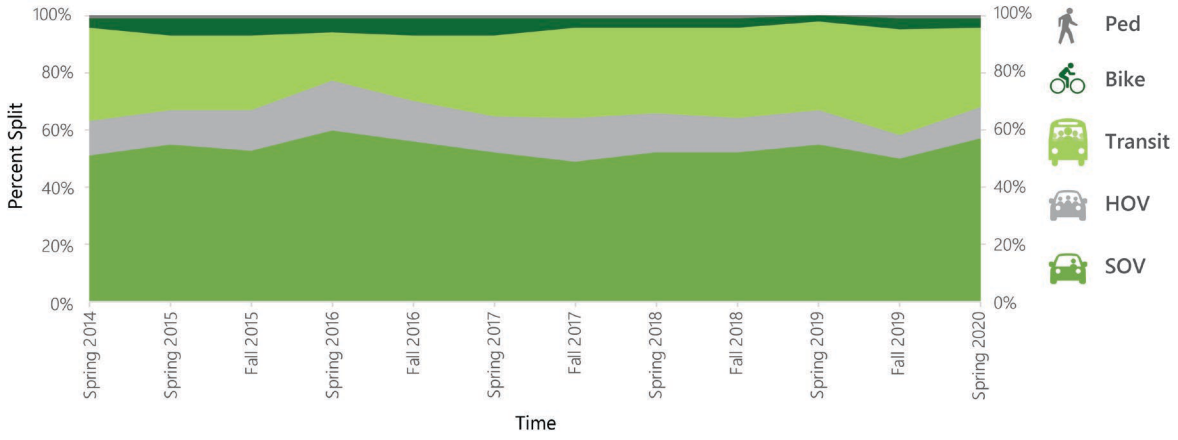


Figure 23: Inbound Morning Peak Hour Person Mode Split Over Time

The above graph shows that the SOV mode share has been the dominant mode share with some fluctuation. Since the Spring 2014, the SOV mode share has increased by 6 percentage points while the HOV is 5 percentage points. To illustrate the change mode share in a different way, the same data was separated by the Spring observations (**Figure 24**) and Fall observations (**Figure 25**) mode share data. The peak hour mode shares of each mode fluctuate over time with SOV being the greatest portion of the mode share followed by transit and HOV modes.

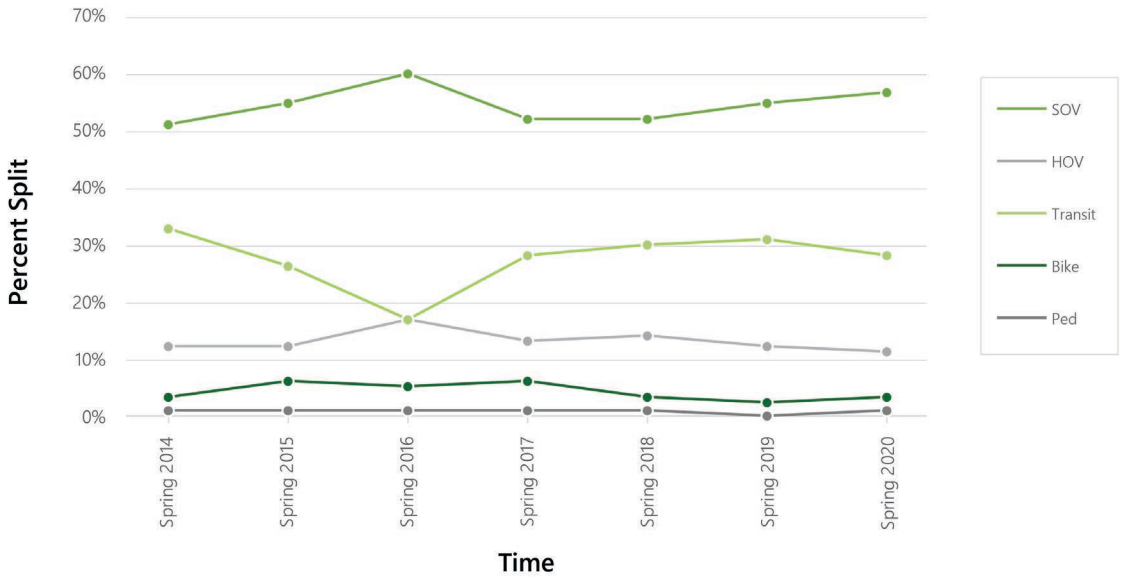


Figure 24: Inbound Morning Peak Hour Person Mode Split Over Time (Spring Observations)

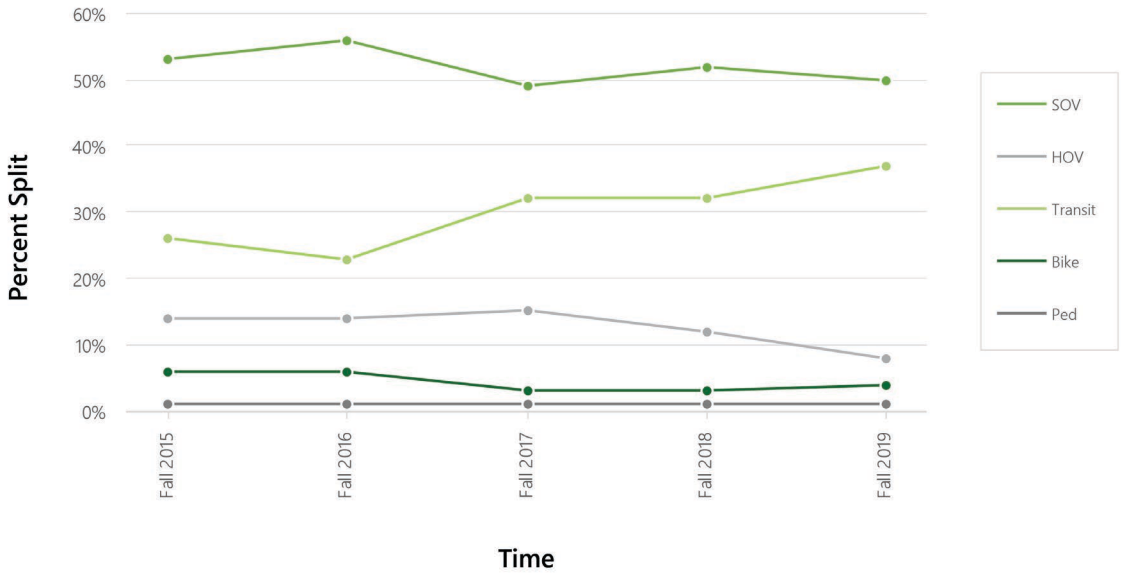


Figure 25: Inbound Morning Peak Hour Person Mode Split Over Time (Fall Observations)

Inbound Morning 3-Hour Peak Period

Figure 26 below shows the person mode share for the morning inbound 3-hour peak period (7:00 to 10:00 AM) since Spring 2014. Over this time period, the mode shares have remained quite similar; transit has

remained consistent at 25%, SOV has increased slightly from 58% to 60% and HOV has declined by a similar amount. The percent mode split for each year is described in **Appendix C**.

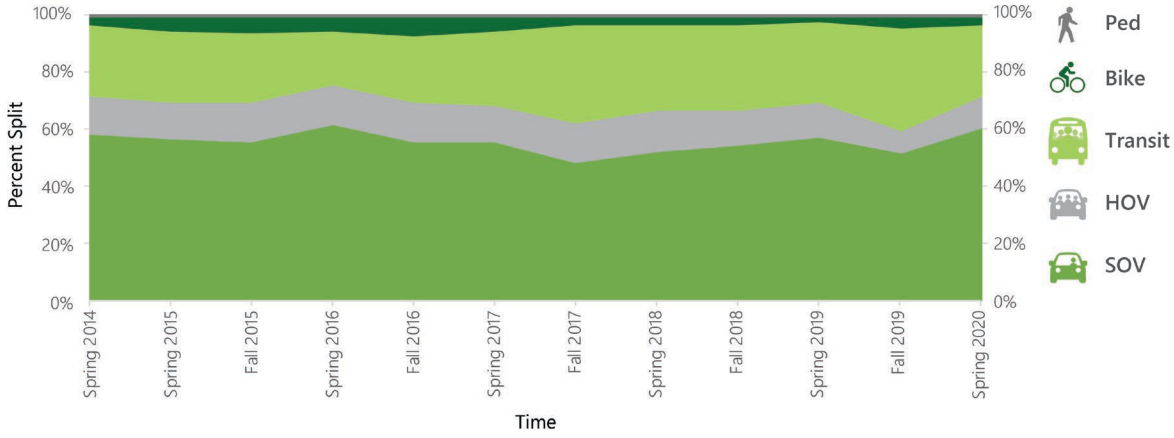


Figure 26: Inbound Morning 3-Hour Peak Period Person Mode Split Over Time

As mentioned before, since Fall 2017, data has been collected over a 4-hour period from 7:00 AM to 11:00 AM, and it was determined that the highest three hours of traffic occurred between 8:00 AM and 11:00 AM. **Figure 27** shows the mode split historical trend from 8:00 AM to 11:00 AM for Fall 2017, Spring 2018, Fall 2018, Spring 2019, Fall 2019, and Spring 2020.

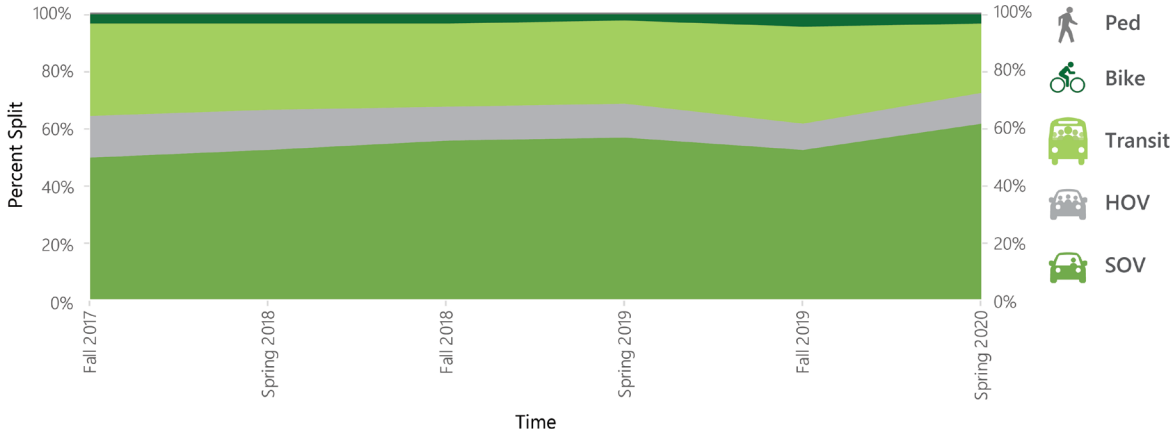


Figure 27: Inbound Morning 3-Hour Peak Period Person Mode Split Over Time (Based on 4-hour Observation)

The above graphs show similar mode share trends as the peak hours – SOV is the dominant mode and the SOV model share has increased from Spring 2014 to Spring 2020. that the mode share has shown an increase in the peak period by 2 percentage points while the HOV has decreased by 2 percentage points. To illustrate the change mode share in a different way, the same data was separated by the Spring observations (**Figure 28**) and Fall observations (**Figure 29**) mode share data. The peak period mode shares

of each mode fluctuate over time with SOV being the greatest portion of the mode share followed by transit and HOV modes. The 3-hour peak period (between the 4 hours of observations) mode shares of each mode show the SOV percentage in Spring 2020 is greater than the Spring 2018 since peak period observations were expanded to 4 hours in the morning and evening.

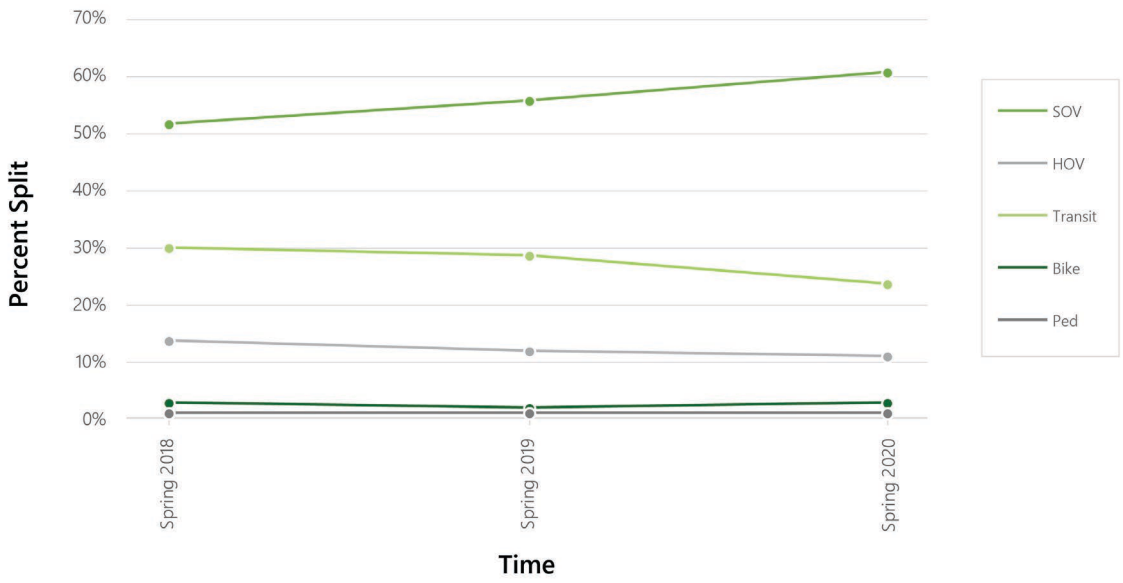


Figure 28: Inbound Morning 3-Hour Peak Period Person Mode Split Over Time (Spring Observations)

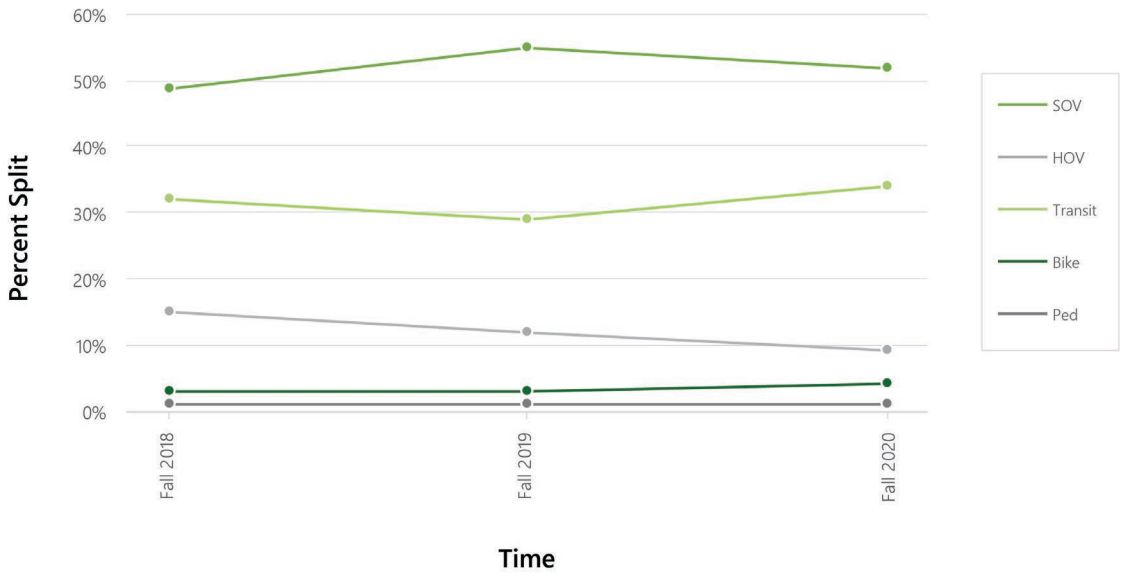


Figure 29: Inbound Morning 3-Hour Peak Period Person Mode Split Over Time (Fall Observations)

Gateway Queuing Observations

As part of the monitoring effort, vehicle queues were recorded using cameras at the inbound and outbound approaches of the Rengstorff Avenue and Shoreline Boulevard gateways. Vehicle queues increase under conditions where gateway traffic exceeds capacity. Noting the extent of the queues and times at which the queues begin to increase and decrease in size can help in understanding the North Bayshore Gateway operations throughout the morning and evening peak periods.

Figure 30 displays the approximate queue lengths and their location at these gateways. **Table 3** presents the times at which queues begin to form and estimates of the maximum queue lengths in one lane for Spring 2019 and Spring 2018.

This data confirms that Shoreline Boulevard experiences the longest-lasting queues, extending for three or more hours in the morning and in the evening. Compared to Spring 2019 monitoring results, the northbound queue lengths on Shoreline Boulevard have increased during the morning peak period, as the inbound AM vehicle volume at this gateway has increased by 10% since last monitored in Spring 2019. During the morning inbound peak period, the estimated maximum queue length on northbound Shoreline Boulevard is about 1,900 feet (450 feet more compared to Spring 2019). Unlike northbound direction, the queue length on southbound Shoreline Boulevard during the evening peak period has decreased by 4-5 vehicles since Spring 2019.

Queues around the Rengstorff Avenue Gateway lasted less than two hours in the morning, and in the evening extended for over two hours. Queue lengths vary depending on location and available storage. Compared to Spring 2019 monitoring, the evening queue lengths on eastbound Garcia Avenue have grown from 1,230 feet to 1,300 feet and from 1,000 feet to 1,100 feet on westbound Charleston Road. However, the queue length has decreased from 760 feet on southbound Amphitheatre Parkway to 600 feet.

Morning inbound queues on US-101 Northbound Off-Ramps extended to the US-101 mainline and in the case of the Shoreline Boulevard Off-Ramps, queues extended to the SR-85 Off-Ramps as well.

Table 3: Inbound and Outbound Queuing Observation Summary

Gateway	Queue Location[1]	Spring 2020			Spring 2019		
		Start Time of Queue Formation	Start Time of Queue Dissipation	Maximum Queue Length Estimate[2]	Start Time of Queue Formation	Start Time of Queue Dissipation	Maximum Queue Length Estimate[2]
Morning Inbound Direction							
Rengstorff Avenue	Northbound on Rengstorff Avenue (bridge over US-101)	8:40 AM	10:30 AM	1,100 feet* (44 vehicles)	8:30 AM	10:00 AM	1,200 feet* (48 vehicles)
	NB US-101 Off-Ramp	8:40 AM	10:35 AM	1,600 feet* (64 vehicles)[4]	8:30 AM	10:20 AM	950 feet* (38 vehicles)
Shoreline Boulevard	Northbound on Shoreline Boulevard (bridge over US-101)	7:30 AM	10:20 AM	1,900 feet (76 vehicles)	7:20 AM	10:30 AM	1,450 feet (58 vehicles)
	NB US-101 Off Ramp	7:30 AM	10:40 AM	2,800 feet (112 vehicles)[4]	7:05 AM	10:45 AM	1,380 feet* (55 vehicles)
Evening Outbound Direction							
Rengstorff Avenue	Eastbound on Garcia Avenue	4:05 PM	6:30 PM	1,300 feet* (52 vehicles)	4:00 PM	6:15 PM	1,230 feet* (49 vehicles)
	Southbound on Amphitheatre Parkway	4:10 PM	6:15 PM	600 feet (24 vehicles)	4:45 PM	6:35 PM	760 feet (30 vehicles)
	Westbound on Charleston Road	4:00 PM	N/A[3]	1,100 feet (44 vehicles)	4:55 PM	5:50 PM	1,000 feet (40 vehicles)
Shoreline Boulevard	Westbound on La Avenida Street	3:00 PM	6:30 PM	400 feet (16 vehicles)	3:20 PM	7:20 PM	520 feet (21 vehicles)
	Southbound on Shoreline Boulevard	3:05 PM	N/A[3]	2,000 feet (80 vehicles)	3:00 PM	N/A[3]	2,110 feet (84 vehicles)

Notes:

1. Queue lengths measured from the stop bar at the intersection. Northbound US-101 off-ramp queue at Rengstorff Avenue measured from the merge point stop bar.
2. Queue lengths represent maximum observed queue length in one lane. Some queue length extents not visible from videos. At these locations, an asterisk (*) is placed next to the length estimate. Actual queue lengths exceed these estimates. A conversion factor of 25 feet per vehicle assumed for vehicle queue conversion. This estimate was adjusted by comparing to actual queue length observations on video recordings.
3. N/A = queues did not dissipate before the end of recordings (7:00 PM).
4. In this round of monitoring, additional cameras were installed closer to US 101 at Shoreline Boulevard and Rengstorff Avenue to better observe the queue extent backed up along US 101.

Source: Fehr & Peers, April 2020.

Figure 30

Maximum Queue in Peak Direction

Definition of Gateway Capacity

The physical vehicle capacity of the three main gateways (San Antonio Road, Rengstorff Avenue, and Shoreline Boulevard) represents the number of vehicles that can be served during the peak morning and evening periods while maintaining reasonable freedom of vehicular movement (i.e., avoiding gridlock conditions). To establish the 2014 NBPP vehicle trip targets, a traffic operations analysis was conducted (*North Bayshore Precise Plan EIR – Establishing Vehicle Gateway Capacity and Sensitivity Tests on Accommodating New Growth*, Fehr & Peers, July 2014), which assumed the full build out of the land uses envisioned in the 2014 NBPP. Because the 2017 NBPP envisioned a different set of land uses, with the inclusion of nearly 10,000 residential dwelling units, an updated gateway capacity analysis was conducted (*North Bayshore Precise Plan EIR –Vehicle Gateway Capacity with Residential*, Fehr & Peers, December 2016). Key findings of both analyses are described below, and each document is included in **Appendix E**.

2014 NBPP Gateway Capacity

With this version of the Precise Plan, the North Bayshore area traffic patterns would continue to be highly directional, with flows that are predominantly inbound in the morning and outbound in the evening. **Table 4** shows the estimated morning and evening peak hour and peak period vehicle capacities for each gateway separately and for all gateways combined.

Table 4: 2014 NBPP Gateway Capacity

Gateway	Morning			Evening		
	Inbound	Outbound	Total	Inbound	Outbound	Total
Peak Hour						
San Antonio Road	1,530	170	1,700	400	1,340	1,740
Rengstorff Avenue	2,960	330	3,290	350	2,090	2,440
Shoreline Boulevard	2,490	620	3,110	1,030	2,730	3,760
Total	**6,980**	**1,120**	**8,100**	**1,780**	**6,160**	**7,940**
3-Hour Peak Period						
San Antonio Road	4,140	460	4,600	1,100	3,620	4,720
Rengstorff Avenue	7,990	880	8,870	950	5,630	6,580
Shoreline Boulevard	6,720	1,680	8,400	2,780	7,380	10,160
Total	**18,850**	**3,020**	**21,870**	**4,830**	**16,630**	**21,460**

Note: Vehicle volumes rounded to nearest 10.
Source: Fehr & Peers, *North Bayshore Precise Plan EIR - Establishing Vehicle Gateway Capacity and Sensitivity Tests on Accommodating New Growth*, July 2014.

2017 NBPP Gateway Capacity

This version of the Precise Plan adds nearly 10,000 residential dwelling units, which has the effect of creating a somewhat more balanced directional traffic flow, increasing the amount of outbound traffic in the morning and inbound traffic in the evening. **Table 5** shows the estimated morning and evening peak hour and peak period vehicle capacities for each gateway separately and for all gateways combined.

Table 5: 2017 NBPP Gateway Capacity

Gateway	Morning			Evening		
	Inbound	Outbound	Total	Inbound	Outbound	Total
Peak Hour						
San Antonio Road	1,460	430	1,890	490	1340	1,830
Rengstorff Avenue	2,620	670	3,290	650	1,790	2,440
Shoreline Boulevard	2,220	890	3,110	1,170	2,590	3,760
Total	**6,300**	**1,990**	**8,290**	**2,310**	**5,720**	**8,030**
3-Hour Peak Period						
San Antonio Road	3,950	1,160	5,110	1,330	3,620	4,950
Rengstorff Avenue	7,070	1,810	8,880	1,760	4,830	6,590
Shoreline Boulevard	5,990	2,400	8,390	3,160	7,000	10,160
Total	**17,010**	**5,370**	**22,380**	**6,250**	**15,450**	**21,700**

Note: Vehicle volumes rounded to nearest 10.
Source: Fehr & Peers, *North Bayshore Precise Plan EIR - Vehicle Gateway Capacity with Residential*, December 2016.

Comparison

Table 6 compares the peak hour gateway capacities calculated for the 2014 NBPP and 2017 NBPP, and **Table 7** shows the same comparison for the peak period. A few key findings are:

- The total capacity is higher with the 2017 NBPP. With more balanced usage of both directions of travel, more vehicles can be accommodated in total, and specifically for the San Antonio Road gateway which has the lowest usage and therefore the most available capacity.

- The Rengstorff and Shoreline gateways show the two-way gateway capacities are unchanged and a direct trade-off between directions of travel; as more vehicles use the non-peak direction of travel under the 2017 NBPP, fewer vehicles can use the peak direction. As a result of the directional trade-off, the 2017 NBPP inbound capacity is less than the 2014 NBPP inbound capacity. This observation about the physical vehicle capacity is important when considering the use of an inbound trip target for the North Bay Shore Gateway Evaluation (see discussion of

gateway trip targets starting on page 38 for possible options of how the gateway capacities can be used as a gateway trip target to evaluate the Gateway Trip Cap Policy).

Table 6: Peak Hour Gateway Capacity Comparison

Gateway	Morning			Evening		
	Inbound	Outbound	Total	Inbound	Outbound	Total
2014 NBPP (A)						
San Antonio Road	1,530	170	1,700	400	1,340	1,740
Rengstorff Avenue	2,960	330	3,290	350	2,090	2,440
Shoreline Boulevard	2,490	620	3,110	1,030	2,730	3,760
Total	**6,980**	**1,120**	**8,100**	**1,780**	**6,160**	**7,940**
2017 NBPP (B)						
San Antonio Road	1,460	430	1,890	490	1,340	1,830
Rengstorff Avenue	2,620	670	3,290	650	1,790	2,440
Shoreline Boulevard	2,220	890	3,110	1,170	2,590	3,760
Total	**6,300**	**1,990**	**8,290**	**2,310**	**5,720**	**8,030**
Difference (B-A)						
San Antonio Road	-70	260	190	90	0	90
Rengstorff Avenue	-340	340	0	300	-300	0
Shoreline Boulevard	-270	270	0	140	-140	0
Total	**-680**	**870**	**190**	**530**	**-440**	**90**

Note: Vehicle volumes rounded to nearest 10.
Source: Fehr & Peers, 2020.

Table 7: Peak Period Gateway Capacity Comparison

Gateway	Morning			Evening		
	Inbound	Outbound	Total	Inbound	Outbound	Total
2014 NBPP (A)						
San Antonio Road	4,140	460	4,600	1,100	3,620	4,720
Rengstorff Avenue	7,990	880	8,870	950	5,630	6,580
Shoreline Boulevard	6,720	1,680	8,400	2,780	7,380	10,160
Total	**18,850**	**3,020**	**21,870**	**4,830**	**16,630**	**21,460**
2017 NBPP (B)						
San Antonio Road	3,950	1,160	5,110	1,330	3,620	4,950
Rengstorff Avenue	7,070	1,810	8,880	1,760	4,830	6,590
Shoreline Boulevard	5,990	2,400	8,390	3,160	7,000	10,160
Total	**17,010**	**5,370**	**22,380**	**6,250**	**15,450**	**21,700**
Difference (B-A)						
San Antonio Road	-190	700	510	230	0	230
Rengstorff Avenue	-920	930	10	810	-800	10
Shoreline Boulevard	-730	720	-10	380	-380	0
Total	**-1,840**	**2,350**	**510**	**1,420**	**-1,180**	**240**

Note: Vehicle volumes rounded to nearest 10.
Source: Fehr & Peers, 2020.

Gateway Trip Targets

The NBPP trip cap policy is based on the physical vehicle capacity of the North Bayshore gateways. The NBS vehicle trip targets have been set based on three key factors: time period, direction, and location.

- Time period: The most common time periods for traffic analysis are a single peak hour or a three-hour peak period. In general, a trip target set for a single peak hour will be somewhat more restrictive than one set for a peak period. In the North Bayshore area, congested conditions typically last for multiple hours in both the morning and the evening. In North Bayshore a peak hour or a peak period trip target are similar because of the duration of congestion at the gateways.

- Direction: Targets can be set for a single direction of travel, or for both directions combined. A peak direction (e.g., inbound in the morning) vehicle trip target is simple to understand; however, that trip target would need periodic adjustment as different types of land uses (namely, residential) are added to NBS, because the physical capacity of one direction of travel will change depending on

how much travel occurs in the other direction. A trip target set for both directions combined is a complete indicator of gateway capacity and no adjustment would be needed as different land use types are added to NBS.

- Location: Trip targets can be set for each gateway individually, or for combinations of two or three gateways. A target set for each gateway individually would be more restrictive than one set for a combination of locations. A combined gateway trip target would imply that the NBS gateways operate as a system, such that as one gateway reaches capacity traffic will shift to other gateways.

The 2017 NBPP contains a policy that establishes vehicle trip targets for each gateway individually, based on two-way volumes (i.e., both directions of travel combined), for the morning peak hour and the evening peak hour. By contrast, the 2014 NBPP vehicle trip target policy focused only on the inbound direction of travel during the morning 3-hour peak period, for each gateway individually (e.g., San Antonio, Rengstorff, and Shoreline). Given there are several possible trip targets, the Mountain View City Council has requested that a comparison of the gateway volumes to both the 2014 NBPP and 2017 NBPP capacity estimates be presented for inbound, outbound and total vehicle traffic during each time period.

Gateway Trip Target Evaluation

This section presents the observed two-way volumes and compares those volumes to the vehicle trip caps adopted in the 2017 NBPP. **Table 8** presents the results for the morning and evening peak hours, which is the focus of the NBPP policy. For informational purposes, **Figure 31** presents the morning and evening peak hour combined gateway results, which shows available capacity across all gateways combined. **Table 8** shows available capacity at each of the gateways (i.e., San Antonio, Rengstorff and Shoreline).

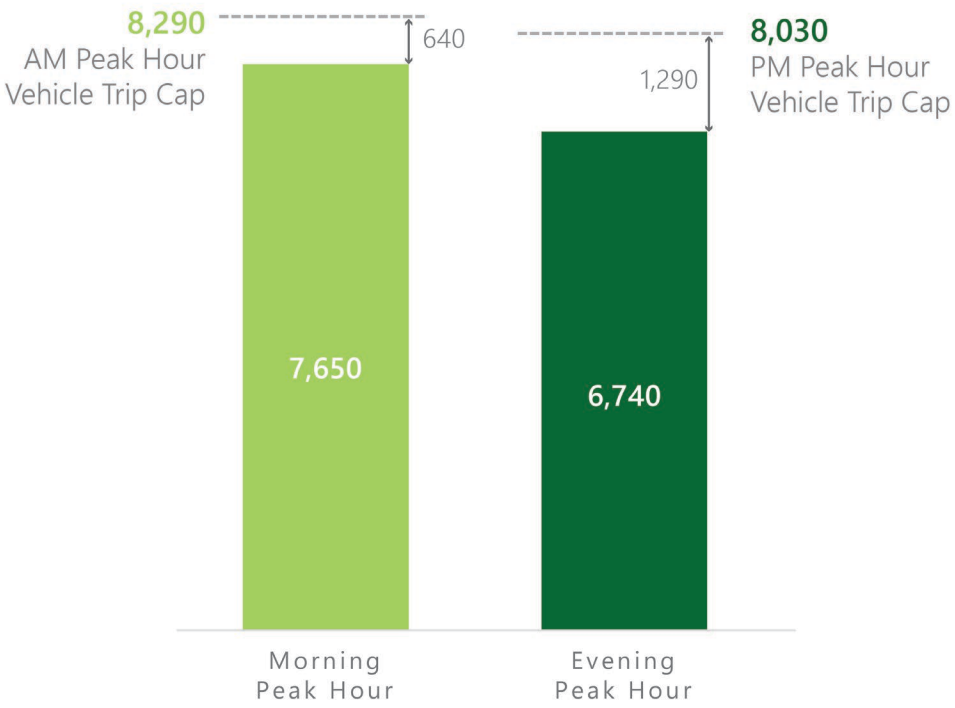


Figure 31: Two-Way Peak Hour Gateway Vehicle Trip Cap Comparison

Table 8: Gateway Trip Target Evaluation – Two-Way Peak Hour

Gateway	Morning				Evening			
	Spring 2020 Volume	Target	Remaining Gateway Capacity	Percent of Gateway Capacity Remaining	Spring 2020 Volume	Target	Remaining Gateway Capacity	Percent of Gateway Capacity Remaining
San Antonio Road	1,590	1,890	300	16%	1,080	1,830	750	41%
Rengstorff Avenue	2,890	3,290	400	12%	2,510	2,440	-70	-3%
Shoreline Boulevard	3,170	3,110	-60	-2%	3,150	3,760	610	16%
Total	**7,650**	**8,290**	**640**	**8%**	**6,740**	**8,030**	**1,290**	**16%**

Notes:
1. Volumes rounded to nearest 10.
2. Target = 2017 NBPP vehicle trip target = two-way peak hour.
Source: Fehr & Peers, 2020.

From **Figure 31** and **Table 8**, Shoreline Boulevard exceeded its vehicle trip cap by 2% during morning peak hour. Likewise, Rengstorff Avenue gateway exceeds its trip cap by 3% during evening peak hour. The San Antonio Road gateway has less traffic than its vehicle trip caps in both the morning and evening peak hours.

It should be noted that the Spring 2020 monitoring was conducted while several future development sites, such as Microsoft, Shashi Hotel, and Charleston East were not occupied. The future re-occupancy of those sites plus the other North Bayshore sites that are currently under construction have been accounted for in the Near-Term Growth Assessment included in the last chapter of this report.

From **Table 8**, during the morning peak hour, the San Antonio Road Gateway has about 16% of its vehicle trip cap remaining, the Rengstorff Avenue Gateway around 12%, and the Shoreline Boulevard Gateway exceeded its capacity by 2%. During the evening peak hour, the San Antonio Road Gateway has about 41% of its vehicle trip cap remaining, the Shoreline Boulevard Gateway around 16%, and the Rengstorff Avenue Gateway exceeded its trip cap by 3%.

Based on these comparisons of the observed two-way volumes to the vehicle trip caps adopted in the 2017 NBPP, San Antonio Road gateway is under its peak hour vehicle trip cap during both the morning and evening. However, Shoreline Boulevard gateway exceeds its vehicle trip cap by 2% during the morning peak hour and Rengstorff Avenue gateway exceeds its vehicle trip cap by 3% during the afternoon peak hour.

Potential Alternative Trip Targets

As described earlier, there are other ways to define trip targets, varying things like time period and direction of travel. For informational purposes, three alternative trip targets are presented here and compared to the Spring 2020 vehicle volumes:

- Two-way Peak Period: Two-way 3-hour peak period gateway vehicle volume during the morning and evening peak periods using the 2017 NBPP gateway capacity estimates (see **Table 9**).
- Directional Peak Hour: Inbound morning peak hour and outbound evening peak hour using the 2014 NBPP gateway capacity estimates (see **Table 10**). *Note that this target would need to be periodically adjusted as residential uses are added to NBS.*
- Directional Peak Period: Inbound morning peak period and outbound evening peak period using the 2014 NBPP gateway capacity estimates (see **Table 11**). *Note that this target would need to be periodically adjusted as residential uses are added to NBS.*

In almost all cases except for Shoreline Boulevard, the Spring 2020 observations fall below the alternative targets.

Table 9: Alternative Trip Target – Two-Way Peak Period

Gateway	Morning				Evening			
	Spring 2020 Volume	Target	Remaining Gateway Capacity	Percent of Gateway Capacity Remaining	Spring 2020 Volume	Target	Remaining Gateway Capacity	Percent of Gateway Capacity Remaining
San Antonio Road	3,920	5,110	1,190	23%	2,780	4,950	2,170	44%
Rengstorff Avenue	7,360	8,880	1,520	17%	6,510	6,590	80	1%
Shoreline Boulevard	9,320	8,390	-930	-11%	8,900	10,160	1,260	12%
Total	**20,600**	**22,380**	**1,780**	**8%**	**18,190**	**21,700**	**3,510**	**16%**

Notes:
1. Volumes rounded to nearest 10.
2. Target = 2017 NBPP vehicle trip target = two-way peak period.
Source: Fehr & Peers, 2020.

Table 10: Alternative Trip Target – Directional Peak Hour

Gateway	Morning				Evening			
	Spring 2020 Volume	Target	Remaining Gateway Capacity	Percent of Gateway Capacity Remaining	Spring 2020 Volume	Target	Remaining Gateway Capacity	Percent of Gateway Capacity Remaining
San Antonio Road	1,350	1,530	180	12%	850	1,340	490	37%
Rengstorff Avenue	2,480	2,960	480	16%	2,020	2,090	70	3%
Shoreline Boulevard	2,480	2,490	10	0%	2,410	2,730	320	12%
Total	**6,310**	**6,980**	**670**	**10%**	**5,280**	**6,160**	**880**	**14%**

Notes:
1. Volumes rounded to nearest 10.
2. Morning Target = Inbound morning peak hour; Evening Target = Outbound evening peak hour.
Source: Fehr & Peers, 2020.

Table 11: Alternative Trip Target – Directional Peak Period

Gateway	Morning				Evening			
	Spring 2020 Volume	Target	Remaining Gateway Capacity	Percent of Gateway Capacity Remaining	Spring 2020 Volume	Target	Remaining Gateway Capacity	Percent of Gateway Capacity Remaining
San Antonio Road	3,120	4,140	1,020	25%	2,090	3,620	1,530	42%
Rengstorff Avenue	6,130	7,990	1,860	23%	5,150	5,630	480	9%
Shoreline Boulevard	7,220	6,720	-500	-7%	6,750	7,380	630	9%
Total	**16,470**	**18,850**	**2,380**	**13%**	**13,990**	**16,630**	**2,640**	**16%**

Notes:
1. Volumes rounded to nearest 10.
2. Morning Target = Inbound morning peak period; Evening Target = Outbound evening peak period.
Source: Fehr & Peers, 2020.

Given that there are several possible trip targets, the Mountain View City Council has requested that comparisons be presented using both the 2014 NBPP and the 2017 NBPP capacity estimates. **Table 12** and **Table 13** present the comparison of the Spring 2020 observations to the 2014 NBPP gateway capacity for both the peak hour and peak period, respectively. **Table 14** and **Table 15** show the same type of comparison of the Spring 2020 observations to the 2017 NBPP gateway capacity for both the peak hour and peak period, respectively.

Table 12: Peak Hour Gateway Trip Target Comparison (2014 NBPP Capacities)

Gateway	Morning			Evening		
	Inbound	Outbound	Total	Inbound	Outbound	Total
Spring 2020 Volumes (A)						
San Antonio Road	1,350	240	1,590	230	850	1,080
Rengstorff Avenue	2,480	410	2,890	490	2,020	2,510
Shoreline Boulevard	2,480	690	3,170	740	2,410	3,150
Total	**6,310**	**1,340**	**7,650**	**1,460**	**5,280**	**6,740**
Gateway Capacity (2014 NBPP) (B)						
San Antonio Road	1,530	170	1,700	400	1,340	1,740
Rengstorff Avenue	2,960	330	3,290	350	2,090	2,440
Shoreline Boulevard	2,490	620	3,110	1,030	2,730	3,760
Total	**6,980**	**1,120**	**8,100**	**1,780**	**6,160**	**7,940**
Remaining Gateway Capacity (B-A=C)						
San Antonio Road	180	-70	110	170	490	660
Rengstorff Avenue	480	-80	400	-140	70	-70
Shoreline Boulevard	10	-70	-60	290	320	610
Total	**670**	**-220**	**450**	**320**	**880**	**1,200**
Percent of Gateway Capacity Remaining (C/B=D)						
San Antonio Road	12%	-41%	6%	43%	37%	38%
Rengstorff Avenue	16%	-24%	12%	-40%	3%	-3%
Shoreline Boulevard	0%	-11%	-2%	29%	12%	16%
Total	**10%**	**-20%**	**6%**	**19%**	**14%**	**15%**

Notes: Vehicle volumes rounded to nearest 10. The 2014 NBPP trip targets focused on the overall total volume at each gateway, as well as the peak direction of travel (inbound in the morning, outbound in the evening). All other data is shown in light grey text to indicate that it is being provided for informational purposes only.
Source: Fehr & Peers, 2020.

Table 13: Peak Period Gateway Trip Target Comparison (2014 NBPP Capacities)

Gateway	Morning			Evening		
	Inbound	Outbound	Total	Inbound	Outbound	Total
Spring 2020 Volumes (A)						
San Antonio Road	3,120	800	3,920	690	2,090	2,780
Rengstorff Avenue	6,130	1,230	7,360	1,360	5,150	6,510
Shoreline Boulevard	7,220	2,100	9,320	2,150	6,750	8,900
Total	**16,470**	**4,130**	**20,600**	**4,200**	**13,990**	**18,190**
Gateway Capacity (2014 NBPP) (B)						
San Antonio Road	4,140	460	4,600	1100	3,620	4,720
Rengstorff Avenue	7,990	880	8,870	950	5,630	6,580
Shoreline Boulevard	6,720	1,680	8,400	2,780	7,380	10,160
Total	**18,850**	**3,020**	**21,870**	**4,830**	**16,630**	**21,460**
Remaining Gateway Capacity (B-A=C)						
San Antonio Road	1,020	-340	670	410	1,530	1,940
Rengstorff Avenue	1,860	-350	1,510	-410	480	70
Shoreline Boulevard	-500	-420	-920	630	630	1,260
Total	**2,380**	**-1,110**	**1,270**	**630**	**2,640**	**3,270**
Percent of Gateway Capacity Remaining (C/B=D*100)						
San Antonio Road	25%	-76%	15%	37%	42%	41%
Rengstorff Avenue	23%	-40%	17%	-43%	9%	1%
Shoreline Boulevard	-7%	-25%	-11%	23%	9%	12%
Total	**13%**	**-37%**	**6%**	**13%**	**16%**	**15%**

Notes: Vehicle volumes rounded to nearest 10. The 2014 NBPP trip targets focused on the overall total volume at each gateway, as well as the peak direction of travel (inbound in the morning, outbound in the evening). All other data is shown in light grey text to indicate that it is being provided for informational purposes only.
Source: Fehr & Peers, 2020.

Table 14: Peak Hour Gateway Trip Target Comparison (2017 NBPP Capacities)

Gateway	Morning			Evening		
	Inbound	Outbound	Total	Inbound	Outbound	Total
Spring 2020 Volumes (A)						
San Antonio Road	1,350	240	1,590	230	850	1,080
Rengstorff Avenue	2,480	410	2,890	490	2,020	2,510
Shoreline Boulevard	2,480	690	3,170	740	2,410	3,150
Total	**6,310**	**1,340**	**7,650**	**1,460**	**5,280**	**6,740**
Gateway Capacity (2017 NBPP) (B)						
San Antonio Road	1,460	430	1,890	490	1,340	1,830
Rengstorff Avenue	2,620	670	3,290	650	1,790	2,440
Shoreline Boulevard	2,220	890	3,110	1,170	2,590	3,760
Total	**6,300**	**1,990**	**8,290**	**2,310**	**5,720**	**8,030**
Remaining Gateway Capacity (B-A=C)						
San Antonio Road	110	190	300	260	490	750
Rengstorff Avenue	140	260	400	160	-230	-70
Shoreline Boulevard	-260	200	-60	430	180	610
Total	**-10**	**650**	**640**	**850**	**440**	**1,290**
Percent of Gateway Capacity Remaining (C/B=D)						
San Antonio Road	8%	44%	16%	53%	37%	41%
Rengstorff Avenue	5%	39%	12%	25%	-13%	-3%
Shoreline Boulevard	-12%	22%	-2%	37%	7%	16%
Total	**0%**	**33%**	**8%**	**37%**	**8%**	**16%**

Notes: The 2017 NBPP trip targets focused on the overall total volume at each gateway. All other data is shown in light grey text to indicate that it is being provided for informational purposes only.
Source: Fehr & Peers, 2020.

Table 15: Peak Period Gateway Trip Target Comparison (2017 NBPP Capacities)

Gateway	Morning			Evening		
	Inbound	Outbound	Total	Inbound	Outbound	Total
Spring 2020 Volumes (A)						
San Antonio Road	3,120	800	3,920	690	2,090	2,780
Rengstorff Avenue	6,130	1,230	7,360	1,360	5,150	6,510
Shoreline Boulevard	7,220	2,100	9,320	2,150	6,750	8,900
Total	**16,470**	**4,130**	**20,600**	**4,200**	**13,990**	**18,190**
Gateway Capacity (2017 NBPP) (B)						
San Antonio Road	3,950	1,160	5,110	1,330	3,620	4,950
Rengstorff Avenue	7,070	1,810	8,880	1,760	4,830	6,590
Shoreline Boulevard	5,990	2,400	8,390	3,160	7,000	10,160
Total	**17,010**	**5,370**	**22,380**	**6,250**	**15,450**	**21,700**
Remaining Gateway Capacity (B-A=C)						
San Antonio Road	830	360	1,190	640	1,530	2,170
Rengstorff Avenue	940	580	1,520	400	-320	80
Shoreline Boulevard	-1,230	300	-930	1,010	250	1,260
Total	**540**	**1,240**	**1,780**	**2,050**	**1,460**	**3,510**
Percent of Gateway Capacity Remaining (C/B=D*100)						
San Antonio Road	21%	31%	23%	48%	42%	44%
Rengstorff Avenue	13%	32%	17%	23%	-7%	1%
Shoreline Boulevard	-21%	13%	-11%	32%	4%	12%
Total	**3%**	**23%**	**8%**	**33%**	**9%**	**16%**

Notes: The 2017 NBPP trip targets focused on the overall total volume at each gateway. All other data is shown in light grey text to indicate that it is being provided for informational purposes only.

As expected from the earlier target comparisons, the peak direction volumes (inbound in the morning and outbound in the evening), and the two-way total volumes are within the trip targets and typically have 10 to 25 percent capacity still available, except for Shoreline Boulevard during morning peak hour and peak period and Rengstorff Avenue during evening peak hour. While the off-peak direction volumes (morning outbound and evening inbound) indicate being "over-capacity", that reflects the more balanced directional usage that is beginning to occur at the gateways, which was anticipated in the 2017 NBPP.

NEAR-TERM GROWTH ASSESSMENT

2. Near-Term Growth Assessment

With the ever-changing vehicular and technological trends in Silicon Valley, it is important to consider the future of transportation and planning in the North Bayshore District. In doing so, public agencies should be aware of the planned projects in the area, how these projects can affect the North Bayshore land use mix, vehicular traffic, North Bayshore gateway vehicle trip target, and the methods available for collecting and monitoring transportation data. This information can help decision makers with deciding the timing of North Bayshore District's future development and planned infrastructure.

This section describes the Near-Term Growth developments planned for North Bayshore, the estimated change in the gateway demand with occupancy of these new developments in the near future, and the estimated completion of planned transportation improvements.

Background

Historically, whenever new developments were proposed, the street system would be expanded to accommodate the increase in vehicle traffic associated with the increased land use density and intensity resulting from new development. However, the opportunity to expand the vehicle trip target at the North Bayshore gateways is limited. Thus, the North Bayshore Precise Plan (NBPP) solution is to require new developments to meet project driveway trip targets, and to reduce existing North Bayshore vehicle trips by requiring more effective transportation demand management (TDM) programs at existing office buildings and by adding residential opportunities to the North Bayshore District. Aligning the North Bayshore travel demand with the vehicle trip target at the gateways requires a multi-faceted approach, involving improved TDM programs and reduced vehicle usage for both existing and new employers in the area, as well as transportation improvements that could increase the operational vehicle trip target of the gateways. The following sections describe the Near-Term growth anticipated in North Bayshore, the estimated change in the gateway demand with occupancy of these new developments in the near future, and the estimated completion of planned transportation improvements. This analysis also evaluates the Near-Term Growth demand by gateway.

Near-Term Growth in North Bayshore

Since the adoption of the North Bayshore Precise Plan in December 2014, three development projects have been constructed and occupied (Sobrato – 1255 Pear Avenue Office building, Broadreach office building, and Intuit Marine Way office building). Trips from these new buildings are now being captured in the traffic counts conducted for each monitoring report. The following eight constructed or planned developments are anticipated to add vehicle trips to the North Bayshore gateway in the next few years (estimated completion date shown in parentheses):

- Intuit – Bayshore Parkway (2022)
- Microsoft (2020)
- Sobrato – 1255 Pear Avenue Mixed-Use Office and Residential (2023)
- Shashi Hotel (2020)
- Charleston East (2023)
- 1100 La Avenida Affordable Housing (2023)
- Landings and Huff Garage (2023)

The locations of these development projects are presented in **Figure 32**, and **Table 16** presents a summary of their associated land use assumptions (which in some cases involve demolition of existing buildings as well as construction of new buildings). For reference, **Figure 32** also shows the location of the remaining known and pending projects in the North Bayshore District.

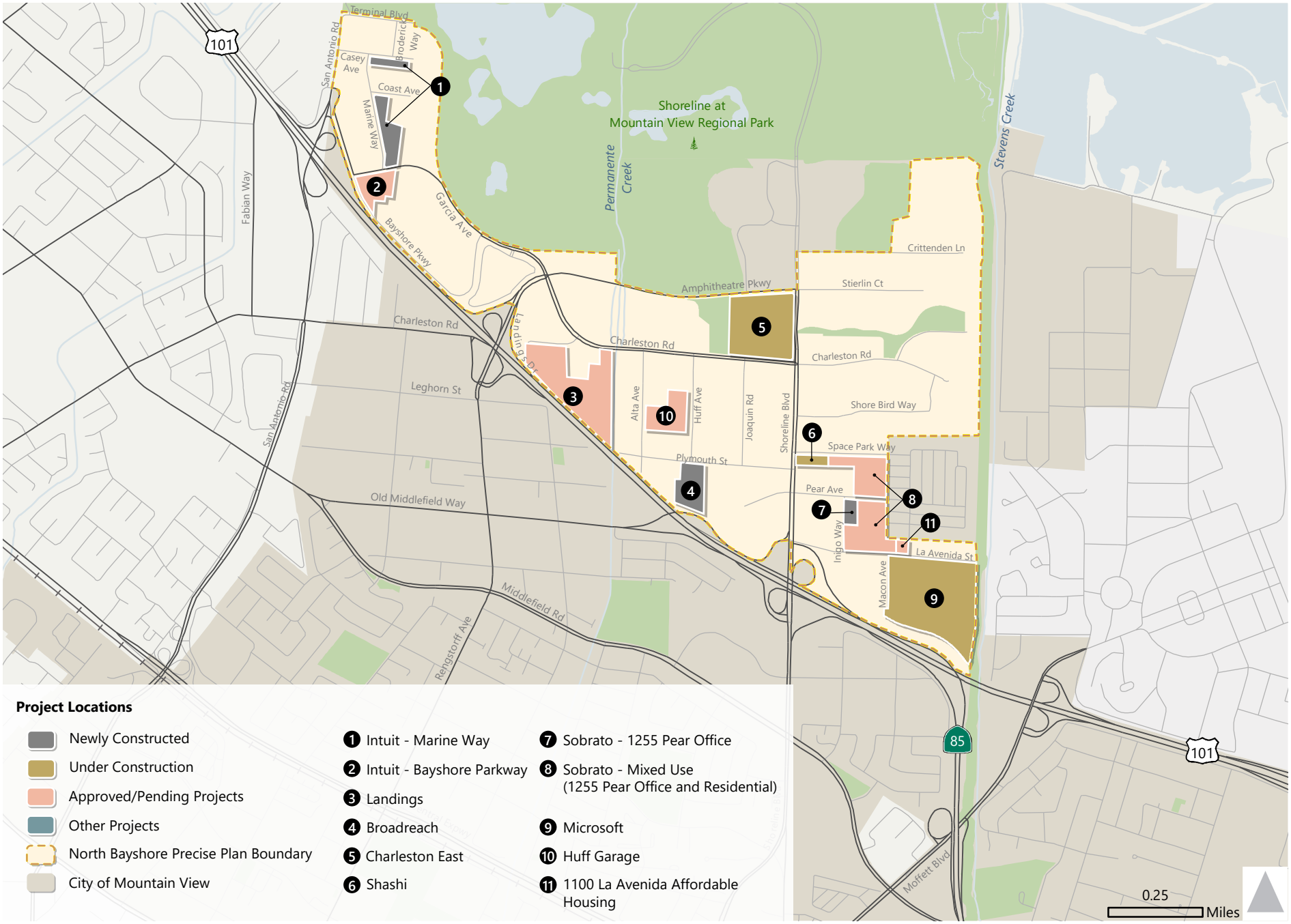


Figure 32

Project Locations

Table 16: North Bayshore Building Size of New Projects and Demolition/Remodel of Existing Buildings

Project	Industrial (s.f.)	Recreation (s.f.)	Multi-Family (Dwelling Units)	Hotel (Rooms)	Office (s.f.)	R&D (s.f.)	Restaurant (s.f.)	Retail (s.f.)	Service (s.f.)
Approved and Under Construction Developments									
Intuit (Bayshore Parkway)[2]					+178,600				
Microsoft[3]					+643,680				
Sobrato – 1255 Pear Ave. Mixed Use Office and Residential	(-103,513)		+785		+231,210				
Shashi Hotel				+200			+4,400	+4,000	
Charleston East					+595,000			+10,000	
1100 La Avenida Affordable Housing	(-3,723)		+93			(-8,726)			
Landings and Huff Garage					+799,482	(-249,224)		+10,096	
Total New Development			+878	+200	+2,447,972		+4,400	+24,096	
Total Demolition	(-107,236)					(-257,950)			
Net Total	**(-107,236)**		**+878**	**+200**	**+2,447,972**	**(-257,950)**	**+4,400**	**+24,096**	

Notes:

1. +# represents amount of new square footage to be constructed. (-#) represents amount of square footage to be demolished/remodeled relative to Spring 2019 Existing Conditions.
2. Existing buildings (32,500 s.f.) were recently demolished. These buildings are not included in the 2020 Existing Conditions.
3. Existing buildings (515,680 s.f.) are either demolished or vacant and being prepared for remodel. These buildings are not included in the 2020 Existing Conditions and therefore are not included as demolished buildings. Huff Garage building size not included in building summary.

Source: *1625 Plymouth Street Site Specific Transportation Analysis* (SSTA), 2016. *Shashi Hotel Project SSTA*, 2016. *Microsoft Silicon Valley Campus Project SSTA*, 2017, *2000 North Shoreline Boulevard SSTA*, 2017. *Intuit Master Plan – Marine Way and Bayshore Vehicle Trip Estimates*, 2014. *Project Driveway and Gateway Trip Generation Analysis for the Pear Avenue Mixed-Use Development Memorandum*, 2017. La Avenida Affordable Housing information from City of Mountain View staff, 2018. Landings information from City of Mountain View staff, 2019. Fehr & Peers, 2020.

Altogether, the seven developments will involve the following net increases in land use:

- 2,082,786 square feet of office, research & development, and industrial building space
- 200 hotel rooms
- 28,496 square feet of restaurant, retail, and service building space
- 878 multi-family dwelling units

Table 17 shows the land use totals by category, both for what exists today and for what is expected once the Near-Term Growth developments are constructed. The NBPP total building area is shown for reference.

Table 17: Land Use In North Bayshore Area: Total Building Area

Land Use	Units	Existing 2020	Near-Term Growth Conditions	North Bayshore Precise Plan
Single Family	Dwelling Units	1	1	1
Multi-Family	Dwelling Units	362	1,240	10,212
Subtotal (Residential) [A]	**Dwelling Units**	**363**	**1,241**	**10,213**
Office	Square Feet	804,666	3,252,638	5,948,796
Research & Development	Square Feet	5,810,084	5,552,134	4,544,684
Industrial	Square Feet	323,480	216,244	148,033
Subtotal (Office, R&D and Industrial) [B]	**Square Feet**	**6,938,230**	**9,021,016**	**10,641,513**
Retail and Restaurant	Square Feet	14,058	42,554	198,538
Service Commercial	Square Feet	26,138	26,138	26,138
Subtotal (Supporting Uses) [C]	**Square Feet**	**40,196**	**68,692**	**224,676**
Motel	Rooms	0	200	400
Church	Building	1	1	1
Institutional/Recreation[5]	Trips	4,142	4,142	10,469
Subtotal (Other Uses)	***(Various)***	***(Various)***	***(Various)***	**(Various)**
Total Residential [A]	**Dwelling Units**	**363**	**1,241**	**10,213**
Total Employment Uses [B+C]	**Square Feet**	**6,978,426**	**9,089,708**	**10,866,189**

Notes:
1. Land use summarized from the City of Mountain View VISUM model traffic analysis zones and recent Site Specific Transportation Analysis Reports.
2. For Existing 2020 vacant buildings include: 91,392 s.f. of R&D buildings are vacant at the Shoreline Commons site.
3. Near-Term Growth Conditions includes the existing development plus Intuit Bayshore Parkway office building, Microsoft, Sobrato – 1255 Pear Avenue Mixed-Use Office and Residential, Shashi Hotel, Charleston East, La Avenida Affordable Housing, and Landings and Huff Garage.

Source: City of Mountain View VISUM model, 2020.

Tables 18 and **19** show the occupied land use totals by category, both for what exists today and for what is expected once the Near-Term Growth developments are constructed.

Table 18: Land Use In North Bayshore Area: Occupied[5] Building Area

Land Use	Units	Existing 2020[2,3]	Near-Term Growth Conditions[4]	North Bayshore Precise Plan
Single Family	Dwelling Units	1	1	1
Multi-Family	Dwelling Units	362	1,240	10,212
Subtotal (Residential) [A]	**Dwelling Units**	**363**	**1,241**	**10,213**
Office	Square Feet	802,699	3,234,700	5,875,378
Research & Development	Square Feet	5,781,035	4,961,531	3,834,661
Industrial	Square Feet	321,863	193,241	137,671
Subtotal (Office, R&D and Industrial) [B]	**Square Feet**	**6,905,597**	**8,389,472**	**9,847,710**
Retail and Restaurant	Square Feet	13,988	41,059	192,931
Service Commercial	Square Feet	26,008	23,357	24,308
Subtotal (Supporting Uses) [C]	**Square Feet**	**39,996**	**64,416**	**217,239**
Motel	Rooms	0	200	400
Church	Building	1	1	1
Institutional/Recreation	Trips	4,142	4,142	10,469
Subtotal (Other Uses)	***(Various)***	***(Various)***	***(Various)***	**(Various)**
Total Residential [A]	**Dwelling Units**	**363**	**1,241**	**10,213**
Total Employment Uses [B+C]	**Square Feet**	**6,945,593**	**8,453,888**	**10,064,949**

Notes:

1. Land use summarized from the City of Mountain View VISUM model traffic analysis zones and recent Site Specific Transportation Analysis Reports.
2. For Existing 2020 vacant buildings include: 91,392 s.f. of R&D buildings are vacant at the Shoreline Commons site.
3. Under Existing 2020, the remainder of the office, R&D, industrial, retail, restaurant, and service commercial buildings are assumed to be "Occupied" with a ½ percent vacancy rate of the total existing building square footage.
4. Near-Term Growth Conditions includes the existing development plus Intuit Bayshore Parkway office building, Microsoft, Sobrato – 1255 Pear Avenue Mixed-Use Office and Residential, Shashi Hotel, Charleston East, La Avenida Affordable Housing, and Landings and Huff Garage.
5. "Occupied" building square footage accounts for a 7 percent vacancy rate off the total building square footage under Near-Term Growth Conditions for the office, R&D, industrial, retail, restaurant, and service commercial buildings. For informational purposes, if there were a zero-vacancy rate, square footage is: Existing Conditions = 6,978,426 square feet, and Near-Term Growth Conditions = 9,089,708 square feet.

Source: City of Mountain View VISUM model, 2020.

Table 19: Land Use In North Bayshore Area: Employee and Population Estimates

Land Use	Units	Existing 2020[2,3]	Near-Term Growth Conditions[4,5]	North Bayshore Precise Plan[5]
Single Family	Population	2	2	2
Multi-Family	Population	760	2,356	17,998
Subtotal (Residential) [A]	**Population**	**762**	**2,358**	**18,000**
Office	Employees	3,211	12,939	23,795
Research & Development	Employees	20,116	17,365	15,906
Industrial	Employees	386	232	178
Subtotal (Office, R&D and Industrial) [B]	**Employees**	**23,713**	**30,536**	**39,879**
Retail and Restaurant	Employees	80	165	547
Service Commercial	Employees	78	70	78
Subtotal (Supporting Uses) [C]	**Employees**	**158**	**235**	**625**
Motel	Employees	0	80	160
Church	Employees	10	10	10
Institutional/Recreation	Employees	414	414	1,047
Subtotal (Other Uses) [D]	**Employees**	***424***	***504***	**1,217**
Total Residential [A]	**Dwelling Units**	**762**	**2,358**	**18,000**
Total Employment Uses [B+C+D]	**Employees**	**24,295**	**31,275**	**41,721**
Service Population [A+B+C+D]		**25,057**	**33,633**	**59,721**

Notes:

1. Land use summarized from the City of Mountain View VISUM model traffic analysis zones and recent Site Specific Transportation Analysis Reports.
2. For Existing 2020 vacant buildings include: 91,392 s.f. of R&D buildings are vacant at the Shoreline Commons site.
3. Under Existing 2020, the office, R&D, industrial, retail, restaurant, and service commercial buildings are assumed to be "Occupied" with a ½ percent vacancy rate of the total existing building square footage.
4. Near-Term Growth Conditions includes the existing development plus Intuit Bayshore Parkway office building, Microsoft, Sobrato Mixed-Use development, Shashi Hotel, Charleston East, La Avenida Affordable Housing, and The Landings.
5. "Occupied" building square footage accounts for a 7 percent vacancy rate off the total building square footage under Near-Term Growth Conditions for the office, R&D, industrial, retail, restaurant, and service commercial buildings.
6. For informational purposes, if there were a zero-vacancy rate, total employee estimates would include: Existing Conditions = 24,407 employees, and Near-Term Growth Conditions = 33,457 employees.

Source: City of Mountain View VISUM Model, 2020.

Near-Term Growth Vehicle Demand

This section describes the effects of the Near-Term developments on traffic demand at the gateways. It is important to note that accommodating the planned future development within the existing three gateways

will involve not only setting trip targets for new developments, but also reducing trip generation from existing buildings. As a result, simply summing up the trip targets from each new development site will result in a number of "new" trips that, when added to the existing level of traffic at the gateways, would exceed the gateway vehicle trip target. As shown in subsequent sections, this gateway demand analysis is done without and with the existing vehicle trip reduction.

The gateway trip generation with the seven developments are presented in **Appendix F**. The trip generation methods described below are consistent with the trip generation methods described in detail in the *North Bayshore Precise Plan with Residential – Project Trip Generation Estimates* memorandum in Appendix G of the *North Bayshore Precise Plan Transportation Impact Analysis* (July 2017) (see **Appendix F**). The residential person trip rates and external mode split are based on the residential surveys in North San José, Stanford, and the California Household Travel Survey. The residential internalization rate is based on similar mixed-use developments across the United States and verified with the Census journey to work survey. The office person and vehicle trip rates are based on the North Bayshore Precise Plan policy to accommodate office development within the North Bayshore area gateway vehicle trip target and 45 percent single occupancy vehicle target.

Table 20 and **Table 21** shows the estimated gateway morning and evening peak hour trip generation after completion of the seven developments without and with additional TDM applied to existing buildings, respectively. The following summarizes the results:

- **Existing Gateway Trips**: This represents existing gateway volumes calculated from the counts conducted at the North Bayshore gateways during the Spring 2020 traffic monitoring, with an estimated 24,295 employees (assuming a ½ percent vacancy rate) and 762 residents. Expressed as a rate, this equates to 0.31 vehicle trips per employee during the morning peak hour and 0.28 vehicle trips per employee during the evening peak hour.

- **New Project Traffic Cap**: This represents new vehicle trips generated by the projects. The office space in the Near-Term developments is assumed to be 100 percent occupied at a density of 4.0 employees per 1,000 square feet gross floor area. The office vehicle trip rates are based on the North Bayshore Precise Plan policy to accommodate office development within the North Bayshore area gateway vehicle trip target using no more than a 45 percent single occupancy vehicle target. Trip generation rates for new office uses are 0.21 total vehicle trips per employee during the morning peak hour and 0.19 total vehicle trips per employee during the evening peak hour. For the non-office "other" uses, trip rates are the relevant rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (9th Edition).

- **Existing Building Demolition Credit:** This represents vehicle trips generated by the project site land use before the project is built. These trips will be removed with the demolition of the existing

buildings. The credit for demolition of existing buildings is based on the existing building credit from each Site Specific Transportation Analysis study (SSTA), and information from City of Mountain View staff.

- **North Bayshore Gateway Vehicle Trip Reduction Share**: To accommodate development within the gateway vehicle trip target, including already approved developments, some of the existing trips from already-occupied buildings must be reduced by more than 25 percent. The "gateway vehicle trip reduction share" is each new development project's share of the total existing vehicle trip reduction necessary to achieve the overall vehicle trip target. As described above, it is expected that the gateway trip reduction will be achieved through a combination of adding residential units in North Bayshore and implementing highly effective TDM programs at existing buildings. It is worth noting that the gateway vehicle trip reduction share could also be achieved by increasing existing building vacancy rates to 14 percent, combined with full occupancy of the new buildings, to result in an area wide vacancy rate of 7 percent which is the historical average for this area. Limiting the number of employees for new developments can also help reduce trips. The entitlement of the Charleston East project restricted employee headcounts, presenting a method for limiting trips that could be applied to other projects. Regardless of how the gateway trip reduction is achieved, the net effect would be that for each new project that is built in North Bayshore, the net increase in total trips at the gateways would be such that volumes remain under the gateway vehicle trip targets. **Table 18** presents the North Bayshore Gateway vehicle volumes and the necessary trip reductions to accommodate the near-term developments without additional TDM applied to existing buildings. While **Table 19** and **Figure 33** present the North Bayshore Gateway vehicle volumes and the required trip reductions (with additional TDM applied to existing buildings) in order to accommodate the near-term developments within the gateway vehicle trip target.

- **Near-Term Gateway Total**: This is the total number of vehicle trips at the gateways, combining all of the factors listed above. As described earlier, for the full buildout of the NBPP, the total number of trips at the gateway equals the trip target. Over time, the Near-Term Growth vehicle trip generation will be compared to gateway vehicle trip targets to determine if additional development can be accommodated.

- **New Residential Development**: The Sobrato Mixed-Use development includes 785 residential units that are assumed to be a mix of affordable housing units and market rate units. The 150 affordable units (estimated number of units on a parcel dedicated to the City) assume a household size of 1.75 persons per household and the smaller-than-typical parking ratio per the North Bayshore Precise Plan Update of 0.60 parking spaces per dwelling unit. The 635 market rate units will be somewhat larger units on average, and assume an average household size of 1.80 persons per household and a parking ratio of 0.69 spaces per dwelling unit. This results in an estimate of approximately 1,400 residents. The proposed residential uses would have a combined effective trip generation rate of approximately 0.21 vehicle trips per dwelling unit during the morning peak hour

and 0.30 vehicle trips per dwelling unit during the evening peak hour. These combined effective residential trip generation rates (0.21 vehicle trips per dwelling unit during the morning peak hour and 0.30 vehicle trips per dwelling unit during the evening peak hour) were also applied to the La Avenida Street Affordable Housing Development of 93 multi-family units. Under Near-Term Growth Conditions, the residential uses are estimated to internalize approximately 40 percent of the morning peak hour person trips and approximately 34 percent of the evening peak hour trips.

The vehicular gateways in and out of North Bayshore are already at or near vehicle trip targets during peak times. Adding new developments in North Bayshore will add more vehicle trips to the gateways. In order to achieve the NBPP's policy of capping the number of vehicles using the gateways during peak hour, new buildings must generate vehicle trips at very low rates to achieve their driveway trip cap, and existing buildings must reduce the number of vehicle trips they contribute to the gateways. Some of the existing office vehicle trips will be removed from the gateways with the addition of residences near the office development in North Bayshore.

Another way in which existing vehicle trips may be removed from the gateways is by current tenants and building owners implementing highly effective transportation demand management (TDM) programs that reduce vehicle trips (such as by shifting from driving alone to carpooling, telecommuting or shifting the time of day they travel).

Table 20: Near-Term All Gateways Combined Morning and Evening Peak Hour Trip Generation (Without Additional TDM Applied to Existing Buildings)

	Morning Peak Hour			Evening Peak Hour		
	Inbound	**Outbound**	**Total**	**Inbound**	**Outbound**	**Total**
Existing Gateway Trips[1]	6,310	1,340	7,650	1,460	5,280	6,740
New Project Traffic Cap[1]	2,090	460	2,550	590	1,880	2,470
Existing Demolition Credit[1]	-130	-50	-180	-110	-180	-290
North Bayshore Gateway Vehicle Trip Reduction Share[1]	-860	-70	-930	-30	-540	-570
Near-Term Gateway Trip Total[1] (A)	7,410	1,680	9,090	1,910	6,440	8,350
Net New Gateway Traffic	**1,100**	**340**	**1,440**	**450**	**1,160**	**1,610**
Peak Hour Gateway 2014 NBPP Capacity Comparison						
2014 NBPP Gateway Capacity (B)	**6,980**		**8,100**		**6,160**	**7,940**
Difference (A-B)	**430**		**990**		**280**	**410**
Percent Over Capacity	6%		12%		5%	5%
Peak Hour Gateway 2017 NBPP Capacity Comparison						
2017 NBPP Gateway Capacity (B)			**8,290**			**8,030**
Difference (A-B)			**800**			**320**
Percent Over Capacity			10%			4%

Notes:

1. Definitions for each row are included on previous page of this report.
2. Values rounded to nearest 10.
3. This table accounts for trips related to Intuit Bayshore Parkway office building, Microsoft, Sobrato – 1255 Pear Avenue Mixed-Use Office and Residential, Shashi Hotel, Charleston East, La Avenida Affordable Housing, and Landings and Huff Garage.
4. The 2,550 trips from the New Project Traffic Cap for the morning inbound peak hour is based on each project achieving its project driveway trip cap target.
5. Source: *1625 Plymouth Street Site Specific Transportation Analysis* (SSTA), 2016. *Shashi Hotel Project SSTA*, 2016. *Microsoft Silicon Valley Campus Project SSTA*, 2017, *2000 North Shoreline Boulevard SSTA*, 2017. *Intuit Master Plan – Marine Way and Bayshore Vehicle Trip Estimates*, 2014. *Project Driveway and Gateway Trip Generation Analysis for the Pear Avenue Mixed-Use Development Memorandum*, 2017. La Avenida Affordable Housing information from City of Mountain View staff, 2018. Landings information from City of Mountain View staff, 2019. Fehr & Peers, 2020.

Table 21: Near-Term All Gateways Combined Morning and Evening Peak Hour Trip Generation (With Additional TDM applied to Existing Buildings)

	Morning Peak Hour			Evening Peak Hour		
	Inbound	**Outbound**	**Total**	**Inbound**	**Outbound**	**Total**
Existing Gateway Trips[1]	6,310	1,340	7,650	1,460	5,280	6,740
New Project Traffic Cap[1]	2,090	460	2,550	590	1,880	2,470
Existing Demolition Credit[1]	-130	-50	-180	-110	-180	-290
North Bayshore Gateway Vehicle Trip Reduction Share[1]	-1,510	-250	-1,760	-150	-950	-1,100
Near-Term Gateway Trip Total[1] (A)	6,760	1,500	8,260	1,790	6,030	7,820
Net New Gateway Traffic	450	160	610	330	750	1,080
Peak Hour Gateway 2014 NBPP Capacity Comparison						
2014 NBPP Gateway Capacity (B)	**6,980**		**8,100**		**6,160**	**7,940**
Difference (A-B)	**-220**		**160**		**-130**	**-120**
Percent Over Capacity	-3%		2%		-2%	-3%
Peak Hour Gateway 2017 NBPP Capacity Comparison						
2017 NBPP Gateway Capacity (B)			**8,290**			**8,030**
Difference (A-B)			**-30**			**-210**
Percent Over Capacity			0%			-3%

Notes:
1. Definitions for each row are included on previous page of this report.
2. Values rounded to nearest 10.
3. This table accounts for trips related to Intuit Bayshore Parkway office building, Microsoft, Sobrato – 1255 Pear Avenue Mixed-Use Office and Residential, Shashi Hotel, Charleston East, La Avenida Affordable Housing, and Landings and Huff Garage.
4. The 2,550 trips from the New Project Traffic Cap for the morning inbound peak hour is based on each project achieving its project driveway trip cap target.
5. Source: *1625 Plymouth Street Site Specific Transportation Analysis* (SSTA), 2016. *Shashi Hotel Project SSTA*, 2016. *Microsoft Silicon Valley Campus Project SSTA*, 2017, *2000 North Shoreline Boulevard SSTA*, 2017. *Intuit Master Plan – Marine Way and Bayshore Vehicle Trip Estimates*, 2014. *Project Driveway and Gateway Trip Generation Analysis for the Pear Avenue Mixed-Use Development Memorandum*, 2017. La Avenida Affordable Housing information from City of Mountain View staff, 2018. Landings information from City of Mountain View staff, 2019. Fehr & Peers, 2020.

Under Near-Term Growth Conditions, approximately 80 percent of the office development will include a driveway vehicle trip target as a condition of occupying a new or re-built office building, which is part of the North Bayshore Gateway Trip Reduction Solution (discussed in the next section).

As shown in **Table 20**, we can see that the Near-Term Growth Condition would begin to exceed gateway vehicle trip targets in some circumstances. One of the key assumptions in the NBPP is that existing buildings would need to increase TDM effectiveness to accommodate future development in North Bayshore. **Table 21** illustrates the NBS Gateway Vehicle Trip Reduction Share with additional TDM applied to existing buildings.

As an additional evaluation step, the Near-Term Growth gateway demand volumes shown in **Tables 20** and **21** were allocated to each gateway using the gateway distributions shown in **Appendix F**. The gateway distributions were developed using the NBS VISUM travel model and vary by North Bayshore area. **Tables 22** to **25** summarize the Near-Term Growth gateway demand volumes by gateway.

Table 22: Near-Term Gateway Morning Peak Hour Trip Generation by Gateway (Without Additional TDM Applied to Existing Buildings)

	San Antonio			Rengstorff			Shoreline		
	In	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Near-Term Gateway Trip Total[1] (A)	1,491	259	1,750	2,771	444	3,216	3,137	967	4,104
Peak Hour Gateway 2014 NBPP Capacity Comparison									
2014 NBPP Gateway Capacity (B)	**1,530**		**1,700**	**2,960**		**3,290**	**2,490**		**3,110**
Difference (A-B)	**-39**		**50**	**-189**		**-74**	**647**		**994**
Percent Over Capacity	-3%		3%	-6%		-2%	26%		32%
Peak Hour Gateway 2017 NBPP Capacity Comparison									
2017 NBPP Gateway Capacity (B)			**1,890**			**3,290**			**3,110**
Difference (A-B)			**-140**			**-74**			**994**
Percent Over Capacity			-7%			-2%			32%

Notes:
1. Definitions for each row are included on previous page of this report.
2. Values rounded to nearest 10.
3. This table accounts for trips related to Intuit Bayshore Parkway office building, Microsoft, Sobrato – 1255 Pear Avenue Mixed-Use Office and Residential, Shashi Hotel, Charleston East, La Avenida Affordable Housing, and Landings and Huff Garage.
4. The 2,550 trips from the New Project Traffic Cap for the morning inbound peak hour is based on each project achieving its project driveway trip cap target.

Source: *1625 Plymouth Street Site Specific Transportation Analysis* (SSTA), 2016. *Shashi Hotel Project SSTA*, 2016. *Microsoft Silicon Valley Campus Project SSTA*, 2017, *2000 North Shoreline Boulevard SSTA*, 2017. *Intuit Master Plan – Marine Way and Bayshore Vehicle Trip Estimates*, 2014. *Project Driveway and Gateway Trip Generation Analysis for the Pear Avenue Mixed-Use Development Memorandum*, 2017. La Avenida Affordable Housing information from City of Mountain View staff, 2018. Landings information from City of Mountain View staff, 2019. Fehr & Peers, 2020.

Table 23: Near-Term Gateway Evening Peak Hour Trip Generation by Gateway (Without Additional TDM Applied to Existing Buildings)

	San Antonio			Rengstorff			Shoreline		
	In	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Near-Term Gateway Trip Total[1] (A)	291	983	1,274	527	2,281	2,808	1,086	3,183	4,269
Peak Hour Gateway 2014 NBPP Capacity Comparison									
2014 NBPP Gateway Capacity (B)		**1,340**	**1,740**		**2,090**	**2,440**		**2,730**	**3,760**
Difference (A-B)		**-357**	**-466**		**191**	**368**		**453**	**509**
Percent Over Capacity		-27%	-27%		9%	15%		17%	14%
Peak Hour Gateway 2017 NBPP Capacity Comparison									
2017 NBPP Gateway Capacity (B)			**1,830**			**2,440**			**3,760**
Difference (A-B)			**-556**			**368**			**509**
Percent Over Capacity			-30%			15%			14%

Notes:

1. Definitions for each row are included on previous page of this report.
2. Values rounded to nearest 10.
3. This table accounts for trips related to Intuit Bayshore Parkway office building, Microsoft, Sobrato – 1255 Pear Avenue Mixed-Use Office and Residential, Shashi Hotel, Charleston East, La Avenida Affordable Housing, and Landings and Huff Garage.
4. The 2,550 trips from the New Project Traffic Cap for the morning inbound peak hour is based on each project achieving its project driveway trip cap target.
5. Source: *1625 Plymouth Street Site Specific Transportation Analysis* (SSTA), 2016. *Shashi Hotel Project SSTA*, 2016. *Microsoft Silicon Valley Campus Project SSTA*, 2017, *2000 North Shoreline Boulevard SSTA*, 2017. *Intuit Master Plan – Marine Way and Bayshore Vehicle Trip Estimates*, 2014. *Project Driveway and Gateway Trip Generation Analysis for the Pear Avenue Mixed-Use Development Memorandum*, 2017. La Avenida Affordable Housing information from City of Mountain View staff, 2018. Landings information from City of Mountain View staff, 2019. Fehr & Peers, 2020.

Table 24: Near-Term Gateway Morning Peak Hour Trip Generation by Gateway (With Additional TDM Applied to Existing Buildings)

	San Antonio			Rengstorff			Shoreline		
	In	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Near-Term Gateway Trip Total[1] (A)	1,416	248	1,664	2,573	414	2,988	2,768	827	3,595
Peak Hour Gateway 2014 NBPP Capacity Comparison									
2014 NBPP Gateway Capacity (B)	**1,530**		**1,700**	**2,960**		**3,290**	**2,490**		**3,110**
Difference (A-B)	**-114**		**-36**	**-387**		**-302**	**278**		**485**
Percent Over Capacity	-7%		-2%	-13%		-9%	11%		16%
Peak Hour Gateway 2017 NBPP Capacity Comparison									
2017 NBPP Gateway Capacity (B)			**1,890**			**3,290**			**3,110**
Difference (A-B)			**-226**			**-302**			**485**
Percent Over Capacity			-12%			-9%			16%

Notes:
1. Definitions for each row are included on previous page of this report.
2. Values rounded to nearest 10.
3. This table accounts for trips related to Intuit Bayshore Parkway office building, Microsoft, Sobrato – 1255 Pear Avenue Mixed-Use Office and Residential, Shashi Hotel, Charleston East, La Avenida Affordable Housing, and Landings and Huff Garage.
4. The 2,550 trips from the New Project Traffic Cap for the morning inbound peak hour is based on each project achieving its project driveway trip cap target.
Source: *1625 Plymouth Street Site Specific Transportation Analysis* (SSTA), 2016. *Shashi Hotel Project SSTA*, 2016. *Microsoft Silicon Valley Campus Project SSTA*, 2017, *2000 North Shoreline Boulevard SSTA*, 2017. *Intuit Master Plan – Marine Way and Bayshore Vehicle Trip Estimates*, 2014. *Project Driveway and Gateway Trip Generation Analysis for the Pear Avenue Mixed-Use Development Memorandum*, 2017. La Avenida Affordable Housing information from City of Mountain View staff, 2018. Landings information from City of Mountain View staff, 2019. Fehr & Peers, 2020.

Table 25: Near-Term Gateway Evening Peak Hour Trip Generation by Gateway (With Additional TDM Applied to Existing Buildings)

	San Antonio			Rengstorff			Shoreline		
	In	Out	Total	In	Out	Total	In	Out	Total
Near-Term Gateway Trip Total[1] (A)	278	941	1,219	501	2,171	2,672	1,010	2,929	3,939
Peak Hour Gateway 2014 NBPP Capacity Comparison									
2014 NBPP Gateway Capacity (B)		**1,340**	**1,740**		**2,090**	**2,440**		**2,730**	**3,760**
Difference (A-B)		**-399**	**-521**		**81**	**232**		**199**	**179**
Percent Over Capacity		-30%	-30%		4%	10%		7%	5%
Peak Hour Gateway 2017 NBPP Capacity Comparison									
2017 NBPP Gateway Capacity (B)			**1,830**			**2,440**			**3,760**
Difference (A-B)			**-611**			**232**			**179**
Percent Over Capacity			-33%			10%			5%

Notes:
1. Definitions for each row are included on previous page of this report.
2. Values rounded to nearest 10.
3. This table accounts for trips related to Intuit Bayshore Parkway office building, Microsoft, Sobrato – 1255 Pear Avenue Mixed-Use Office and Residential, Shashi Hotel, Charleston East, La Avenida Affordable Housing, and Landings and Huff Garage.
4. The 2,550 trips from the New Project Traffic Cap for the morning inbound peak hour is based on each project achieving its project driveway trip cap target.
5. Source: *1625 Plymouth Street Site Specific Transportation Analysis* (SSTA), 2016. *Shashi Hotel Project SSTA*, 2016. *Microsoft Silicon Valley Campus Project SSTA*, 2017, *2000 North Shoreline Boulevard SSTA*, 2017. *Intuit Master Plan – Marine Way and Bayshore Vehicle Trip Estimates*, 2014. *Project Driveway and Gateway Trip Generation Analysis for the Pear Avenue Mixed-Use Development Memorandum*, 2017. La Avenida Affordable Housing information from City of Mountain View staff, 2018. Landings information from City of Mountain View staff, 2019. Fehr & Peers, 2020.

Key Findings

The results from all scenarios show that locating most of the development near the Shoreline gateway means that the Shoreline gateway is likely to be the first gateway to exceed the morning peak hour target. Under the current adopted two-way trip cap the exceedance would be about 1,000 vehicles; if the Council were to adopt an alternate trip cap focused just on the inbound direction the exceedance would be about 650 vehicles. During the same morning peak hour, the San Antonio gateway exceeds the adopted two-way trip cap by about 50 vehicles, while the Rengstorff gateway would be under capacity by 80 vehicles.

In the evening peak hour, the Shoreline and Rengstorff gateways would likely exceed gateway capacity by anywhere from 200 to 500 vehicles, depending on the location and whether the current trip cap is

maintained or the Council adopts an alternate target. The San Antonio gateway would be under capacity by 360 to 560 vehicles.

The NBPP transportation policy framework relies on increasing the existing building TDM effectiveness and using each gateway more effectively. If either of these polices is not enough, there are several other options that could be considered to reduce the demand and/or increase the vehicle trip targets, such as:

- **Modify New Building Trip Targets** – To reduce gateway vehicle trip demand, new development could be required to generate fewer or possibly no net new driveway vehicle trips.
- **Modify the Project Size or Defer Building Occupancy** – To reduce gateway vehicle trip demand, a new project could be reduced in size, or building occupancy could be deferred until the gateway demand is observed to no longer exceed the vehicle trip target.
- **Add Gateway Capacity** – The addition of a new gateway(s) would provide additional capacity for travel in and out of the North Bayshore area. Possible gateway connections might include a bridge over Stevens Creek near Charleston Road, and/or an additional crossing location of US 101 connecting Charleston Road to Landings Drive, as are being currently studied in the North Bayshore Circulation Feasibility Study. Any new gateway connection would need to be evaluated to determine its benefits and impacts.
- **Implement a Gateway Vehicle Trip Credit System** – A vehicle trip credit system could be developed to monetize the value of each gateway vehicle trip. Existing developments would receive an allotment of vehicle trips, and new developments could purchase a portion of the existing vehicle trips to offset their new trips.
- **Pricing Strategies** – The amount of vehicle demand at the gateway depends in part on the cost and convenience of travel, so pricing strategies could be used to influence travel demand. Examples of this would include pricing of parking spaces within the North Bayshore area, or congestion pricing at the entrances to North Bayshore.

North Bayshore Gateway Trip Reduction Solution

The concept of the North Bayshore gateway vehicle trip reduction share means that each new development would need to be combined with an incremental reduction in existing vehicle trips, so as to assure that the overall trip target is achieved once all planned new development is constructed. Property owners and tenants have varying abilities to reduce existing North Bayshore vehicle trips. Thus, the NBPP requires new developments to join the Mountain View Transportation Management Association, so that the collective effort of the members helps reduce existing vehicle trips. A property owner or tenant with a larger share of existing development in North Bayshore will have greater opportunities to reduce existing vehicle trip generation. For example, a larger tenant in North Bayshore could scale TDM measures more efficiently than a smaller tenant.

The combined effort of existing and new developments will need to incrementally reduce the gateway vehicle trips so that additional planned development can be accommodated. **Figure 33** explains the project trip targets and gateway trip reduction share for the Near-Term Growth developments. The exact magnitude of each of the North Bayshore Gateway Trip Reduction Shares would change as additional development is added to North Bayshore.

North Bayshore (NBS) district trips | *AM Inbound Peak Hr*
Near term growth site trips | *AM Inbound Peak Hr*
NBS district trips nearing capacity | *AM Inbound Peak Hr*
Gateway trip reductions | *AM Inbound Peak Hr*

1. Existing Vehicle Trips

Existing Project Site & Existing NBS Trips

The Near-Term Growth development sites generate **134 existing site vehicle trips** from the buildings on those sites. The rest of the NBS area generates **6,176 NBS vehicle trips**. The total NBS gateway is **6,310 total vehicle trips**.

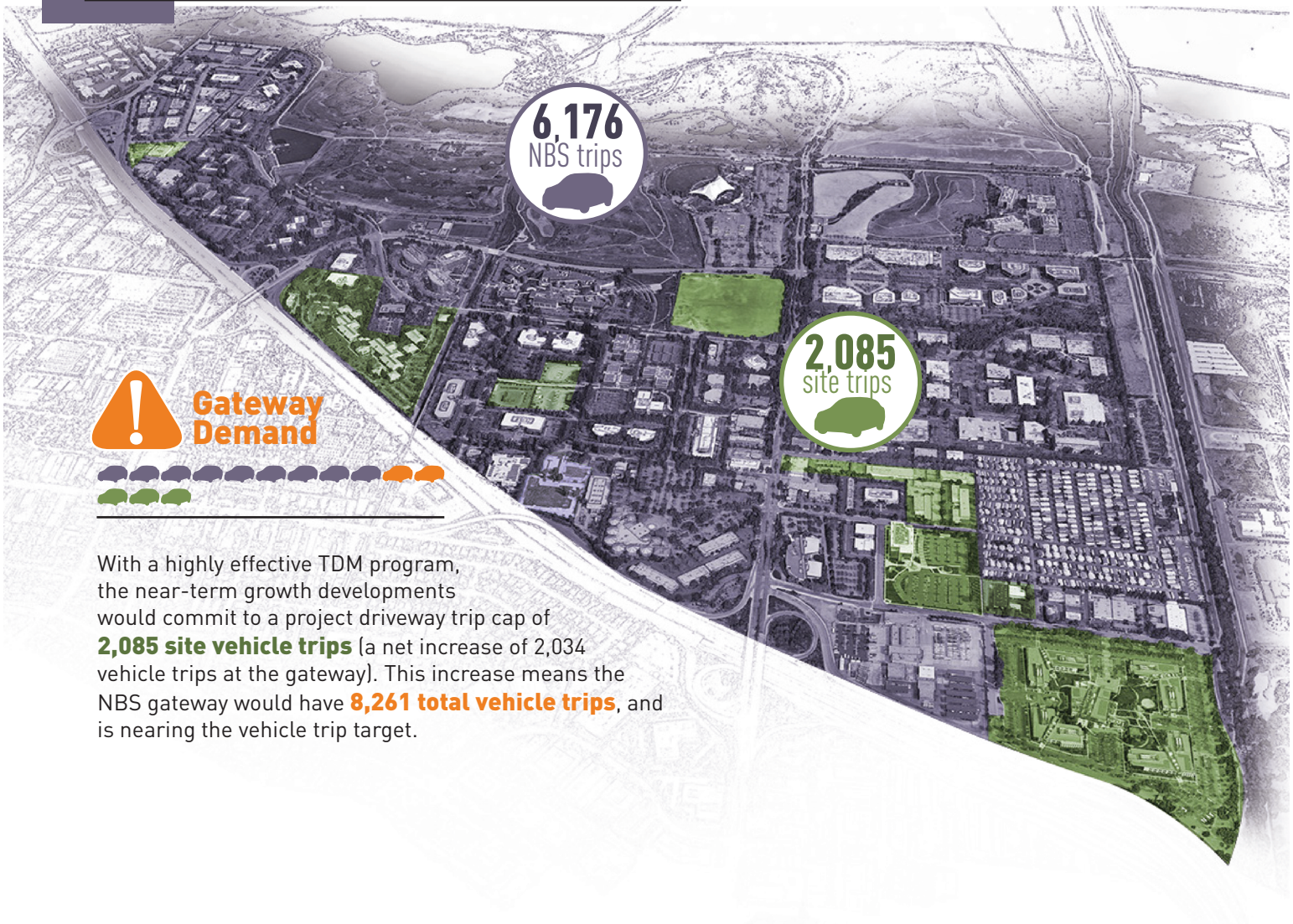
Figure 33-A

Near-Term Growth Project & Gateway Trip Generation Summary

North Bayshore (NBS) district trips | *AM Inbound Peak Hr*
Near term growth site trips | *AM Inbound Peak Hr*
NBS district trips nearing capacity | *AM Inbound Peak Hr*
Gateway trip reductions | *AM Inbound Peak Hr*

2. Driveway Trip Cap Trips

New Project Site & Existing NBS Trips



With a highly effective TDM program, the near-term growth developments would commit to a project driveway trip cap of **2,085 site vehicle trips** (a net increase of 2,034 vehicle trips at the gateway). This increase means the NBS gateway would have **8,261 total vehicle trips**, and is nearing the vehicle trip target.

Figure 33-B

Near-Term Growth Project & Gateway Trip Generation Summary

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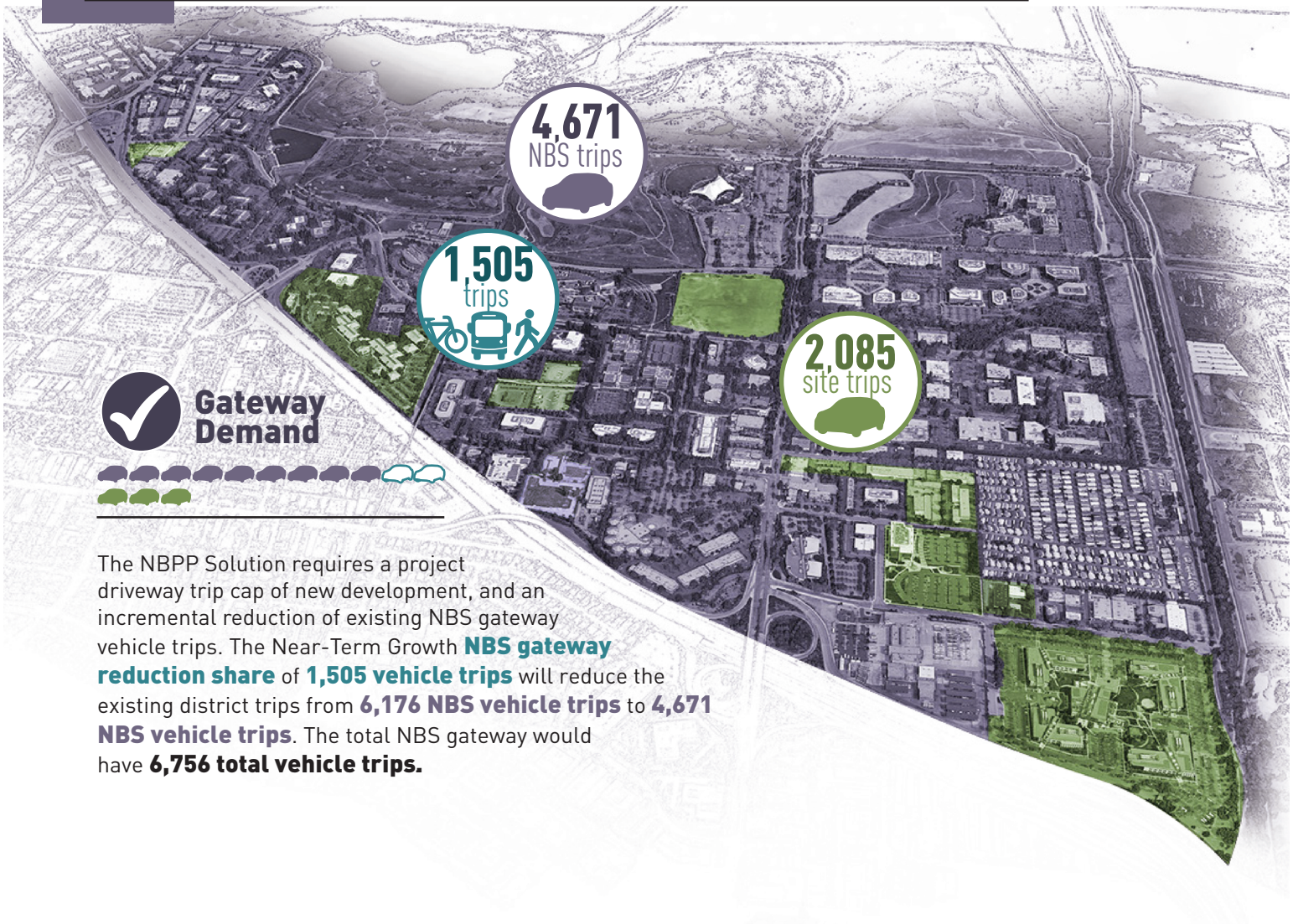
North Bayshore (NBS) district trips | *AM Inbound Peak Hr*
Near term growth site trips | *AM Inbound Peak Hr*
NBS district trips nearing capacity | *AM Inbound Peak Hr*
Gateway trip reductions | *AM Inbound Peak Hr*

3. The NBPP Solution

New Project Site & NBS Trips with NBS Gateway Reduction Share



The NBPP Solution requires a project driveway trip cap of new development, and an incremental reduction of existing NBS gateway vehicle trips. The Near-Term Growth **NBS gateway reduction share** of **1,505 vehicle trips** will reduce the existing district trips from **6,176 NBS vehicle trips** to **4,671 NBS vehicle trips**. The total NBS gateway would have **6,756 total vehicle trips.**

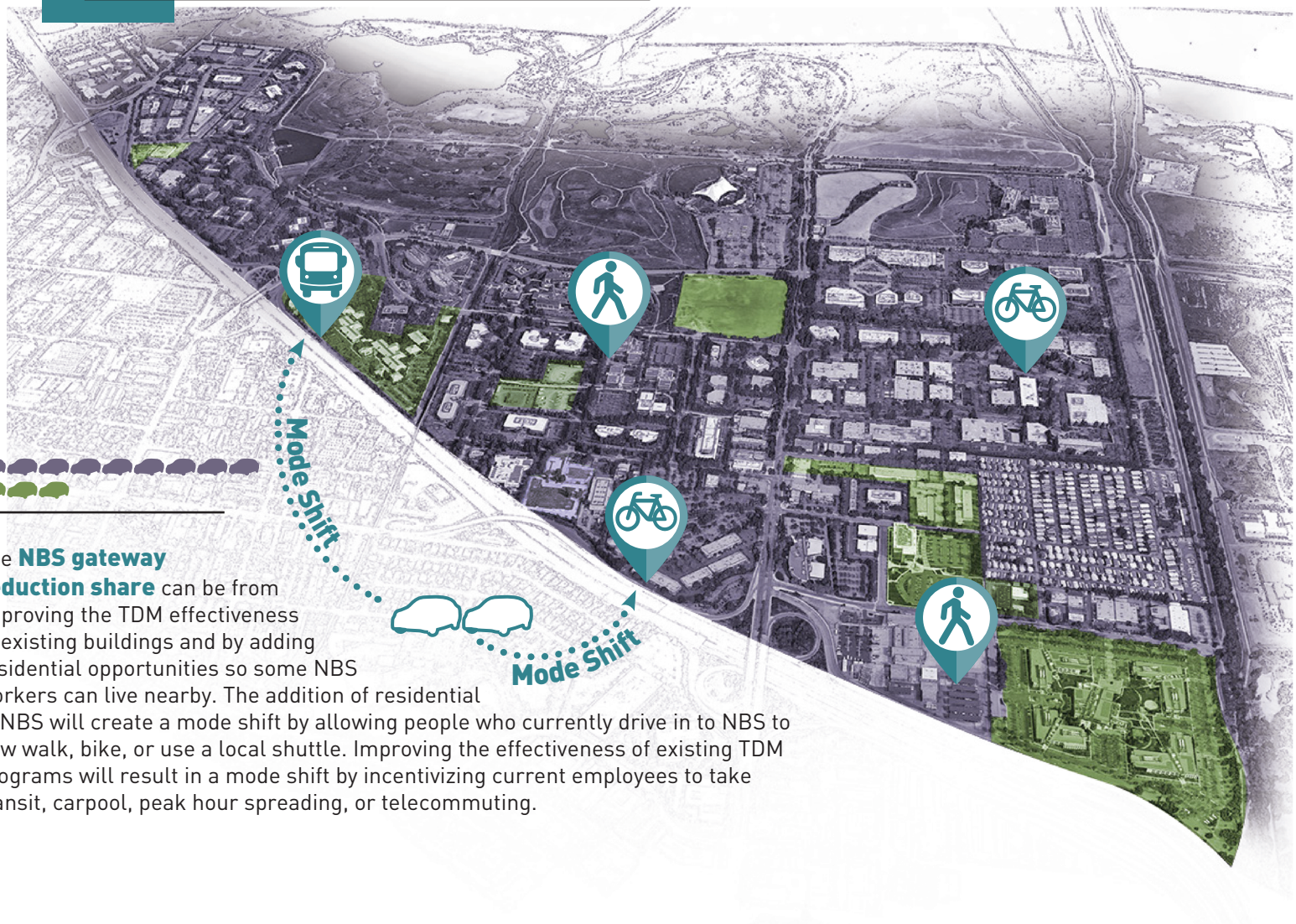
Figure 33-C

Near-Term Growth Project & Gateway Trip Generation Summary

North Bayshore (NBS) district trips | *AM Inbound Peak Hr*
Near term growth site trips | *AM Inbound Peak Hr*
NBS district trips nearing capacity | *AM Inbound Peak Hr*
Gateway trip reductions | *AM Inbound Peak Hr*

NBS Gateway Reduction Share

A Closer Look at the NBPP Solution



The **NBS gateway reduction share** can be from improving the TDM effectiveness at existing buildings and by adding residential opportunities so some NBS workers can live nearby. The addition of residential in NBS will create a mode shift by allowing people who currently drive in to NBS to now walk, bike, or use a local shuttle. Improving the effectiveness of existing TDM programs will result in a mode shift by incentivizing current employees to take transit, carpool, peak hour spreading, or telecommuting.

Figure 33-D

Near-Term Growth Project & Gateway Trip Generation Summary

Near-Term Growth Transportation Network

The Near-Term Growth transportation network will include transportation improvements drawn from the priority transportation improvements in the NBPP as well as transportation mitigations identified in the *Final Subsequent Environmental Impact Report North Bayshore Precise Plan* (November 2017) and the Site Specific Transportation Analysis (SSTA) reports of individual developments. The improvements listed below will be constructed roughly concurrently with the Near-Term Growth developments. These improvements help to address current vehicle trip target issues at Shoreline Boulevard through improved local street connectivity and vehicle circulation at the gateway. This section identifies the transportation improvements needed to support the eight Near-Term development projects listed earlier, which are displayed on **Figure 32**:

- Recently Constructed or Under Construction Improvements

    1. East-west bicycle connection between Shoreline Boulevard and Stevens Creek Trail
    2. East-west greenway connection between Alta Avenue and Shoreline Boulevard
    3. Shoreline Boulevard Signalized bicycle crossing at east-west greenway
    4. San Antonio Road and Bayshore Parkway intersection improvements
    5. Shoreline Boulevard and Plymouth Street signalization
    6. Charleston Road Transit Corridor Improvements between Huff Avenue and Shoreline Boulevard

- Near-Term Transportation Improvements

    7. East-west greenway connection between Alta Avenue to Landings Office Development
    8. Amphitheatre Parkway and Garcia Avenue-Charleston Road signal timing modifications
    9. Shoreline Boulevard and Pear Avenue intersection improvements
        a. Addition of a northbound right turn lane.
        b. Modify the westbound approach to be a westbound left turn lane and a shared through-right lane with east/west split phasing.
    10. Plymouth Street Re-Alignment with Space Park Way
    11. Shoreline Boulevard / US 101 Northbound Off-Ramp Re-Alignment
    12. Extend Inigo Way from Pear Avenue to Space Park (part of Sobrato Mixed-Use Development)
    13. Extend Joaquin Road from Charleston Road to Amphitheatre Parkway (part of Charleston East project)

- Other City Prioritized Improvements

    14. Shoreline Boulevard Reversible Transit Lane between Middlefield Road and Pear Avenue.
    15. US 101 Bicycle and Pedestrian Path between Terra Bella Avenue (West of Shoreline Boulevard) and Plymouth Street.
    16. Charleston Road Transit Corridor improvements between Salado Drive and Huff Avenue
    17. Amphitheatre Parkway widening from Permanente Creek to Shoreline Boulevard
    18. Shoreline Boulevard and Plymouth Street intersection improvement
        a. Addition of a second northbound left turn lane

To help understand the timing of each improvement, the dates are summarized in **Table 26**. Other City-prioritized transportation improvements that are important but not associated with conditions of approval for the eight Near-Term development projects are also included on **Table 26** and **Figure 34**. Finally, **Figure 35** shows the timing of the eight Near-Term development projects and the transportation projects, which illustrates that most of the Near-Term development projects and transportation improvements will be built by 2023.

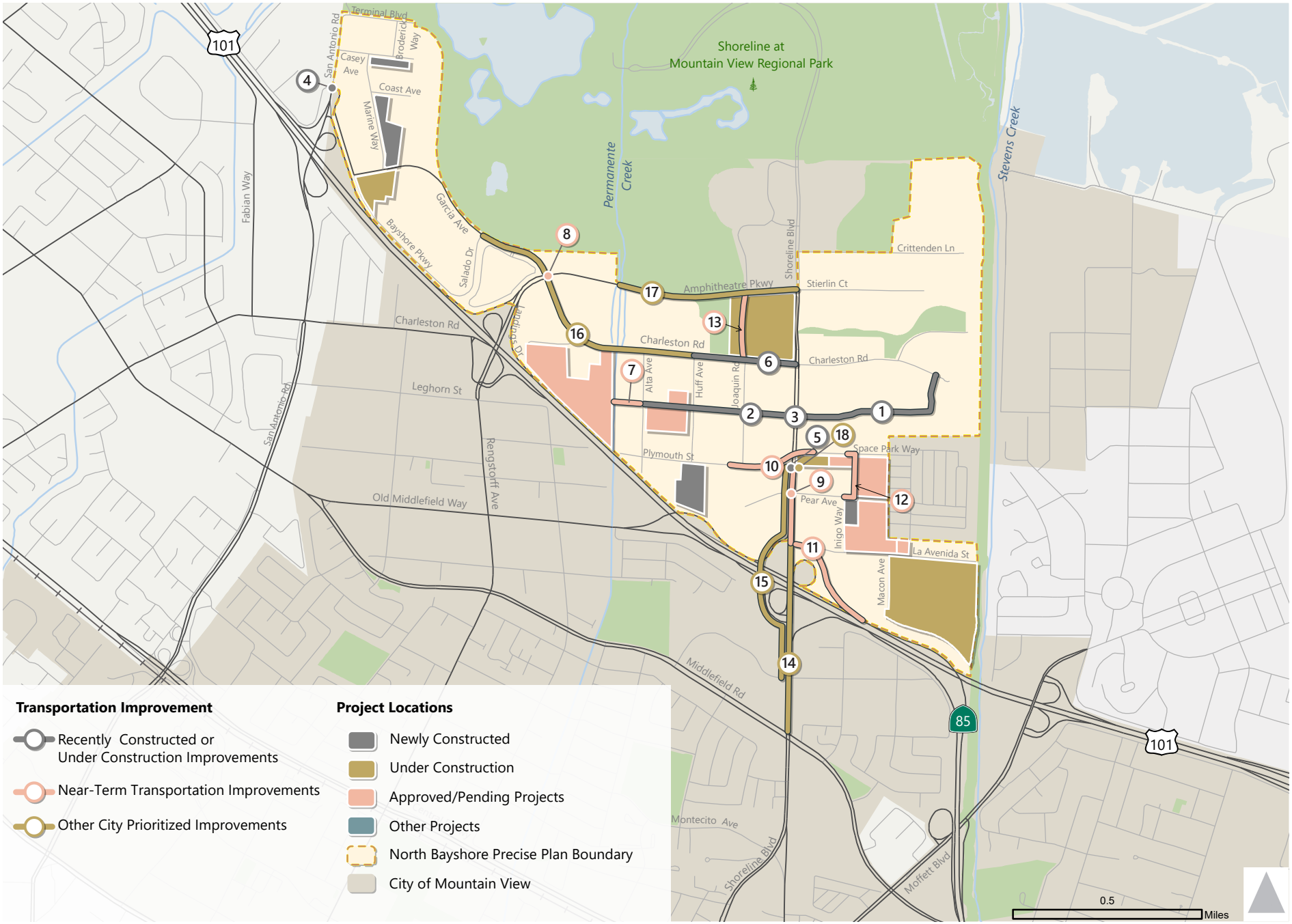


Figure 34

North Bayshore Transportation Improvement Project Map

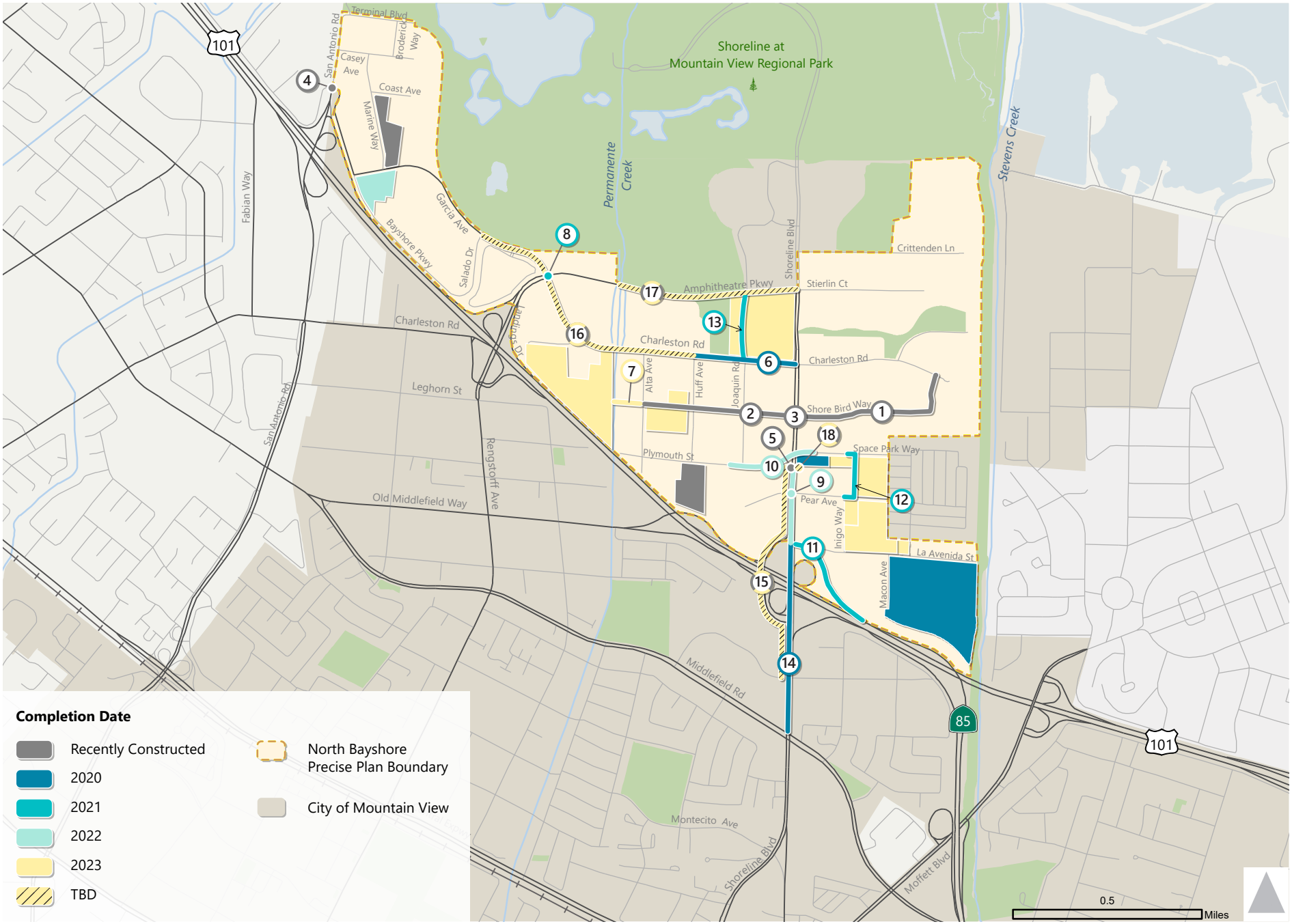


Figure 35

Near Term Growth Development Projects and North Bayshore Transportation Improvement Completion Year

Table 26: North Bayshore Transportation Improvements

ID Number	Facility	Extent of Improvement	Description of Improvement	Estimated Completion Year
Set 1: Recently Constructed or Under Construction Improvements				
1	East-West Bicycle connection	Shoreline Blvd to Stevens Creek Trail (between Charleston Rd and Plymouth St)	Buffered bicycle lanes.	Completed
2	East-West Greenway Connection #2	Alta Ave and Shoreline Boulevard (between Charleston Rd and Plymouth St)	Multiuse path.	Completed
3	Shoreline Blvd Signalized Bicycle Crossing	East-West Greenway #2 at Shoreline Blvd	Signalized bicycle crossing at Shoreline Blvd.	Completed
4	San Antonio Rd and Bayshore Pkwy	At intersection	Provide additional northbound right turn lane (240 feet) and eastbound left turn lane storage (130 feet). Reconfigure the eastbound approach with a separate left turn lane and a shared through-right turn lane. (The City implemented a modified westbound approach with a left turn lane, and a shared left-through-right lane)	Completed
5	Shoreline Boulevard and Plymouth Street	At Intersection	Signalize intersection	Completed
6	Charleston Road	Charleston Road between Huff Avenue and Shoreline Boulevard	Charleston Road Transit Corridor improvements	2020
Set 2: Near-Term Growth Conditions Improvements				
7	East-west greenway connection	Alta Avenue to Landings Office Development	Multiuse path	2023

Table 26: North Bayshore Transportation Improvements

ID Number	Facility	Extent of Improvement	Description of Improvement	Estimated Completion Year
8	Amphitheatre Pkwy and Garcia Ave-Charleston Rd	At Intersection	Signal timing modifications	2021
9	Shoreline Blvd and Pear Ave	At intersection	Construct a separate northbound right-turn lane with 300 foot storage pocket. Modify the westbound approach as a left turn lane and one shared through-right lane with east/west split phasing.	2022
10	Plymouth St Re-Alignment	At the new intersection of Shoreline Blvd and Plymouth St-Space Park Way	Re-align Plymouth St with Space Park Way with signalization and protected phasing. (Eastbound and westbound left turn and shared through-right; Northbound approach with two left-turns, one shared through-right; and southbound approach with left turn, one through, one shared through-right). The two northbound left turn lanes should be 425 feet long to minimize queue spillback during the morning peak hour.	2022
11	Shoreline Blvd / US 101 Northbound Off-Ramp	La Avenida to US 101 mainline	Re-align US 101 off-ramp to Shoreline Blvd with removal of the east leg from US 101. Creation of a new intersection of La Avenida and US 101 Northbound Ramps east of Shoreline Boulevard with two northbound left turn lanes and two northbound right turn lanes.	2021
12	Local north-south street	La Avenida and Space Park east of Shoreline Blvd	Two-lane street with bicycle lanes and sidewalks (with dog leg).	2021
13	Joaquin Rd	Charleston Rd to Amphitheatre Pkwy	Two-lane street with bicycle lanes and sidewalks.	2021
Set 3: Other City Prioritized Improvements				
14	Shoreline Boulevard Reversible Transit Lane	Pear Avenue to Middlefield Road	Center-running, reversible transit lane extending from Middlefield Avenue north to Pear Avenue.	2020
15	US 101 Bicycle and Pedestrian Path	Terra Bella Ave to Plymouth St	Multiuse path	TBD
16	Charleston Road	Salado Drive and Huff Avenue	Charleston Road Transit Corridor improvements	TBD

Table 26: North Bayshore Transportation Improvements

ID Number	Facility	Extent of Improvement	Description of Improvement	Estimated Completion Year
17	Amphitheatre Parkway	Permanente Creek Trail to Shoreline Boulevard	Amphitheatre Parkway widening from three lane street (one eastbound lane and two westbound lanes) to a four-lane street (two lanes in each direction).	TBD
18	Shoreline Boulevard and Plymouth Street	At Intersection	Add a second northbound left turn lane	TBD

Source: City of Mountain View, April 2020.

Gateway Demand and Vehicle Trip Target Summary

The seven Near-Term development projects would add about 2,082,800 square feet or about 6,800 new employees, and about 1,600 residents to the area. Additional vehicle traffic that would occur as a result of that new activity has been estimated based on an assumption that the new employees would achieve the target mode shifts through an application of an extensive TDM Program (e.g., apply most of the TDM measures listed in the *North Bayshore Transportation Demand Management TDM Plan Guidelines*, 2015) and a project driveway trip target. That additional traffic has been added to the existing counts, and then compared to the North Bayshore Precise Plan (NBPP) morning inbound peak hour trip target. If the vehicle trip target is exceeded, that would indicate that additional gateway trip reduction efforts would be needed from all users in the North Bayshore area, both existing and new, in order to change travel behavior, and/or that additional capacity might need to be added to the gateways in order to accommodate this new demand. **Figures 36** and **37** shows the vehicle demand for existing plus near-term development traffic compared to the NBPP trip cap without and with additional TDM applied to existing buildings. This estimate indicates that the two-way peak hour gateway volumes will exceed the vehicle trip caps if additional TDM is not applied to existing buildings.

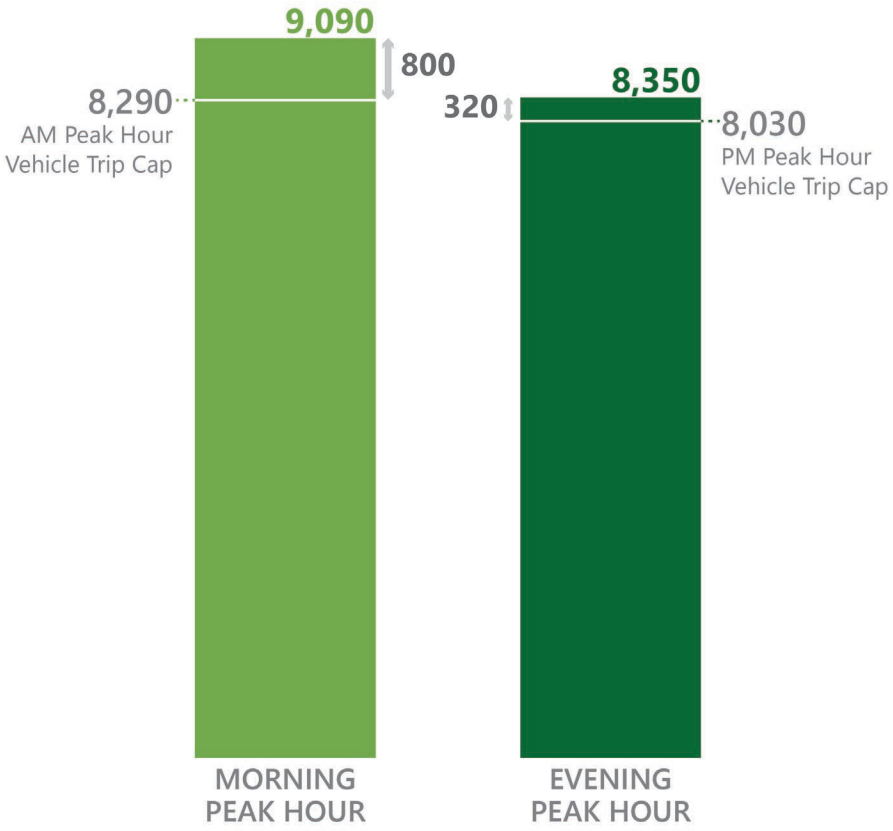


Figure 36: Two-Way Near-Term Gateway Vehicle Demand without Additional TDM Applied to Existing Buildings and Vehicle Trip Cap Comparison

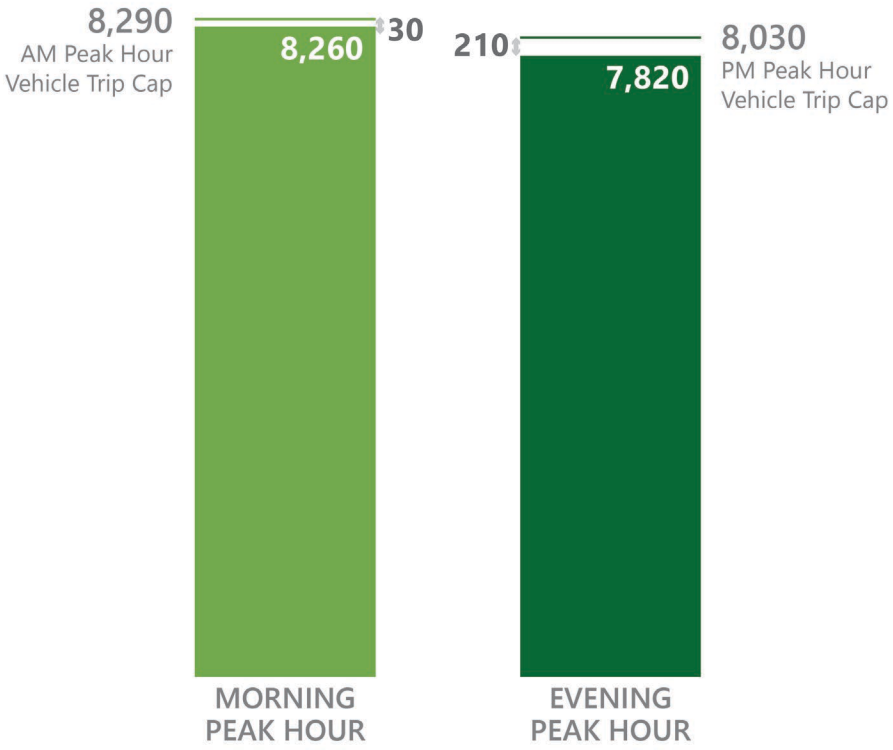


Figure 37: Two-Way Near-Term Gateway Vehicle Demand with Additional TDM Applied to Existing Buildings and Vehicle Trip Cap Comparison

The NBPP transportation framework requires more effective use of the existing physical capacity of the gateways to accommodate future development with just three gateways. The Near-Term growth assessment of the seven developments indicates that Shoreline gateway could exceed capacity if each of the gateways is not more effectively utilized. This is due to much of the Near-Term growth occurring near the Shoreline gateway. Therefore, additional NBPP transportation strategies (discussed earlier on page 54) and/or priority transportation infrastructure with vehicle capacity benefits would need to be implemented to accommodate this finding.