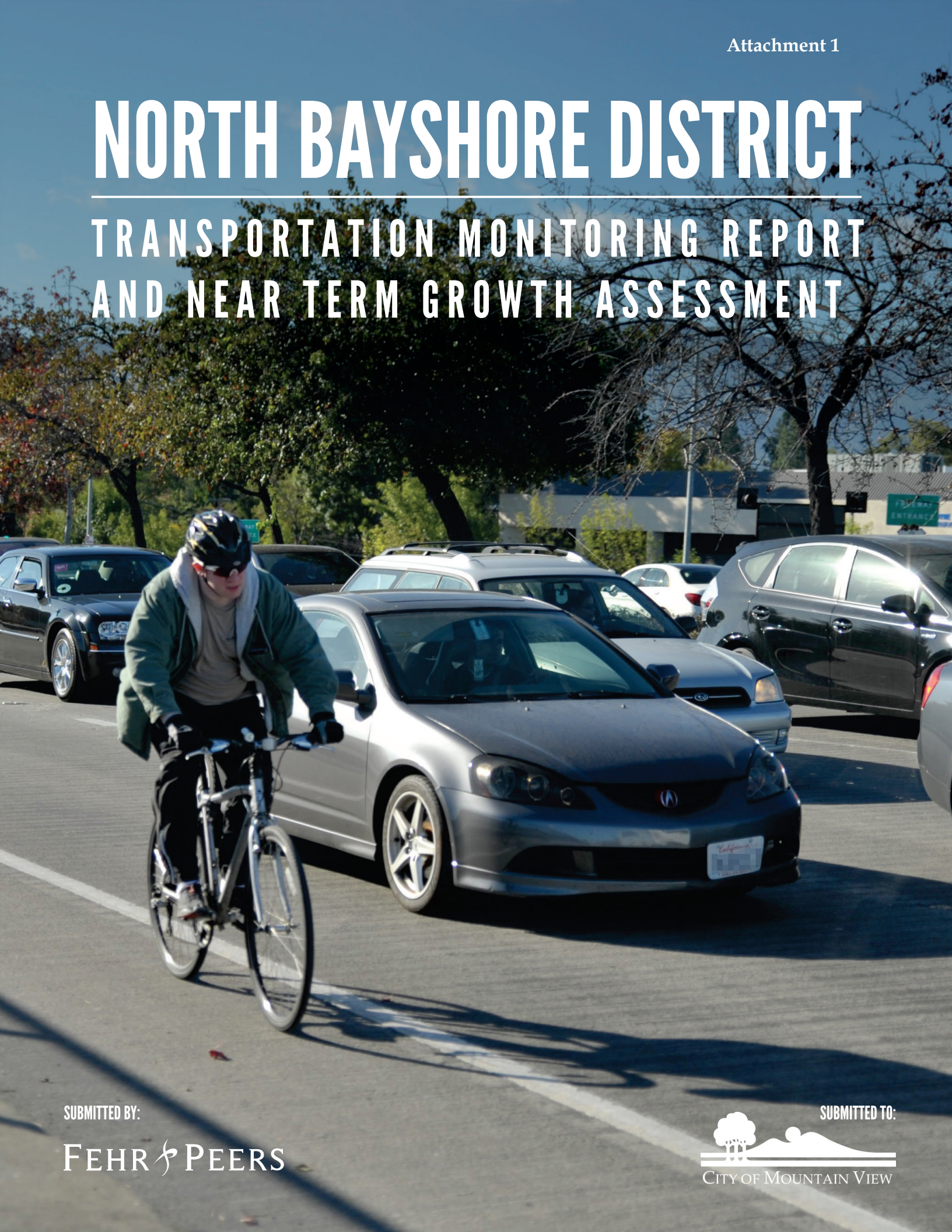
Attachment 1

# NORTH BAYSHORE DISTRICT

## TRANSPORTATION MONITORING REPORT AND NEAR TERM GROWTH ASSESSMENT



SUBMITTED BY:

FEHR & PEERS

SUBMITTED TO:

CITY OF MOUNTAIN VIEW

Final Report

# Spring 2019 North Bayshore District Transportation Monitoring and Near-Term Growth Assessment

**Prepared for:**
**City of Mountain View, California**

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FEHR & PEERS

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# Key Findings

This report summarizes the results of the Spring 2019 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 entering 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).

- **Combined Gateway Peak Hour Trip Cap Comparison**: The total traffic volumes at the three gateways combined (San Antonio Road, Rengstorff Avenue and Shoreline Boulevard) are lower than the total gateway vehicle trip targets.
- **Individual Gateway Peak Hour Trip Cap Comparison**: Each individual gateway is under its peak hour vehicle trip cap and is in compliance with the North Bayshore Gateway Peak Hour Vehicle Trip Cap Policy.
- **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 4:45 to 5:45 PM.
- **Morning Combined Gateway Mode Share**: In the morning peak hour, people enter North Bayshore using the following modes: 56% in single-occupant vehicles (SOVs), 11% in shared-ride vehicles, 31% on transit, 2% biking, and less than 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: 50% in single-occupant vehicles, 14% in shared-ride vehicles, 33% on transit, 2% biking, and 1% walking.
- **Shoreline Boulevard Peak Vehicle Volume**: The Shoreline Boulevard gateway experiences consistently high volumes between 8:30 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 9:00 to 10:00 AM that taper off quickly.
- **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 9:00 and 10:00 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 and evening peak hours, 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 eight 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.

# 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 gateway 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 in the Fall. City staff will use this North Bayshore District Transportation Monitoring report to evaluate whether current North Bayshore development and travel behavior is conforming to the vehicle trip caps. 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.

## 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.
- **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 24th and March 10th, 2019. 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**.

## 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.


Figure 1

## Existing Street System


Figure 2

## Sidewalk Gaps

## 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) Routes 40, 120, and 824 (Altamont Corridor Express (ACE) Shuttle), as well as two MVgo routes. Private shuttle services are operated by Google, Microsoft[1] 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. *Since the Fall 2018 Monitoring report, the Microsoft shuttle route was furloughed during construction of the new buildings in North Bayshore.*

**Table 1: Existing Transit Service**

| Route | From | To | Weekdays | | | Weekends | |
|---|---|---|---|---|---|---|---|
| | | | Operating Hours | Headway (minutes)[1] | | Operating Hours | Headway (minutes)[1] |
| | | | | Peak | Mid-Day | | |
| 40 | La Avenida / Inigo Way | Foothill College | 6:12 AM to 10:05 PM | 25 to 30 | 30 | 7:49 AM to 6:15 PM | 45 to 60 |
| 120 | Fremont BART[2] | Lockheed Martin Transit Center / Moffett Park | 6:16 AM to 9:30 AM | 15 to 30 | N/A | No Weekend Service | |
| ACE Orange (824) | East Meadow Drive / Meadow Circle | Great America Station | 6:16 AM to 9:51 AM<br>2:56 PM to 6:39 PM | 30 to 60 | N/A | No Weekend Service | |
| West Bayshore MVgo | Downtown Mountain View Transit Center | Casey Ave / Intuit Main Street | 6:45 AM to 10:41 AM<br>3:32 PM to 8:08 PM | 15 to 20 | N/A | No Weekend Service | |
| East Bayshore MVgo | Downtown Mountain View Transit Center | Crittenden Lane | 7:14 AM to 10:18 AM<br>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.
2. BART = Bay Area Rapid Transit
Source: VTA, ACE and MVgo, 2019.

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

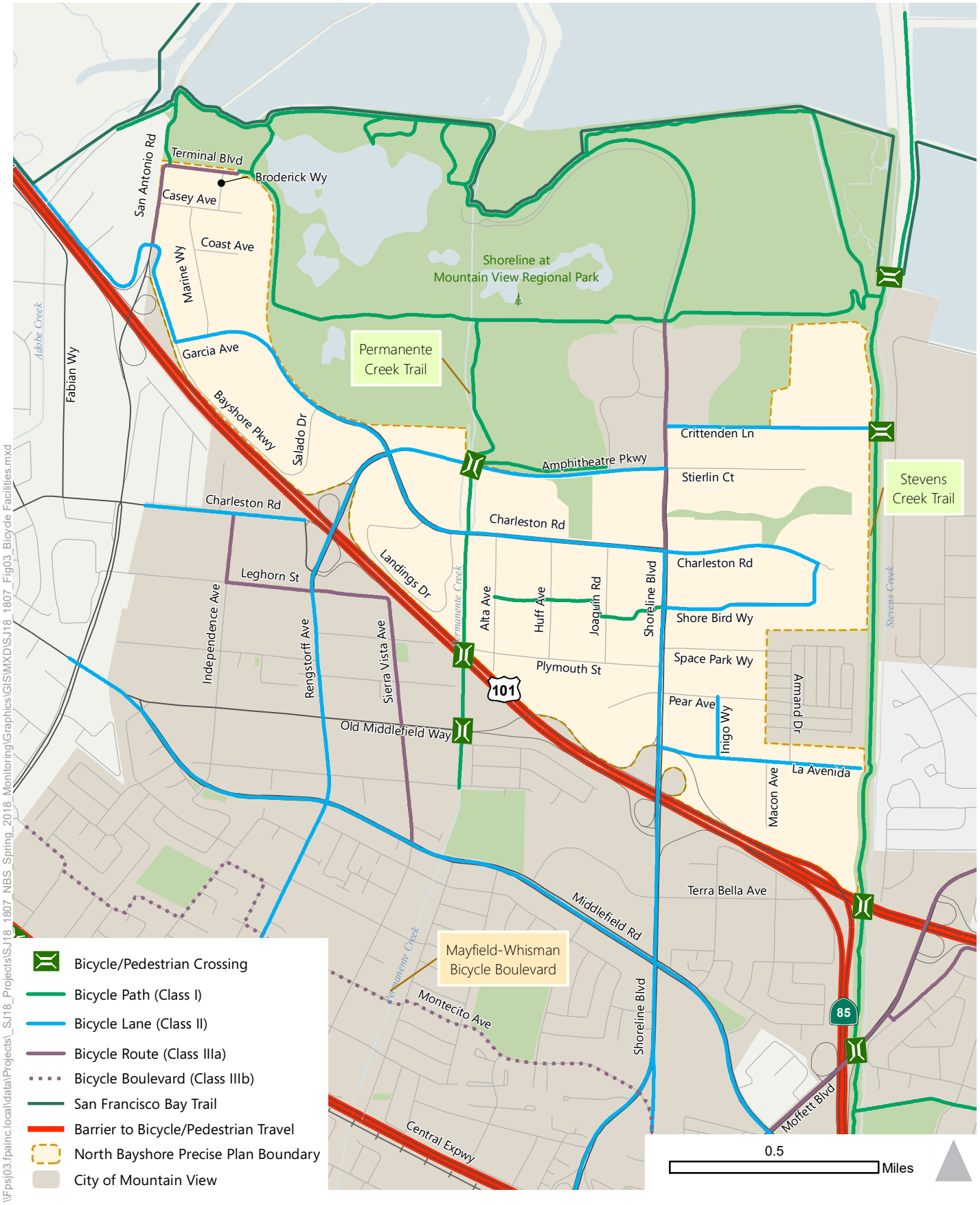


Figure 3

## Existing Bicycle Facilities


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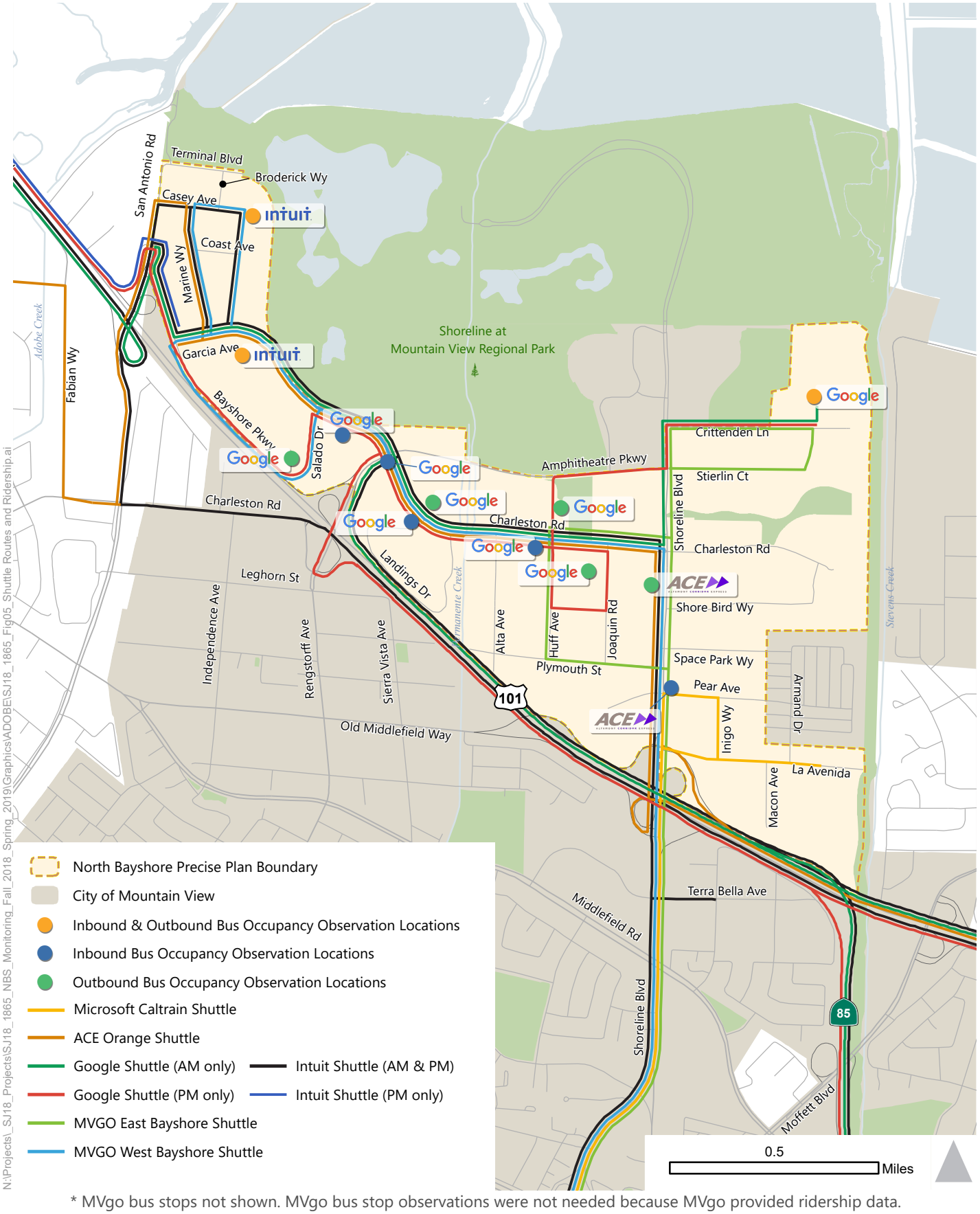
Figure 4

## Existing Transit Service

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

Figure 5

## Shuttle Routes and Ridership Data Collection Locations

# 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; 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 2019 Gateway Vehicle Volumes**

| Gateway | Morning | | | Evening | | |
|---|---|---|---|---|---|---|
| | Inbound | Outbound | Total | Inbound | Outbound | Total |
| ***Peak Hour*** | | | | | | |
| San Antonio Road | 1,280 | 190 | 1,470 | 190 | 800 | 990 |
| Rengstorff Avenue | 2,400 | 380 | 2,780 | 420 | 1,860 | 2,280 |
| Shoreline Boulevard | 2,270 | 610 | 2,880 | 640 | 2,340 | 2,980 |
| **Total** | **5,950** | **1,180** | **7,130** | **1,250** | **5,000** | **6,250** |
| ***3-Hour Peak Period*** | | | | | | |
| San Antonio Road | 2,930 | 610 | 3,540 | 550 | 1,940 | 2,490 |
| Rengstorff Avenue | 5,970 | 1,120 | 7,090 | 1,240 | 4,810 | 6,050 |
| Shoreline Boulevard | 6,440 | 1,870 | 8,310 | 2,050 | 6,300 | 8,360 |
| **Total** | **15,340** | **3,600** | **18,940** | **3,840** | **13,050** | **16,900** |

Source: Fehr & Peers, 2019.

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 Shoreline Boulevard and Rengstorff Avenue gateways during the morning peak hour, the two-way day-to-day variation is less than +/- 6 percent, while the San Antonio Road gateway day-to-day variation is less than +/- 8 percent during the morning peak hour. The combined gateways day-to-day variation during the morning peak hour is +/- 2 percent. In the evening, the day-to-day variation is +/- 3 percent across the combined gateways. The variation in peak period data follows a similar pattern. 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 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.

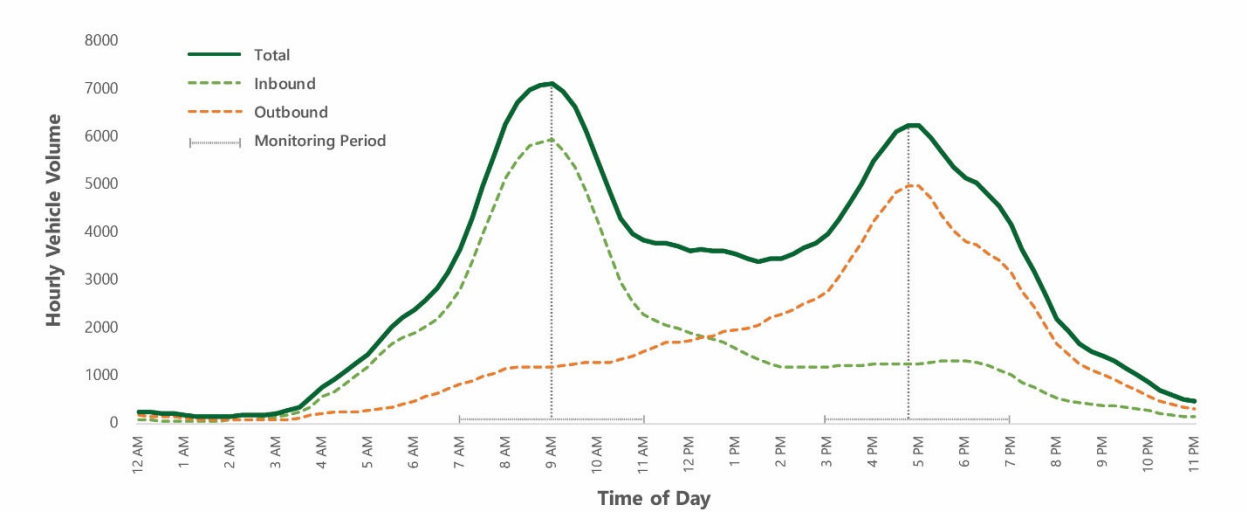



*Figure 7: Existing Vehicle Traffic Patterns by Time of Day for All Gateways Combined*

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 (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 4:45 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.

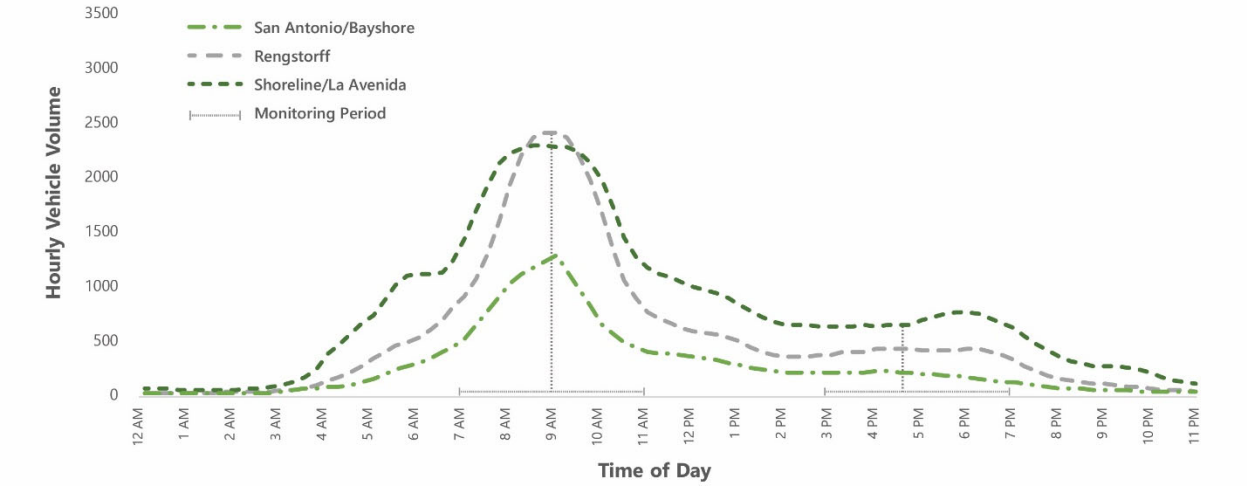



*Figure 8: Existing Inbound Vehicle Traffic Patterns by Time of Day for Each Gateway*

**Figure 8** above presents only inbound usage at each of the three gateways. Shoreline Boulevard has a relatively flat profile during a portion (8:00 AM to 9:30 AM) of the morning peak period, 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 8:00 AM, and continue to operate at approximately that capacity until around 9:30 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 a greater morning inbound peak hour volume than Shoreline Boulevard and San Antonio Road gateways.

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.

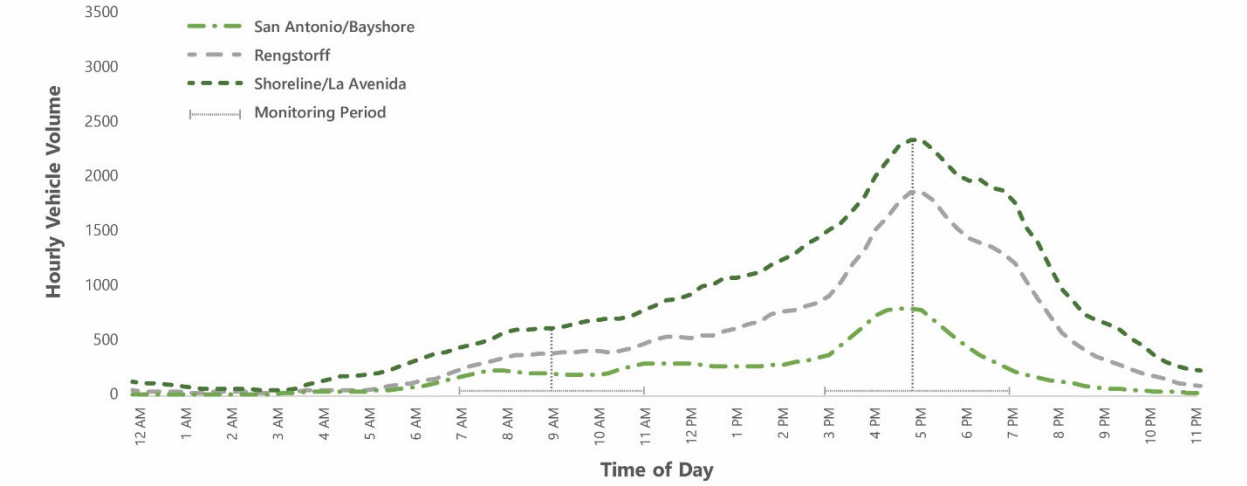



*Figure 9: Existing Outbound Vehicle Traffic Patterns by Time of Day for Each Gateway*

**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.

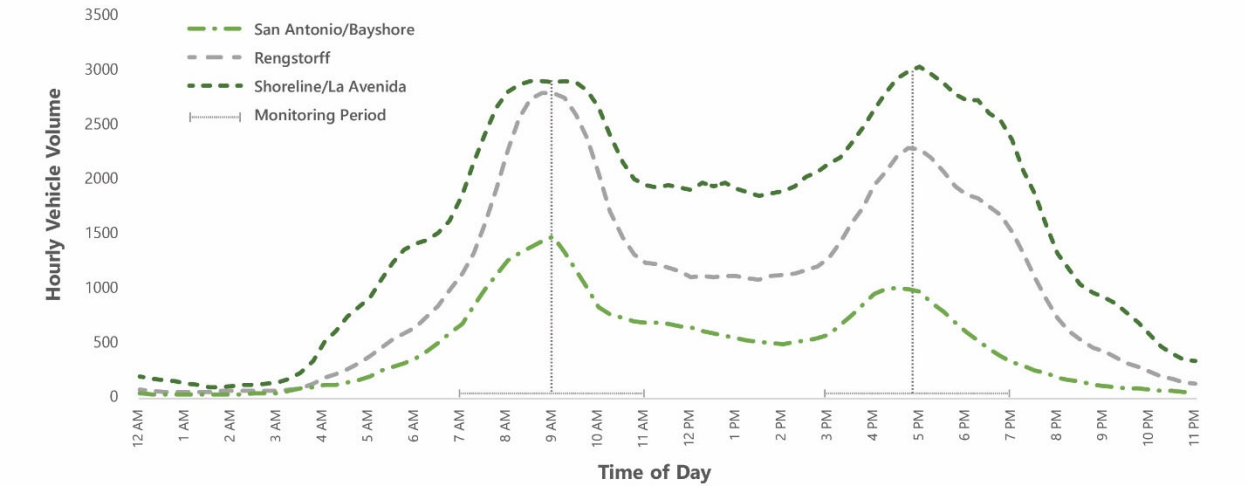
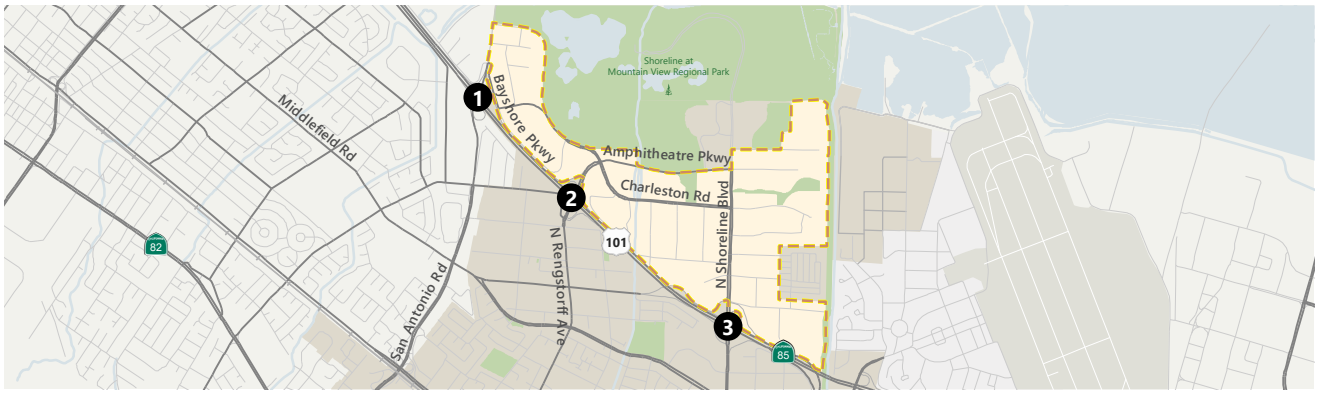
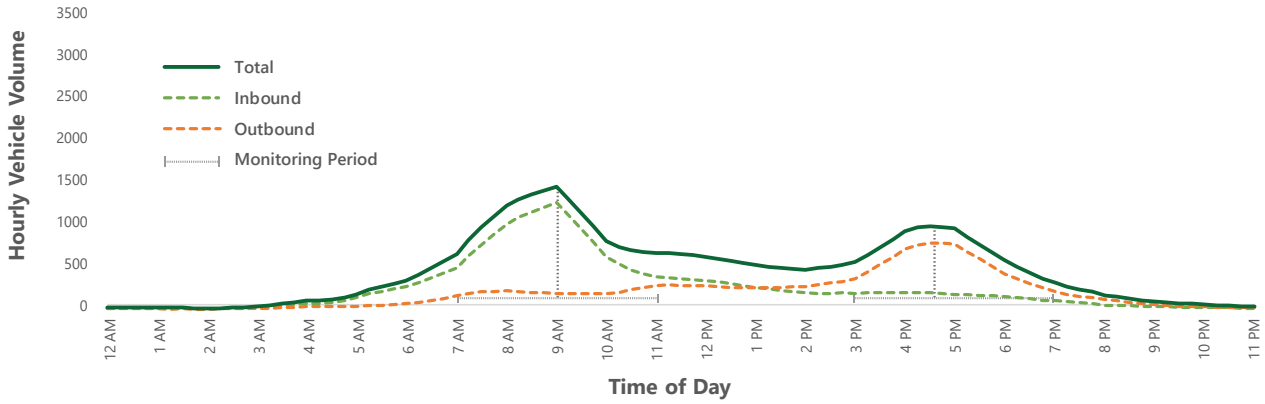



*Figure 10: Existing Inbound and Outbound Vehicle Traffic Patterns by Time of Day for Each Gateway*

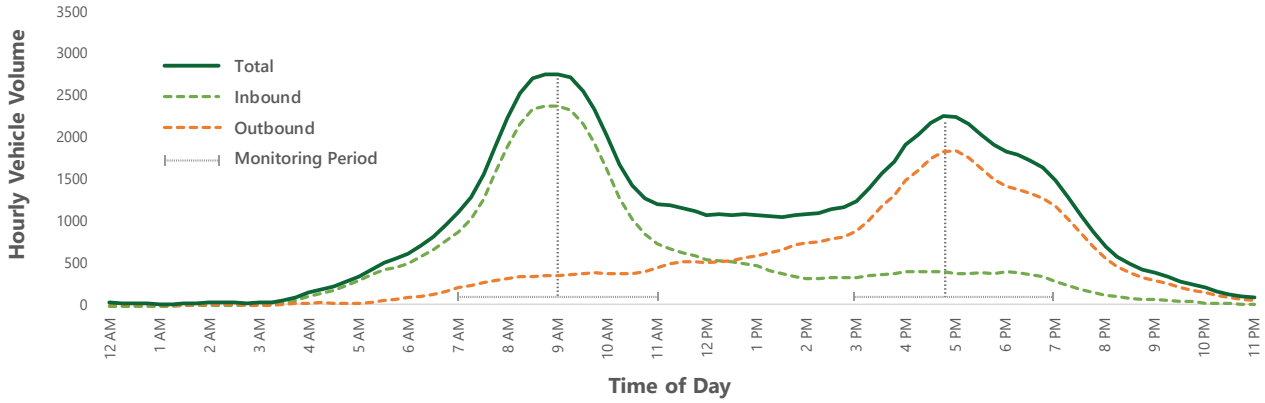
Similar information for each gateway individually is shown in **Figure 11**. As described previously, San Antonio Road is the most lightly used of the three gateways. Shoreline Boulevard and Rengstorff Avenue have similar peak traffic usage during the morning, although Shoreline carries more total vehicles 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

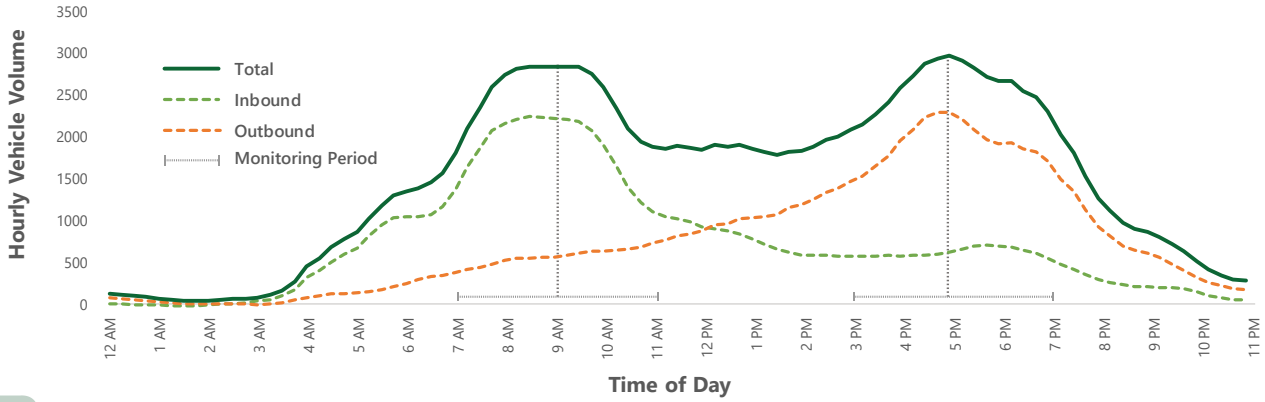



Figure 11

# Gateway Inbound and Outbound Vehicle Traffic Patterns by Time of Day

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## 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 (4:45 to 5:45 PM). Tables with data for **Figures 12-18** are included in **Appendix C** and **Appendix D**.

***All Gateways Combined[2]***

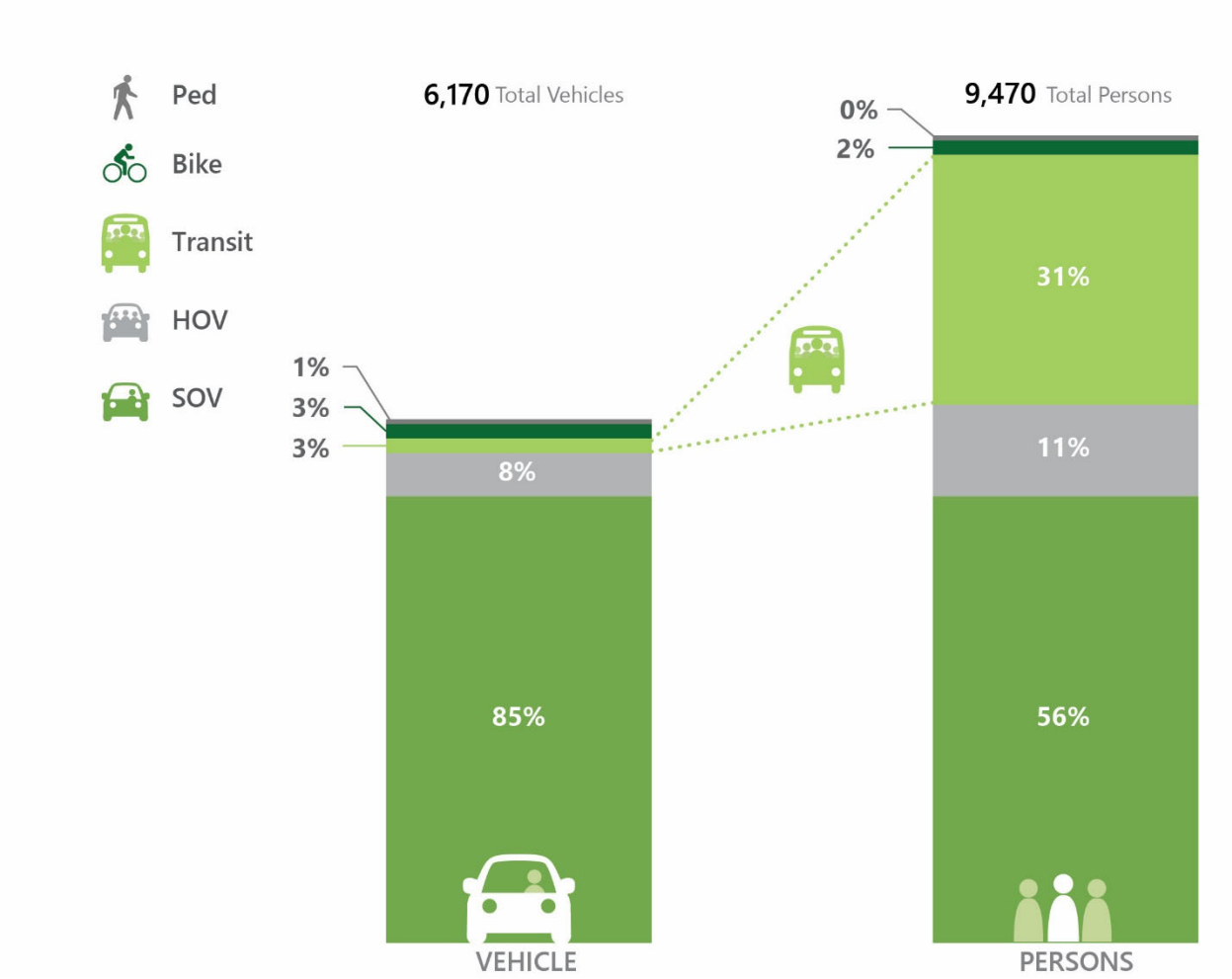



*Figure 12: Existing Morning Inbound Peak Hour Mode Share for Vehicles and Persons*

As shown on **Figure 12**, most vehicles (85%) entering North Bayshore during the morning peak hour are SOVs; these vehicles transport 56% of people who enter the area. An additional 11% of people arrive using carpools. 31% of commuters use public transit and shuttles, which make up only 3% of the total number of vehicles entering the area, 2% of commuters bike, and less than 1% walk.

As shown on **Figure 13** 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

[2] Transportation network companies (TNC) (e.g., Uber, Lyft, etc.) were observed 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). Detailed TNC vehicle occupancy counts are provided in Appendix C.

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.

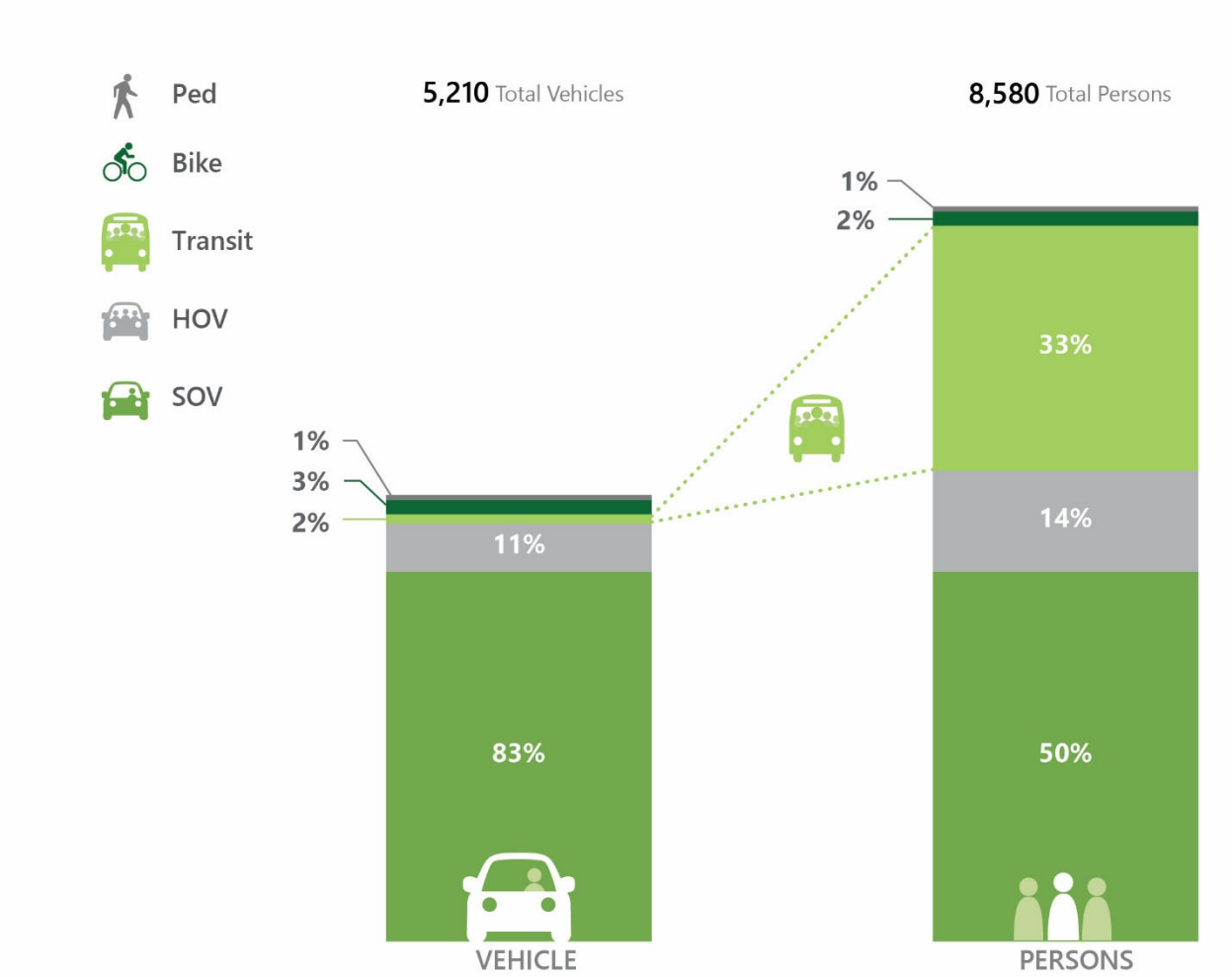



*Figure 13: Existing Evening Outbound Peak Hour Mode Share for Vehicles and Persons*

***By Gateway***

Each gateway has a different mix of users during the morning peak hour. **Figure 14** 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 14: Existing Inbound Morning Peak Hour Persons by Gateway*

**Figure 15** 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[3]). 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 39% of them while Rengstorff Avenue carries 41%.

[3] TNC mode share is included in HOV mode share percentage.

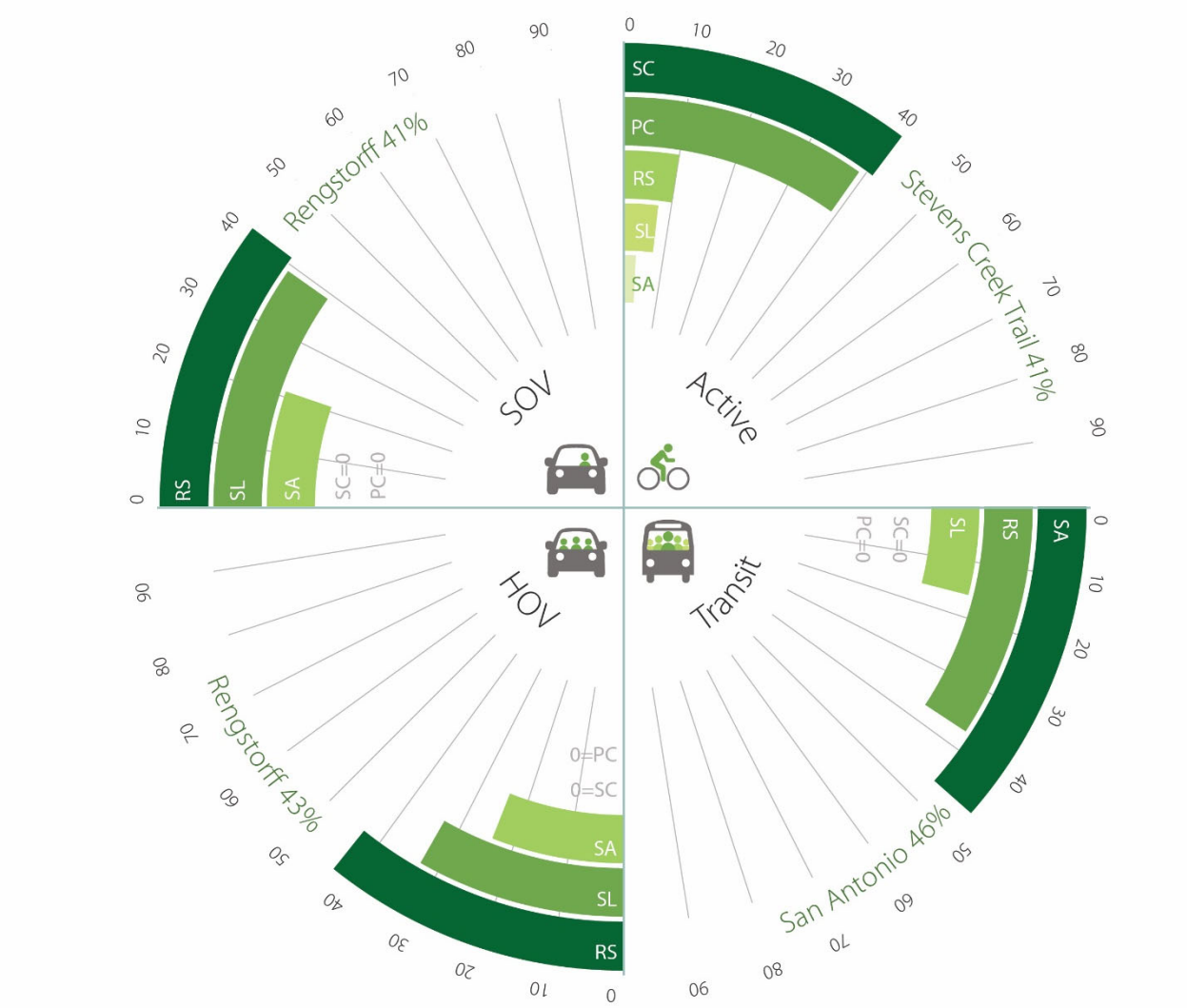



*Figure 15: Existing Portion of Inbound Morning Peak Hour Persons by Gateway*

Most active mode users (80%) 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 84% of inbound transit riders, while Shoreline Boulevard carries 16%. 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 16** 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.

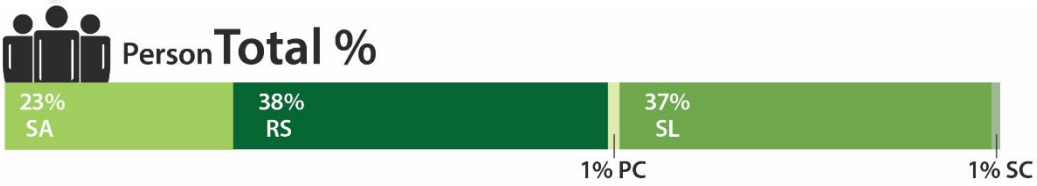



*Figure 16: Existing Outbound Evening Peak Hour Persons by Gateway*

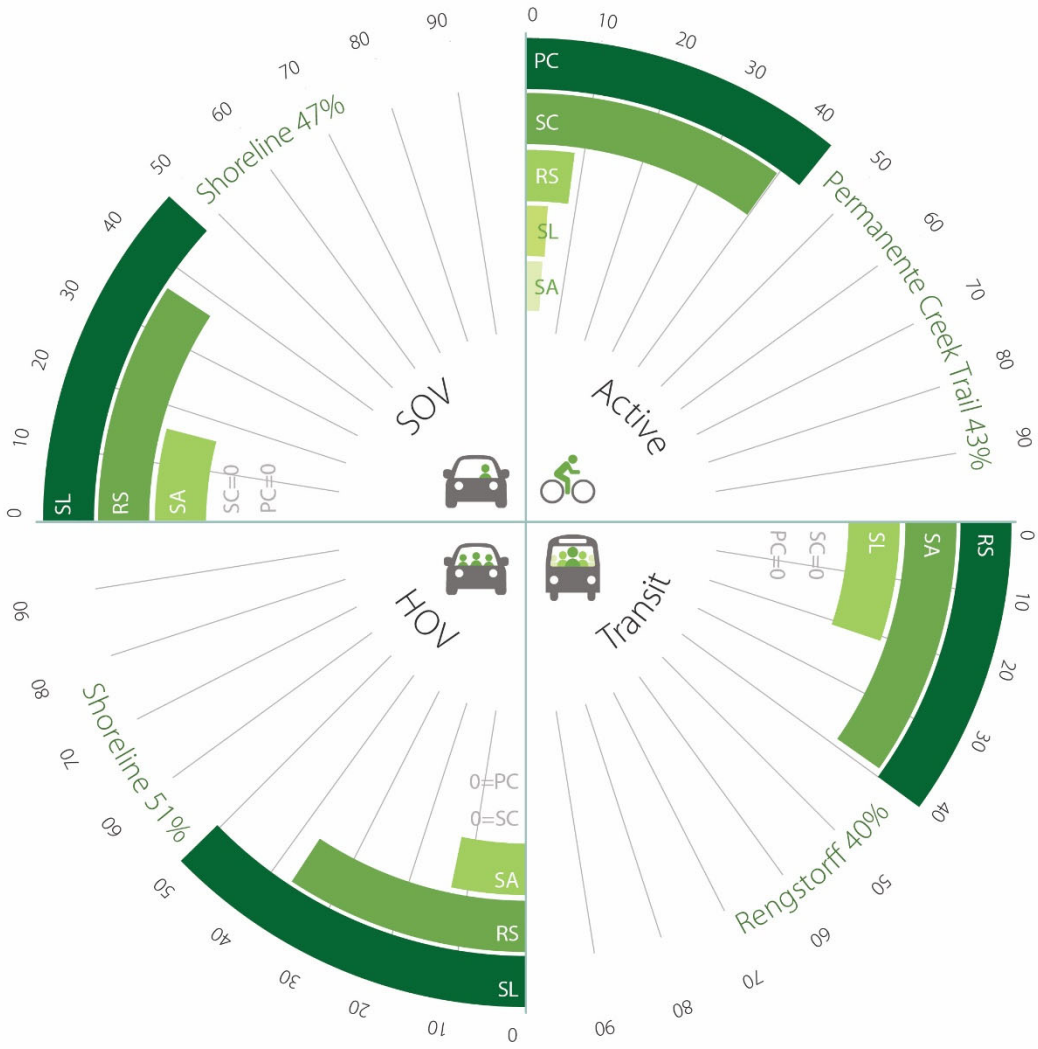



*Figure 17: Existing Portion of Outbound Evening Peak Hour Persons by Gateway*

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 79% of outbound transit riders, while Shoreline Boulevard carries 21%.

### 3-Hour Peak Period Mode Share

The same type of mode share analysis was conducted for the morning and evening 3-hour peak period. The only notable differences were:

- Transit riders are more evenly distributed across the gateways during the morning and evening 3-hour peak periods compared to the peak hours.
- During the morning peak hour, Rengstorff Avenue carries 10% more HOVs than Shoreline Boulevard. However, during the morning 3-hour peak period there is an even split of HOVs between Rengstorff Avenue (38%) and Shoreline Boulevard (39%).

For informational purposes, **Figure 18** below presents the morning and evening 3-hour peak period mode split information adjacent to the peak hour mode split information.

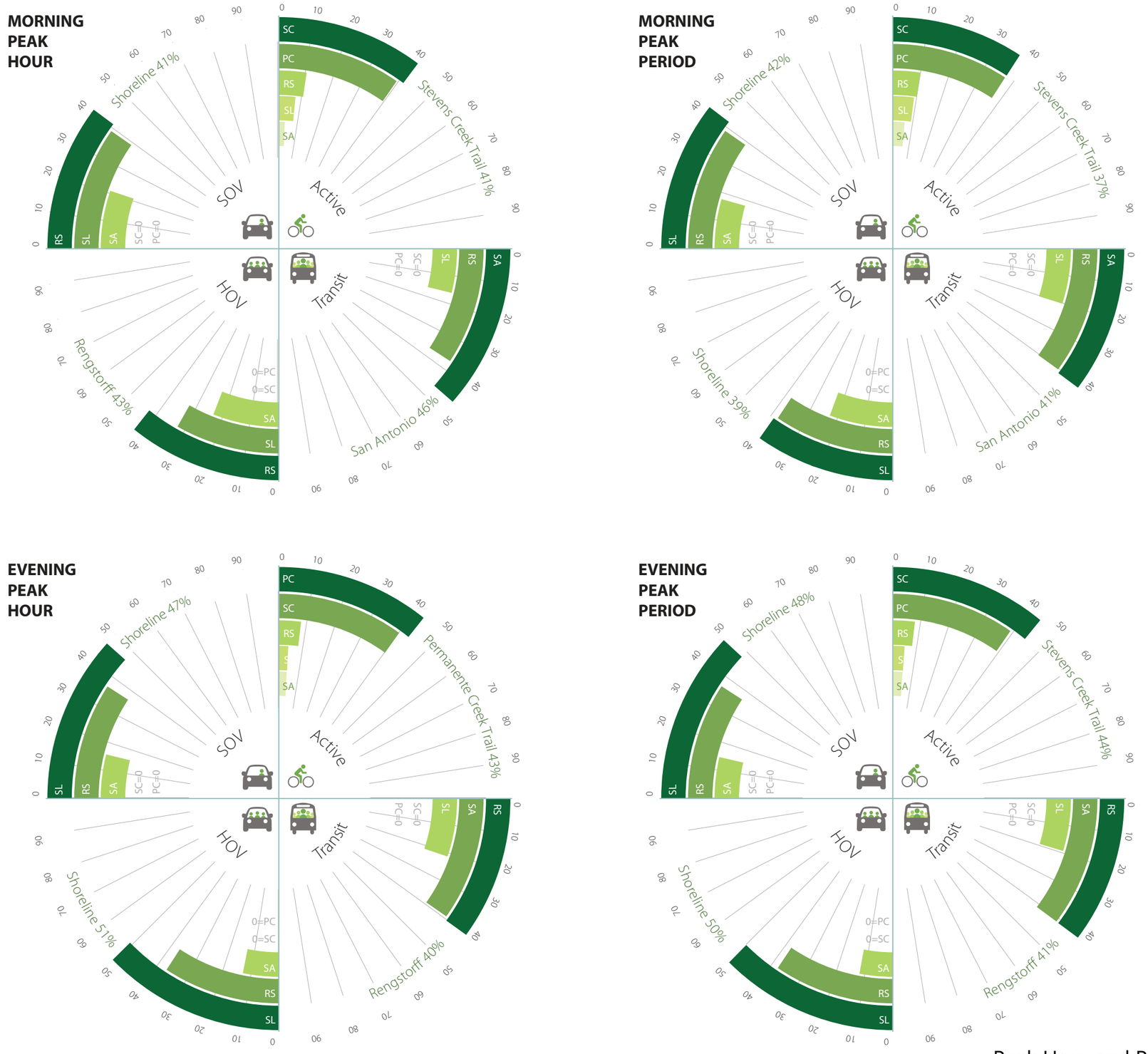



Figure 18

Peak Hour and Peak Period Persons By Gateway

# 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 19** to **23** 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 19** and **20** below present inbound volume data for the morning peak hour and 3-hour peak period.

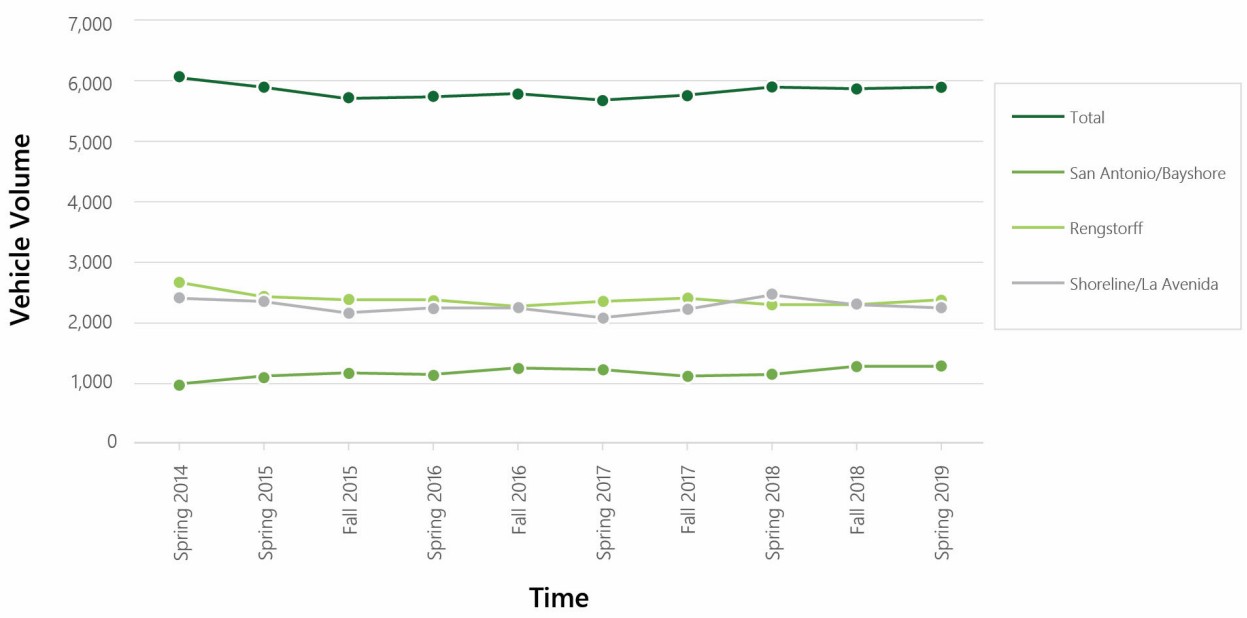



*Figure 19: Morning Peak Hour Inbound Vehicle Volumes Over Time*

As shown on **Figure 19**, the morning peak hour inbound vehicle volume over time remains relatively flat, starting at 6,100 vehicles in Spring 2014 and ending with 5,950 vehicles in Spring 2019. With slight variations, peak hour volumes at each gateway have been relatively consistent over the past three years. In this monitoring cycle, Rengstorff Avenue carries more vehicles than Shoreline Boulevard.

**Figure 20** illustrates 3-hour peak period inbound vehicle volume over time. As shown in **Figure 20**, there has been an increase in inbound 3-hour peak period volumes since Spring 2017, with the most change occurring at Rengstorff Avenue and Shoreline Boulevard. Volumes on San Antonio Road have remained very consistent.

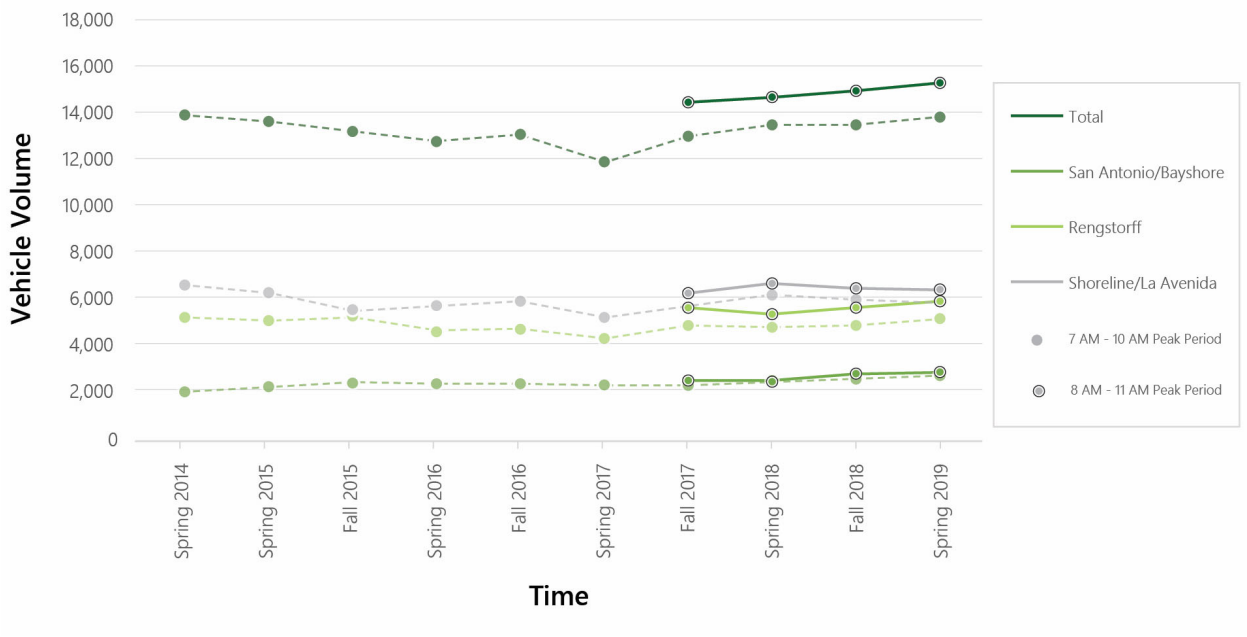



*Figure 20: Morning 3-Hour Peak Period Inbound Vehicle Volumes Over Time*

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 20**, 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 2019, the current 3-hour peak period volume is 9% 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 21** and **22** below present mode share results for the inbound morning peak hour and 3-hour peak period.

### Inbound Morning Peak Hour

**Figure 21** below shows the person mode share for the morning inbound peak hour since Spring 2014. The mode shares are at very similar levels in Spring 2014 and Spring 2019, although they fluctuated slightly during the intervening years, when there was a decrease in transit trips and an increase in SOV and active trips (particularly in Spring 2016). The inbound morning peak hour SOV mode share has increased slightly from 51% in Spring 2014 to 56% in Spring 2019. Beginning with this monitoring 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). The other modes have a similar trend of nearly identical mode split between Spring 2014 and Spring 2019. The percent mode split for each year is described in **Appendix C**.

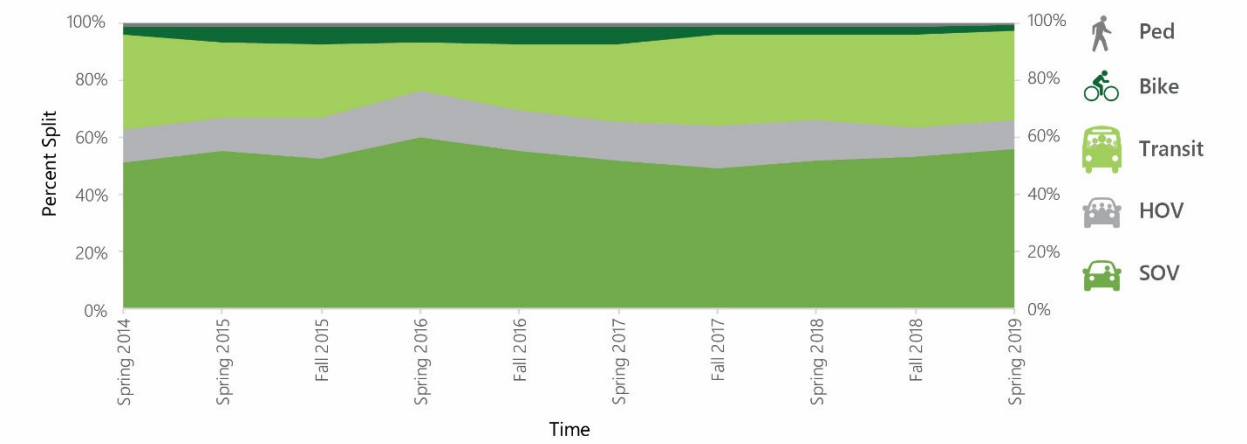



*Figure 21: Inbound Morning Peak Hour Person Mode Split Over Time*[4]

## Inbound Morning 3-Hour Peak Period

**Figure 22** 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, SOV mode share has remained relatively consistent (58% in both Spring 2014 and Spring 2019). However, the Transit mode share increased slightly from 25% in Spring 2014 to 28% in Spring 2018. The other modes have a similar trend of nearly identical mode split between Spring 2014 and Spring 2019. The percent mode split for each year is described in **Appendix C.**

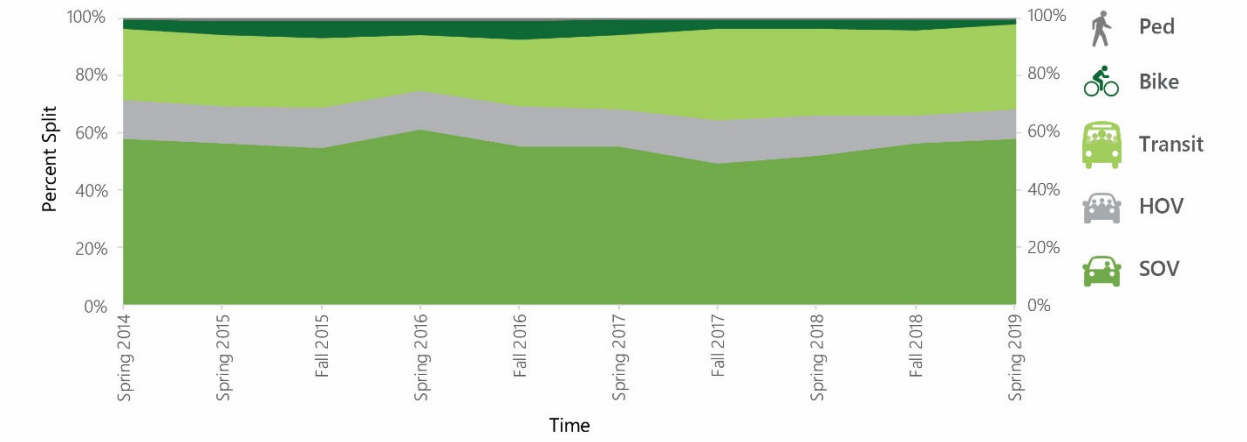



*Figure 22: Inbound Morning 3-Hour Peak Period Person Mode Split Over Time*[5]

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.

[4] TNC volume was added to HOV mode share in this Figure.
[5] TNC mode share was added to HOV mode share.

**Figure 23** shows the mode split historical trend from 8:00 AM to 11:00 AM for Fall 2017, Spring 2018, Fall 2018, and Spring 2019.

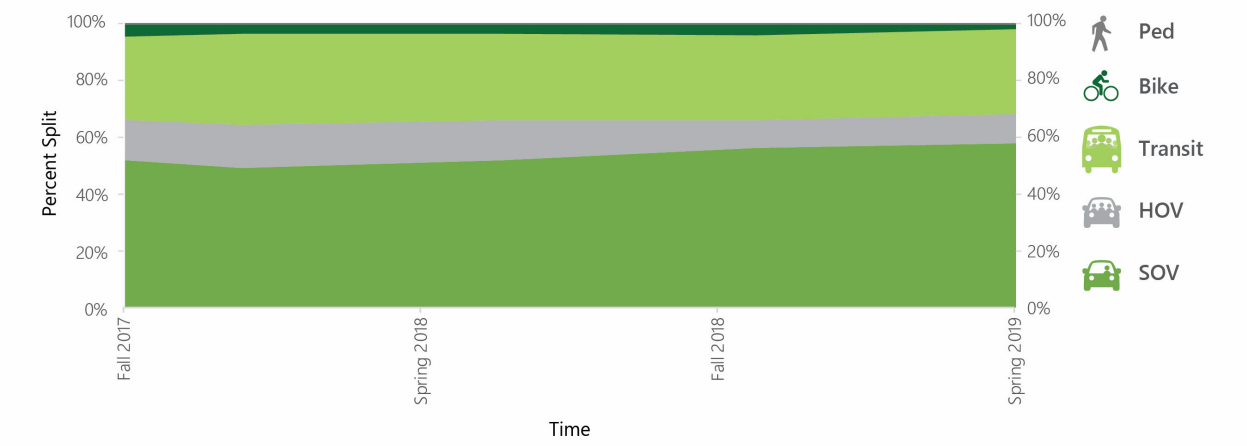



*Figure 23: Inbound Morning 3-Hour Peak Period Person Mode Split Over Time*[6]

# 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 24** 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.

[6] TNC mode share was added to HOV mode share.

**Table 3: Inbound and Outbound Queuing Observation Summary**

| Gateway | Queue Location[1] | Spring 2019 | | | Spring 2018 | | |
|---|---|---|---|---|---|---|---|
| | | 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) | 8:30 AM | 10:00 AM | 1,200 feet* (48 vehicles) | 9:00 AM | 10:00 AM | 1,040 feet (42 vehicles) |
| | NB US-101 Off-Ramp | 8:30 AM | 10:20 AM | 950 feet* (38 vehicles) | 9:05 AM | 10:00 AM | 1,070 feet* (43 vehicles) |
| Shoreline Boulevard | Northbound on Shoreline Boulevard (bridge over US-101) | 7:20 AM | 10:30 AM | 1,450 feet (58 vehicles) | 7:35 AM | 10:00 AM | 1,450 feet (58 vehicles) |
| | NB US-101 Off Ramp | 7:05 AM | 10:45 AM | 1,380 feet* (55 vehicles) | 7:00 AM | 10:20 AM | 1,670 feet* (67 vehicles) |
| ***Evening Outbound Direction*** | | | | | | | |
| Rengstorff Avenue | Eastbound on Garcia Avenue | 4:00 PM | 6:15 PM | 1,230 feet* (49 vehicles) | 4:40 PM | 6:00 PM | 1,560 feet (62 vehicles) |
| | Southbound on Amphitheatre Parkway | 4:45 PM | 6:35 PM | 760 feet (30 vehicles) | 5:05 PM | N/A[3] | 260 feet (10 vehicles) |
| | Westbound on Charleston Road | 4:55 PM | 5:50 PM | 1,000 feet (40 vehicles) | 4:55 PM | 5:50 PM | 890 feet (36 vehicles) |
| Shoreline Boulevard | Westbound on La Avenida Street | 3:20 PM | 7:20 PM | 520 feet (21 vehicles) | 4:00 PM | N/A[3] | 380 feet (15 vehicles) |
| | Southbound on Shoreline Boulevard | 3:00 PM | N/A[3] | 2,110 feet (84 vehicles) | 3:00 PM | 6:50 PM | 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).

Source: Fehr & Peers, April 2019.

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 2018 monitoring results, the

northbound queue lengths on Shoreline Boulevard have not changed during the morning peak period, as the inbound AM vehicle volume at this gateway has not changed notably since last monitored in Spring 2018. During the morning inbound peak period, the estimated maximum queue length on northbound Shoreline Boulevard is about 1,450 feet. Likewise, since Spring 2018, no notable changes have been observed in the southbound queues on Shoreline Boulevard during the evening peak period. However, the queue lengths on westbound La Avenida have grown from 380 feet in Spring 2018 to 520 feet in 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 2018 monitoring, the queue lengths on westbound Charleston Road have grown from 890 feet to 1000 feet. In addition, the queue lengths on southbound Amphitheatre Parkway have increased from 260 feet in Spring 2018 to 760 feet in Spring 2019. 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.


Figure 24

# 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.

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. Also, 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.

# 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).

# 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 6** presents the results for the morning and evening peak hours, which is the focus of the NBPP policy. For informational purposes, **Figure 25** presents the morning and evening peak hour combined gateway results, which shows available capacity across all gateways combined. **Table 6** shows available capacity at each of the gateways (i.e., San Antonio, Rengstorff and Shoreline).

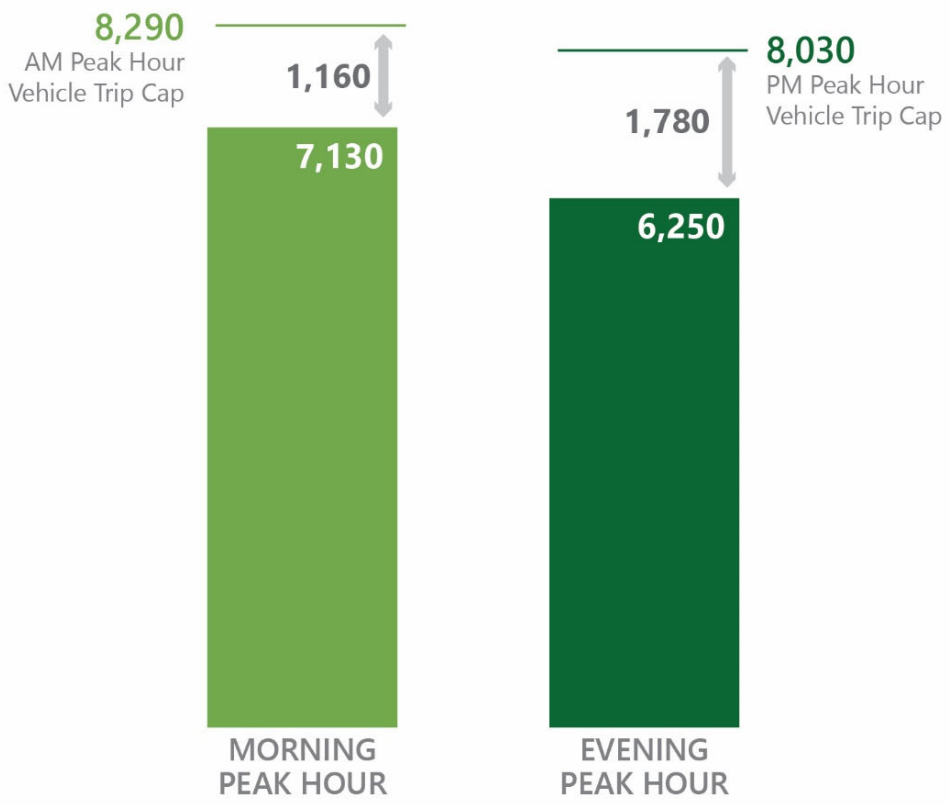



*Figure 25: Two-Way Peak Hour Gateway Vehicle Trip Cap Comparison*

**Table 6: Gateway Trip Target Evaluation _ Two-Way Peak Hour**

| Gateway | Morning | | | | Evening | | | |
|---|---|---|---|---|---|---|---|---|
| | Spring 2019 Volume | Target | Remaining Gateway Capacity | Percent of Gateway Capacity Remaining | Spring 2019 Volume | Target | Remaining Gateway Capacity | Percent of Gateway Capacity Remaining |
| San Antonio Road | 1,470 | 1,890 | 420 | 22% | 990 | 1,830 | 840 | 46% |
| Rengstorff Avenue | 2,780 | 3,290 | 510 | 15% | 2,280 | 2,440 | 160 | 7% |
| Shoreline Boulevard | 2,880 | 3,110 | 230 | 7% | 2,980 | 3,760 | 780 | 21% |
| **Total** | **7,130** | **8,290** | **1,160** | **14%** | **6,250** | **8,030** | **1,780** | **22%** |

Notes:
1. Volumes rounded to nearest 10.
2. Target = 2017 NBPP vehicle trip target = two-way peak hour.
Source: Fehr & Peers, 2019.

From **Figure 25** and **Table 6**, all gateways currently have less traffic than their vehicle trip caps in both the morning and evening peak hours. It should be noted that the Spring 2019 monitoring was conducted while several future development sites, such as Microsoft and portions of Shoreline Commons, 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 6**, during the morning peak hour, the San Antonio Road Gateway has about 22% of its vehicle trip cap remaining, the Rengstorff Avenue Gateway around 15%, and the Shoreline Boulevard Gateway around 7%. During the afternoon peak hour, the San Antonio Road Gateway has about 46% of its vehicle trip cap remaining, the Rengstorff Avenue Gateway around 7%, and the Shoreline Boulevard Gateway around 21%. This data indicates that the current level of vehicular usage at all three gateways complies with the NBPP trip cap policy during both the morning and evening peak hours.

# Potential Alternative Trip Targets

As described above, 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 2019 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 7**)
- Directional Peak Hour: Inbound morning peak hour and outbound evening peak hour using the 2014 NBPP gateway capacity estimates (see **Table 8**). *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 9**). *Note that this target would need to be periodically adjusted as residential uses are added to NBS.*

In almost all cases, the Spring 2019 observations fall below the alternative targets, typically by about 15 to 20 percent overall. The alternatives presented in these three tables are for informational purposes, and do not reflect the actual 2017 NBPP trip target policy.

## Table 7: Alternative Trip Target – Two-Way Peak Period

| Gateway | Morning | | | | Evening | | | |
|---|---|---|---|---|---|---|---|---|
| | Spring 2019 Volume | Target | Remaining Gateway Capacity | Percent of Gateway Capacity Remaining | Spring 2019 Volume | Target | Remaining Gateway Capacity | Percent of Gateway Capacity Remaining |
| San Antonio Road | 3,540 | 5,110 | 1,570 | 31% | 2,490 | 4,950 | 2,460 | 50% |
| Rengstorff Avenue | 7,090 | 8,880 | 1,790 | 20% | 6,050 | 6,590 | 540 | 8% |
| Shoreline Boulevard | 8,310 | 8,390 | 80 | 1% | 8,360 | 10,160 | 1,800 | 18% |
| **Total** | **18,940** | **22,390** | **3,440** | **15%** | **16,900** | **21,700** | **4,800** | **22%** |

Notes:
1. Volumes rounded to nearest 10.
2. Target = 2017 NBPP vehicle trip target = two-way peak hour.
Source: Fehr & Peers, 2019.

## Table 8: Alternative Trip Target – Directional Peak Hour

| Gateway | Morning | | | | Evening | | | |
|---|---|---|---|---|---|---|---|---|
| | Spring 2019 Volume | Target | Remaining Gateway Capacity | Percent of Gateway Capacity Remaining | Spring 2019 Volume | Target | Remaining Gateway Capacity | Percent of Gateway Capacity Remaining |
| San Antonio Road | 1,280 | 1,530 | 250 | 16% | 800 | 1,340 | 540 | 40% |
| Rengstorff Avenue | 2,400 | 2,960 | 560 | 19% | 1,860 | 2,090 | 230 | 11% |
| Shoreline Boulevard | 2,270 | 2,490 | 220 | 9% | 2,340 | 2,730 | 390 | 14% |
| **Total** | **5,950** | **6,980** | **1,030** | **15%** | **5,000** | **6,160** | **1,160** | **19%** |

Notes:
1. Volumes rounded to nearest 10.
2. Morning Target = Inbound morning peak hour; Evening Target = Outbound evening peak hour.
Source: Fehr & Peers, 2019.

## Table 9: Alternative Trip Target – Directional Peak Period

| Gateway | Morning | | | | Evening | | | |
|---|---|---|---|---|---|---|---|---|
| | Spring 2019 Volume | Target | Remaining Gateway Capacity | Percent of Gateway Capacity Remaining | Spring 2019 Volume | Target | Remaining Gateway Capacity | Percent of Gateway Capacity Remaining |
| San Antonio Road | 2,930 | 4,140 | 1,210 | 29% | 1,940 | 3,620 | 1,680 | 46% |
| Rengstorff Avenue | 5,970 | 7,990 | 2,020 | 25% | 4,810 | 5,630 | 820 | 15% |
| Shoreline Boulevard | 6,440 | 6,720 | 280 | 4% | 6,300 | 7,380 | 1,080 | 15% |
| **Total** | **15,340** | **18,850** | **3,510** | **19%** | **13,050** | **16,630** | **3,580** | **22%** |

Notes:
1. Volumes rounded to nearest 10.
2. Morning Target = Inbound morning peak period; Evening Target = Outbound evening peak period.

Source: Fehr & Peers, 2019.


# 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, two development projects have been constructed and occupied (Sobrato – 1255 Pear Avenue 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 (TBD)
- Broadreach (2019)[7]
- Microsoft (2020)
- Sobrato – 1255 Pear Avenue Mixed-Use Office and Residential (2023)
- Shashi Hotel (2020)
- Charleston East (2021)
- 1100 La Avenida Affordable Housing (TBD)
- Landings and Huff Garage (2023)

The locations of these development projects are presented in **Figure 26**, and **Table 10** 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 26** also shows the location of the remaining known and pending projects in the North Bayshore District.

[7] The Broadreach building has been constructed and is being prepared for occupancy in the Fall of 2019.

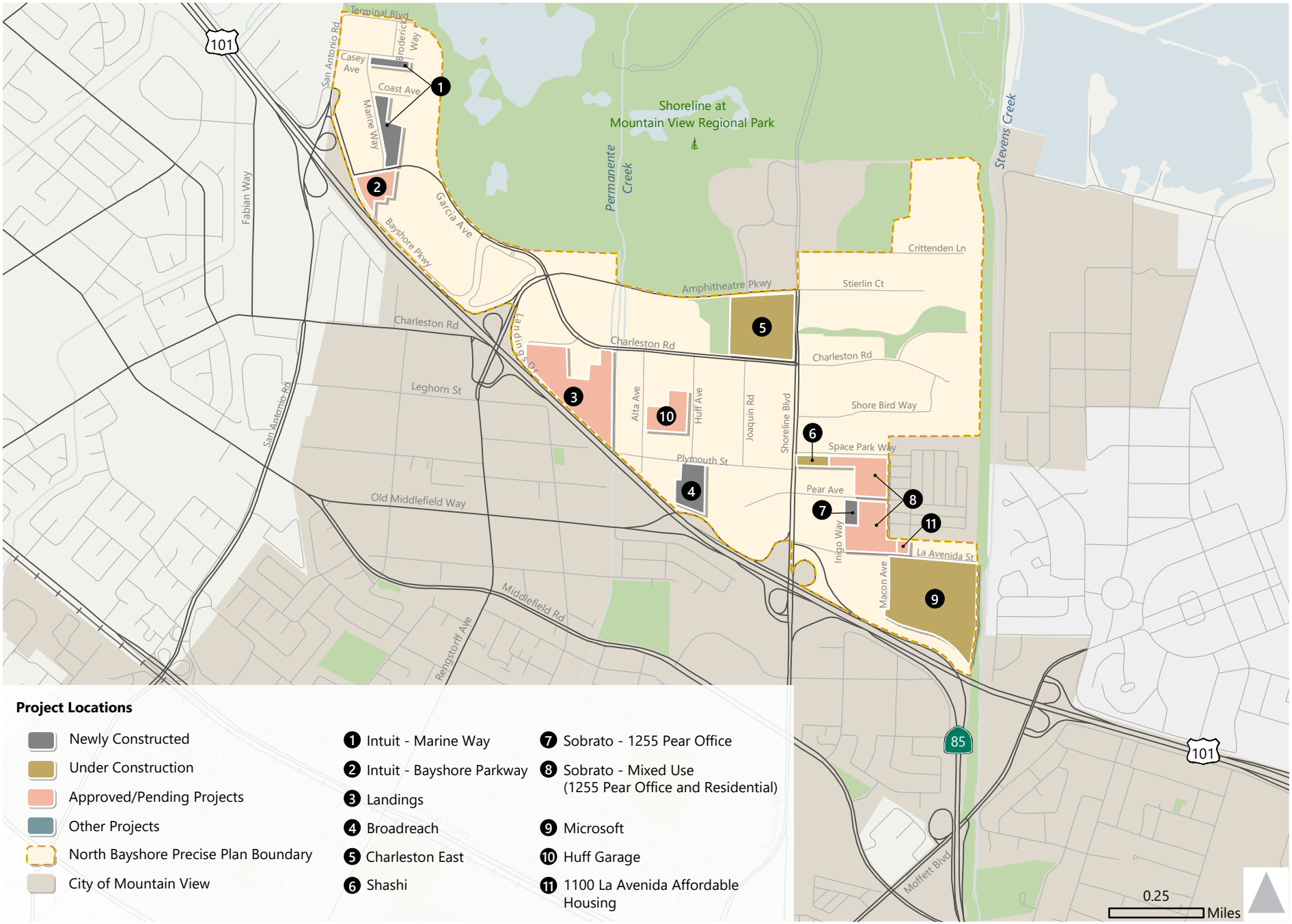



Figure 26

## Project Locations

## Table 10: 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 | | | | |
| Broadreach | | | | | +224,505 | | | | |
| 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 | | | | | +794,416 | (-249,224) | +8,588 | | |
| Total New Development | | | +878 | +200 | +2,667,411 | | +12,988 | +14,000 | |
| Total Demolition | (-107,236) | | | | | (-257,950) | | | |
| **Net Total** | **(-107,236)** | | **+878** | **+200** | **+2,667,411** | **(-257,950)** | **+12,988** | **+14,000** | |

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.) are vacant and being prepared for demolition. These buildings are not included in the 2019 Existing Conditions and therefore are not included as demolished buildings.
3. Existing buildings (515,680 s.f.) are either demolished or vacant and being prepared for remodel. These buildings are not included in the 2019 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, 2019.

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

- 2,302,225 square feet of office, research & development, and industrial building space
- 200 hotel rooms
- 26,988 square feet of restaurant, retail, and service building space
- 878 multi-family dwelling units

**Table 11** 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 11: Land Use In North Bayshore Area: Total Building Area**

| Land Use | Units | Existing 2019 | 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 | 596,919 | 3,247,572 | 5,948,796 |
| Research & Development | Square Feet | 5,855,041 | 5,552,134 | 4,544,684 |
| Industrial | Square Feet | 247,015 | 216,244 | 148,033 |
| **Subtotal (Office, R&D and Industrial) [B]** | **Square Feet** | **6,698,975** | **9,015,950** | **10,641,513** |
| Retail and Restaurant | Square Feet | 14,058 | 41,046 | 198,538 |
| Service Commercial | Square Feet | 40,888 | 26,138 | 26,138 |
| **Subtotal (Supporting Uses) [C]** | **Square Feet** | **54,946** | **67,184** | **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** | **6,753,921** | **9,083,134** | **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 2019 vacant buildings include: The Broadreach office building of 224,505 s.f was constructed but not occupied; the existing 33,500 s.f. of R&D buildings at the Intuit Bayshore office building site were vacant; and the 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, 1625 Plymouth Street (Broadreach), Microsoft, Sobrato – 1255 Pear Avenue Mixed-Use Office and Residential, Shashi Hotel, Charleston East, La Avenida Affordable Housing, and The Landings.

Source: City of Mountain View VISUM model, 2019.

**Tables 12** and **13** 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 12: Land Use In North Bayshore Area: Occupied[5] Building Area**

| Land Use | Units | Existing 2019[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 | 595,992 | 3,229,634 | 5,875,378 |
| Research & Development | Square Feet | 5,825,767 | 4,961,531 | 3,834,661 |
| Industrial | Square Feet | 245,780 | 193,241 | 137,671 |
| **Subtotal (Office, R&D and Industrial) [B]** | **Square Feet** | **6,667,539** | **8,384,406** | **9,847,710** |
| Retail and Restaurant | Square Feet | 13,988 | 39,551 | 192,931 |
| Service Commercial | Square Feet | 40,684 | 23,357 | 24,308 |
| **Subtotal (Supporting Uses) [C]** | **Square Feet** | **54,672** | **62,908** | **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** | **6,722,211** | **8,447,314** | **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 2019 vacant buildings include: The Broadreach office building of 224,505 s.f was constructed but not occupied; the existing 33,500 s.f. of R&D buildings at the Intuit Bayshore office building site were vacant; and the 91,392 s.f. of R&D buildings are vacant at the Shoreline Commons site.
3. Under Existing 2019, 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, 1625 Plymouth Street (Broadreach), Microsoft, Sobrato – 1255 Pear Avenue Mixed-Use Office and Residential, 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. For informational purposes, if there were a zero vacancy rate, square footage is: Existing Conditions = 6,753,921 square feet, and Near-Term Growth Conditions = 9,083,134 square feet.

Source: City of Mountain View VISUM model, 2019.

## Table 13: Land Use In North Bayshore Area: Employee and Population Estimates

| Land Use | Units | Existing 2019[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 | 2,384 | 12,919 | 23,795 |
| Research & Development | Employees | 20,273 | 17,365 | 15,906 |
| Industrial | Employees | 295 | 232 | 178 |
| **Subtotal (Office, R&D and Industrial) [B]** | **Employees** | **22,952** | **30,530** | **39,879** |
| Retail and Restaurant | Employees | 80 | 161 | 547 |
| Service Commercial | Employees | 122 | 70 | 78 |
| **Subtotal (Supporting Uses) [C]** | **Employees** | **202** | **231** | **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** | **23,578** | **31,251** | **41,721** |
| **Service Population [A+B+C+D]** | | **24,340** | **33,609** | **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 2019 vacant buildings include: The Broadreach office building of 224,505 s.f was constructed but not occupied; the existing 33,500 s.f. of R&D buildings at the Intuit Bayshore office building site were vacant; and the 91,392 s.f. of R&D buildings are vacant at the Shoreline Commons site.
3. Under Existing 2019, 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, 1625 Plymouth Street (Broadreach), 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 = 23,686 employees, and Near-Term Growth Conditions = 33,432 employees.

Source: City of Mountain View VISUM Model, 2019.

# 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 eight 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 14** and **Table 15** shows the estimated gateway morning and evening peak hour trip generation after completion of the eight 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 2019 traffic monitoring, with an estimated 23,578 employees (assuming a ½ percent vacancy rate) and 762 residents. Expressed as a rate, this equates to 0.30 vehicle trips per employee during the morning peak hour and 0.27 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 14** 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 15** and **Figure 27** 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 14: 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] | 5,950 | 1,180 | 7,130 | 1,260 | 4,990 | 6,250 |
| New Project Traffic Cap[1] | 2,240 | 480 | 2,720 | 620 | 2,060 | 2,680 |
| Existing Demolition Credit[1] | -210 | -30 | -240 | -50 | -180 | -230 |
| North Bayshore Gateway Vehicle Trip Reduction Share[1] | -820 | -100 | -920 | -120 | -500 | -620 |
| Near-Term Gateway Trip Total[1] (A) | 7,160 | 1,530 | 8,690 | 1,780 | 6,160 | 7,940 |
| **Net New Gateway Traffic** | **1,210** | **350** | **1,560** | **450** | **1,380** | **1,830** |
| **Peak Hour Gateway 2014 NBPP Capacity Comparison** | | | | | | |
| **2014 NBPP Gateway Capacity (B)** | **6,980** | | **8,100** | | **6,160** | **7,940** |
| **Difference (A-B)** | **180** | | **590** | | **210** | **140** |
| Percent Over Capacity | 3% | | 7% | | 3% | 2% |
| **Peak Hour Gateway 2017 NBPP Capacity Comparison** | | | | | | |
| **2017 NBPP Gateway Capacity (B)** | | | **8,290** | | | **8,030** |
| **Difference (A-B)** | | | **400** | | | **50** |
| Percent Over Capacity | | | -5% | | | 1% |

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, 1625 Plymouth Street (Broadreach), Microsoft, Sobrato – 1255 Pear Avenue Mixed-Use Office and Residential, Shashi Hotel, Charleston East, La Avenida Affordable Housing, and The Landings.
4. The 2,240 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, 2019.

**Table 15: Near-Term Gateway 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] | 5,950 | 1,180 | 7,130 | 1,260 | 4,990 | 6,250 |
| New Project Traffic Cap[1] | 2,240 | 480 | 2,720 | 620 | 2,060 | 2,680 |
| Existing Demolition Credit[1] | -210 | -30 | -240 | -50 | -180 | -230 |
| North Bayshore Gateway Vehicle Trip Reduction Share[1] | -1,400 | -270 | -1,670 | -220 | -790 | -1,010 |
| Near-Term Gateway Trip Total[1] (A) | 6,580 | 1,360 | 7,940 | 1,610 | 6,080 | 7,690 |
| **Net New Gateway Traffic** | **630** | **180** | **810** | **350** | **1,090** | **1,440** |
| **Peak Hour Gateway 2014 NBPP Capacity Comparison** | | | | | | |
| **2014 NBPP Gateway Capacity (B)** | **6,980** | | **8,100** | | **6,160** | **7,940** |
| **Difference (A-B)** | **-400** | | **-160** | | **-80** | **-250** |
| Percent Over Capacity | -6% | | -2% | | -1% | -3% |
| **Peak Hour Gateway 2017 NBPP Capacity Comparison** | | | | | | |
| **2017 NBPP Gateway Capacity (B)** | | | **8,290** | | | **8,030** |
| **Difference (A-B)** | | | **-350** | | | **-340** |
| Percent Over Capacity | | | -4% | | | -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, 1625 Plymouth Street (Broadreach), Microsoft, Sobrato – 1255 Pear Avenue Mixed-Use Office and Residential, Shashi Hotel, Charleston East, La Avenida Affordable Housing, and The Landings.
4. The 2,240 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, 2019.

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 14**, 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 15** 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 14** and **15** 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 16** to **19** summarize the Near-Term Growth gateway demand volumes by gateway.

**Table 16: 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) | 1,426 | 219 | 1,645 | 2,706 | 427 | 3,133 | 3,030 | 881 | 3,911 |
| **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)** | **-104** | | **-55** | **-254** | | **-157** | **540** | | **801** |
| Percent Over Capacity | -7% | | -3% | -9% | | -5% | 22% | | 26% |
| **Peak Hour Gateway 2017 NBPP Capacity Comparison** | | | | | | | | | |
| **2017 NBPP Gateway Capacity (B)** | | | **1,890** | | | **3,290** | | | **3,110** |
| **Difference (A-B)** | | | **-245** | | | **-157** | | | **801** |
| Percent Over Capacity | | | -13% | | | -5% | | | 26% |

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, 1625 Plymouth Street (Broadreach), Microsoft, Sobrato – 1255 Pear Avenue Mixed-Use Office and Residential, Shashi Hotel, Charleston East, La Avenida Affordable Housing, and The Landings.
4. The 2,240 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, 2019.

## Table 17: 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) | 246 | 942 | 1,188 | 505 | 2,191 | 2,696 | 959 | 3,234 | 4,193 |
| **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)** | | **-398** | **-552** | | **101** | **256** | | **504** | **433** |
| Percent Over Capacity | | -30% | -32% | | 5% | 10% | | 18% | 12% |
| **Peak Hour Gateway 2017 NBPP Capacity Comparison** | | | | | | | | | |
| **2017 NBPP Gateway Capacity (B)** | | | **1,830** | | | **2,440** | | | **3,760** |
| **Difference (A-B)** | | | **-642** | | | **256** | | | **433** |
| Percent Over Capacity | | | -35% | | | 10% | | | 12% |

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, 1625 Plymouth Street (Broadreach), Microsoft, Sobrato – 1255 Pear Avenue Mixed-Use Office and Residential, Shashi Hotel, Charleston East, La Avenida Affordable Housing, and The Landings.
4. The 2,240 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, 2019.

## Table 18: 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) | 1,362 | 208 | 1,570 | 2,523 | 399 | 2,922 | 2,692 | 758 | 3,450 |
| **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)** | **-168** | | **-130** | **-437** | | **-368** | **202** | | **340** |
| Percent Over Capacity | -11% | | -8% | -15% | | -11% | 8% | | 11% |
| **Peak Hour Gateway 2017 NBPP Capacity Comparison** | | | | | | | | | |
| **2017 NBPP Gateway Capacity (B)** | | | **1,890** | | | **3,290** | | | **3,110** |
| **Difference (A-B)** | | | **-320** | | | **-368** | | | **340** |
| Percent Over Capacity | | | -17% | | | -11% | | | 11% |

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, 1625 Plymouth Street (Broadreach), Microsoft, Sobrato – 1255 Pear Avenue Mixed-Use Office and Residential, Shashi Hotel, Charleston East, La Avenida Affordable Housing, and The Landings.
4. The 2,240 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, 2019.

**Table 19: 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) | 235 | 914 | 1,149 | 481 | 2,110 | 2,591 | 894 | 3,056 | 3,950 |
| **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)** | | **-426** | **-591** | | **20** | **151** | | **326** | **190** |
| Percent Over Capacity | | -32% | -34% | | 1% | 6% | | 12% | 5% |
| **Peak Hour Gateway 2017 NBPP Capacity Comparison** | | | | | | | | | |
| **2017 NBPP Gateway Capacity (B)** | | | **1,830** | | | **2,440** | | | **3,760** |
| **Difference (A-B)** | | | **-681** | | | **151** | | | **190** |
| Percent Over Capacity | | | -37% | | | 6% | | | 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, 1625 Plymouth Street (Broadreach), Microsoft, Sobrato – 1255 Pear Avenue Mixed-Use Office and Residential, Shashi Hotel, Charleston East, La Avenida Affordable Housing, and The Landings.
4. The 2,240 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, 2019.

# 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 800 vehicles; if the Council were to adopt an alternate trip cap focused just on the inbound direction the exceedance would be about 540 vehicles. During the same morning peak hour the San Antonio and Rengstorff gateways would be under capacity by 50 to 250 vehicles.

In the evening peak hour, the Shoreline and Rengstorff gateways would likely exceed gateway capacity by anywhere from 100 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 400 to 640 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

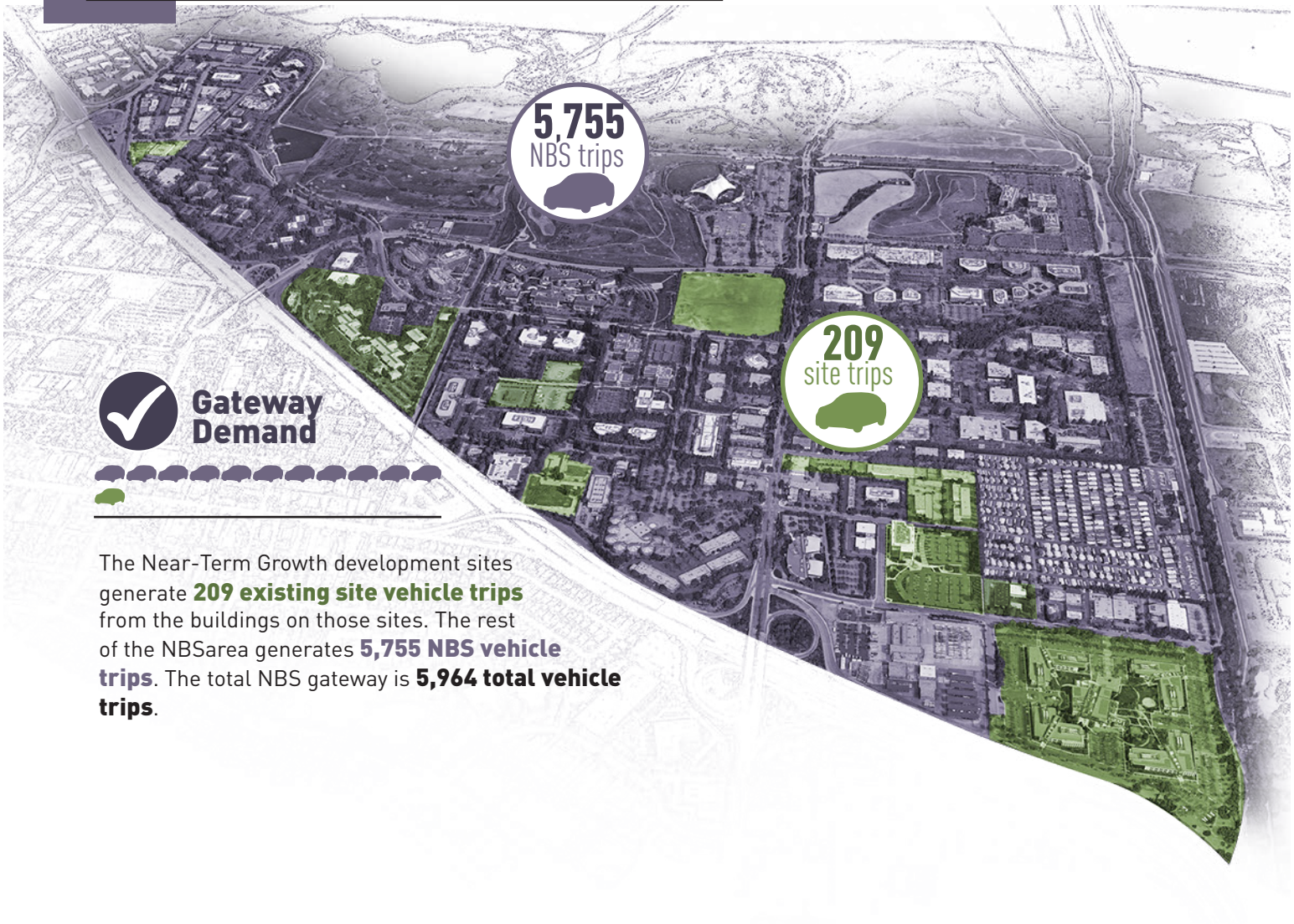
The concept of the North Bayshore gateway vehicle trip reduction share means that each new development would need to be combined with an incremental reduction in existing vehicle trips, so as to assure that the overall trip target is achieved once all planned new development is constructed. Property 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 27** 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 **209 existing site vehicle trips** from the buildings on those sites. The rest of the NBSarea generates **5,755 NBS vehicle trips**. The total NBS gateway is **5,964 total vehicle trips**.

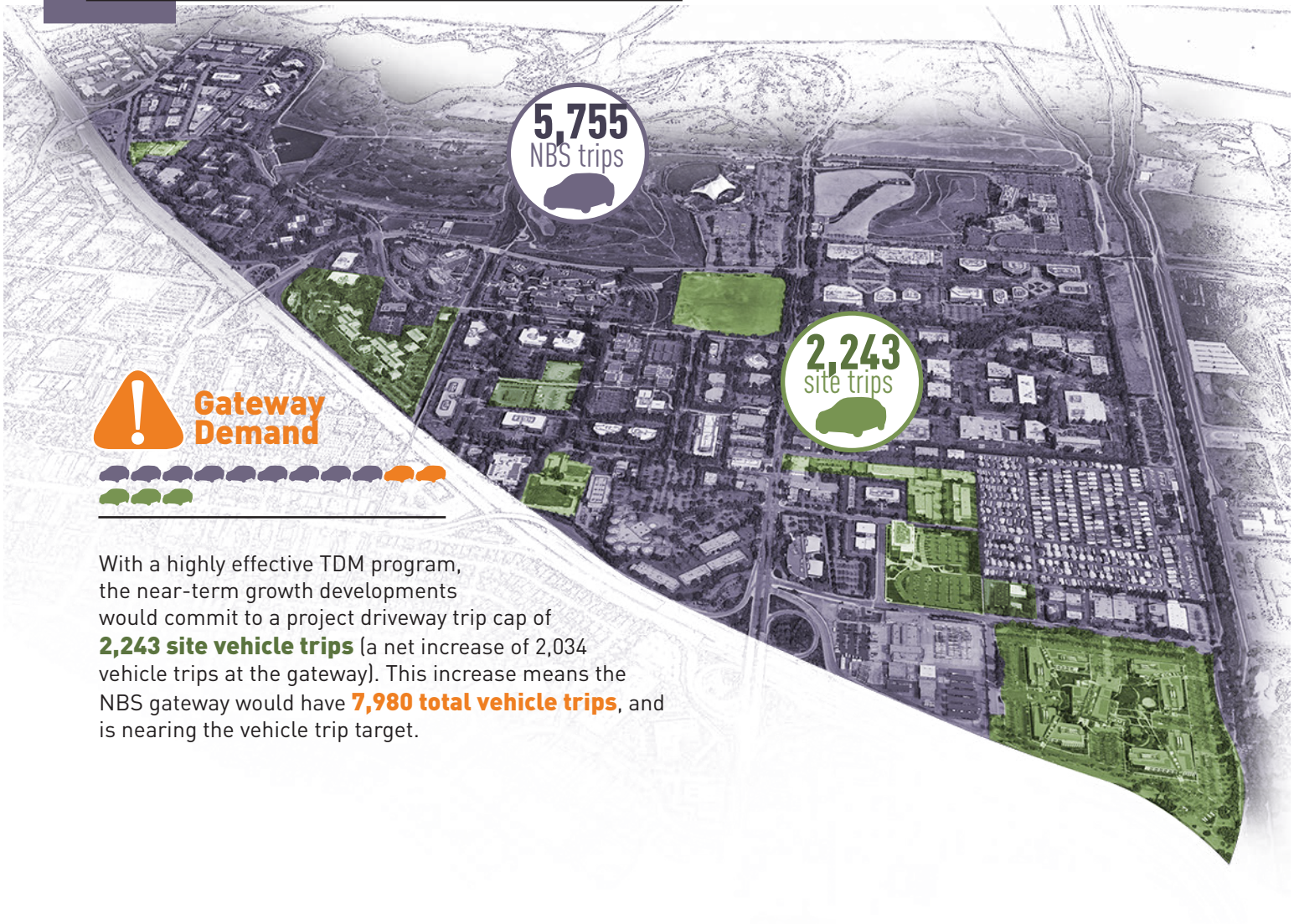
Figure 27-A

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 **2,243 site vehicle trips** (a net increase of 2,034 vehicle trips at the gateway). This increase means the NBS gateway would have **7,980 total vehicle trips**, and is nearing the vehicle trip target.

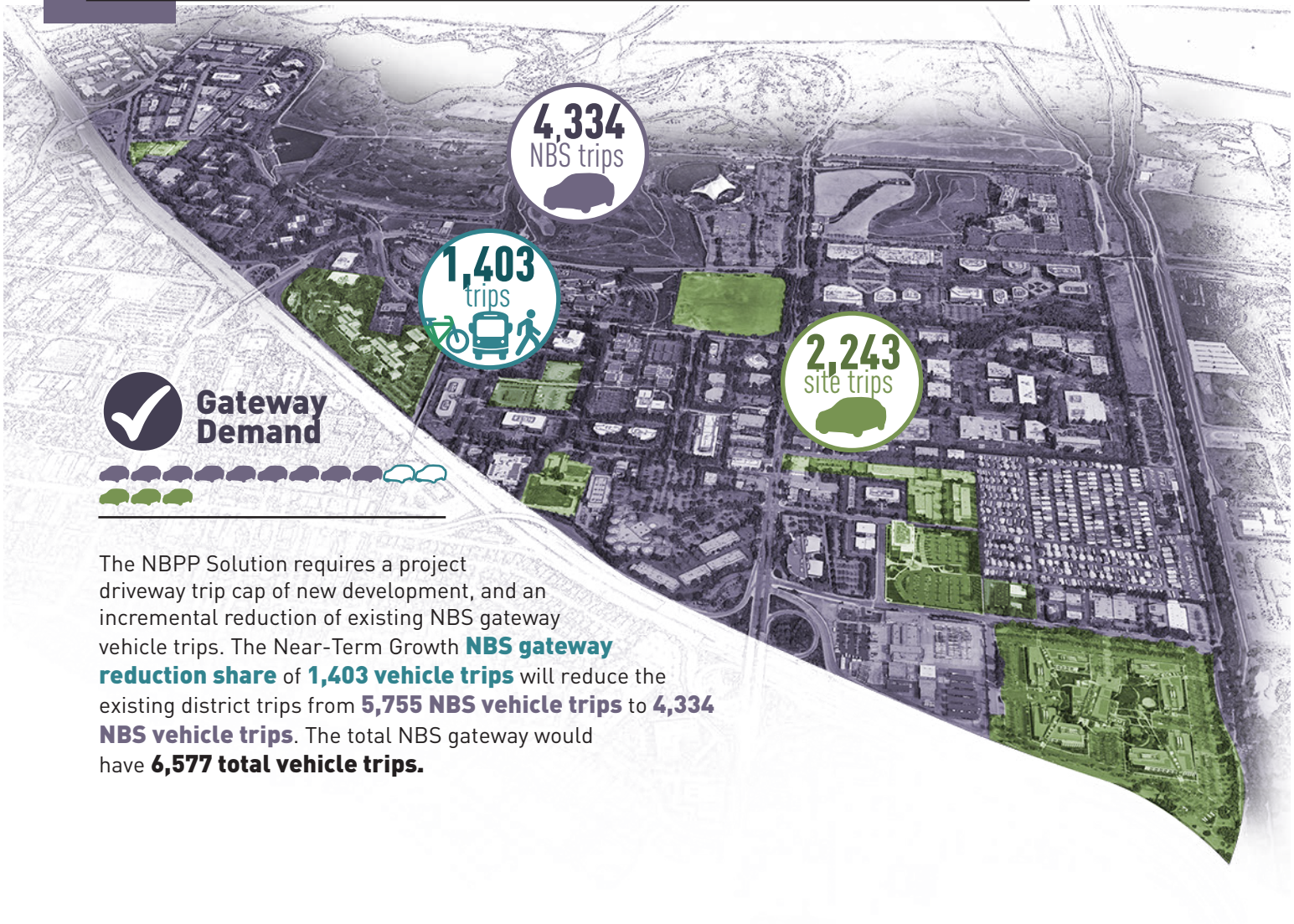
Figure 27-B

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*

# 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 **1,403 vehicle trips** will reduce the existing district trips from **5,755 NBS vehicle trips** to **4,334 NBS vehicle trips**. The total NBS gateway would have **6,577 total vehicle trips.**

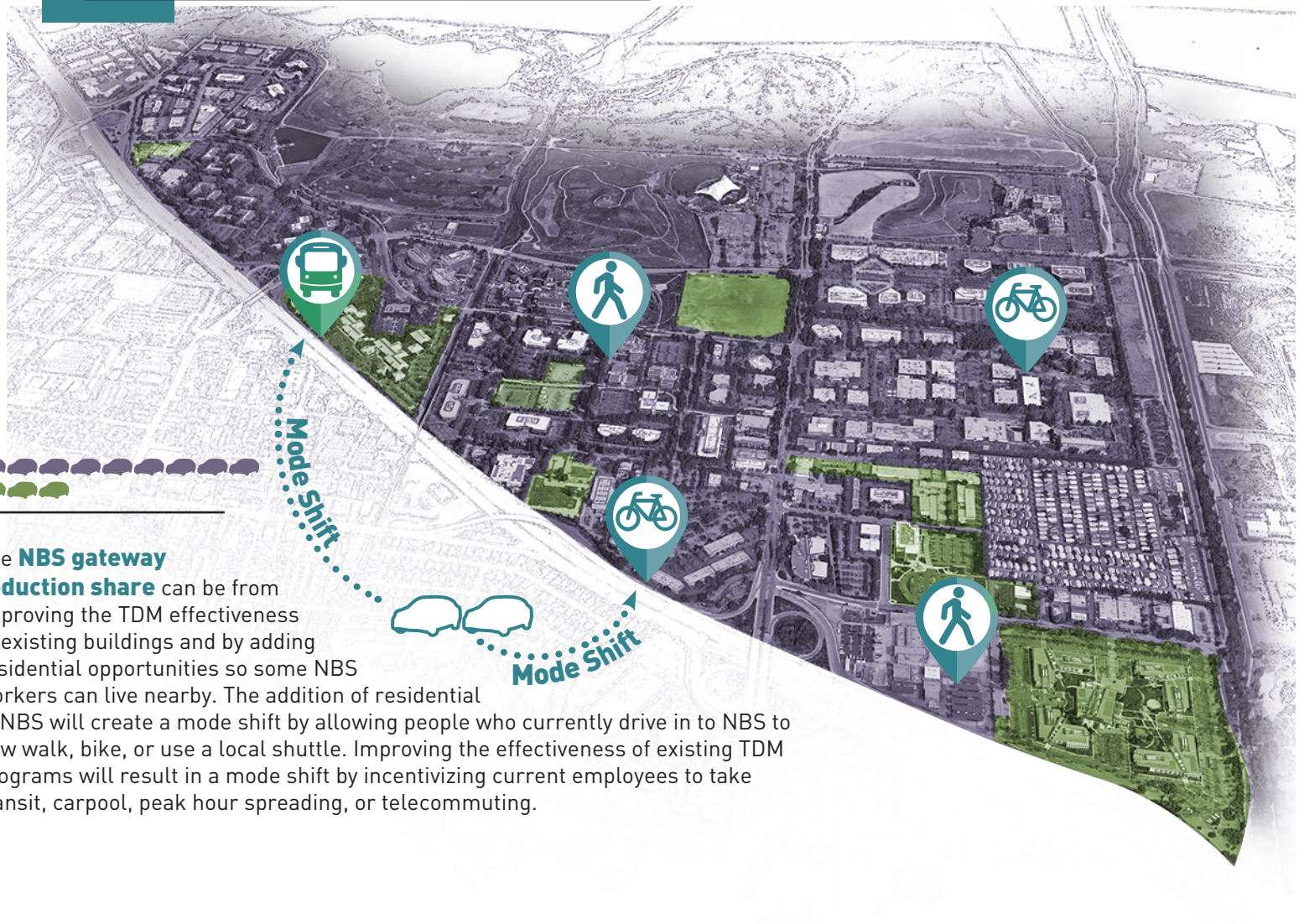
Figure 27-C

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 27-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 28**:

- 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

- Near-Term Transportation Improvements

    6. Amphitheatre Parkway and Garcia Avenue-Charleston Road signal timing modifications
    7. 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.
    8. Plymouth Street Re-Alignment with Space Park Way
    9. Shoreline Boulevard / US 101 Northbound Off-Ramp Re-Alignment
    10. Extend Inigo Way from Pear Avenue to Space Park (part of Sobrato Mixed-Use Development)
    11. Extend Joaquin Road from Charleston Road to Amphitheatre Parkway (part of Charleston East project)
    12. Shoreline Boulevard Reversible Transit Lane between Middlefield Road and Pear Avenue.
    13. US 101 Bicycle and Pedestrian Path between Terra Bella Avenue (West of Shoreline Boulevard) and Plymouth Street.

To help understand the timing of each improvement, the dates are summarized in **Table 20**. 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 20** and **Figure 28**. Finally, **Figure 29** 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.

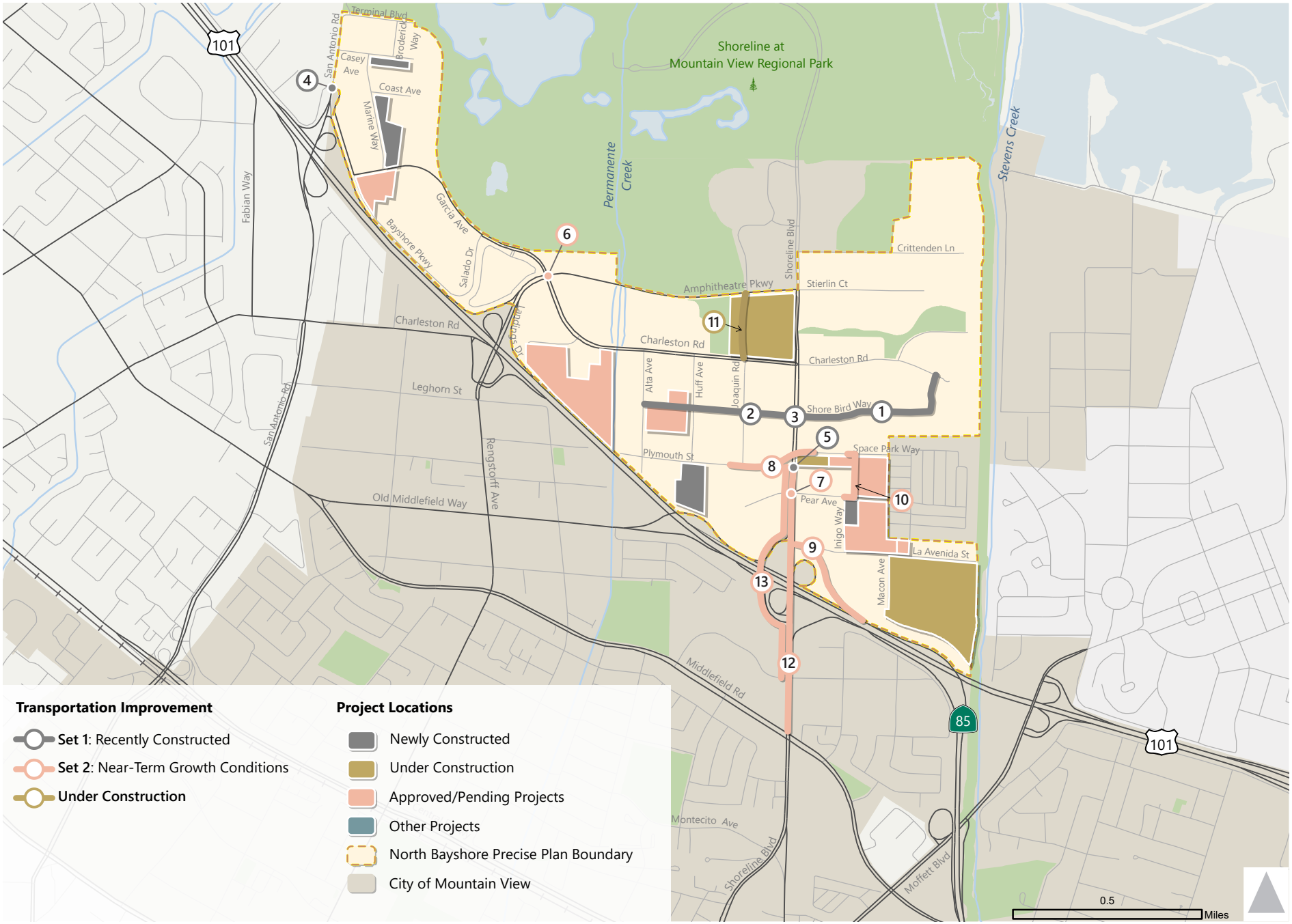



Figure 28

## North Bayshore Transportation Improvement Project Map

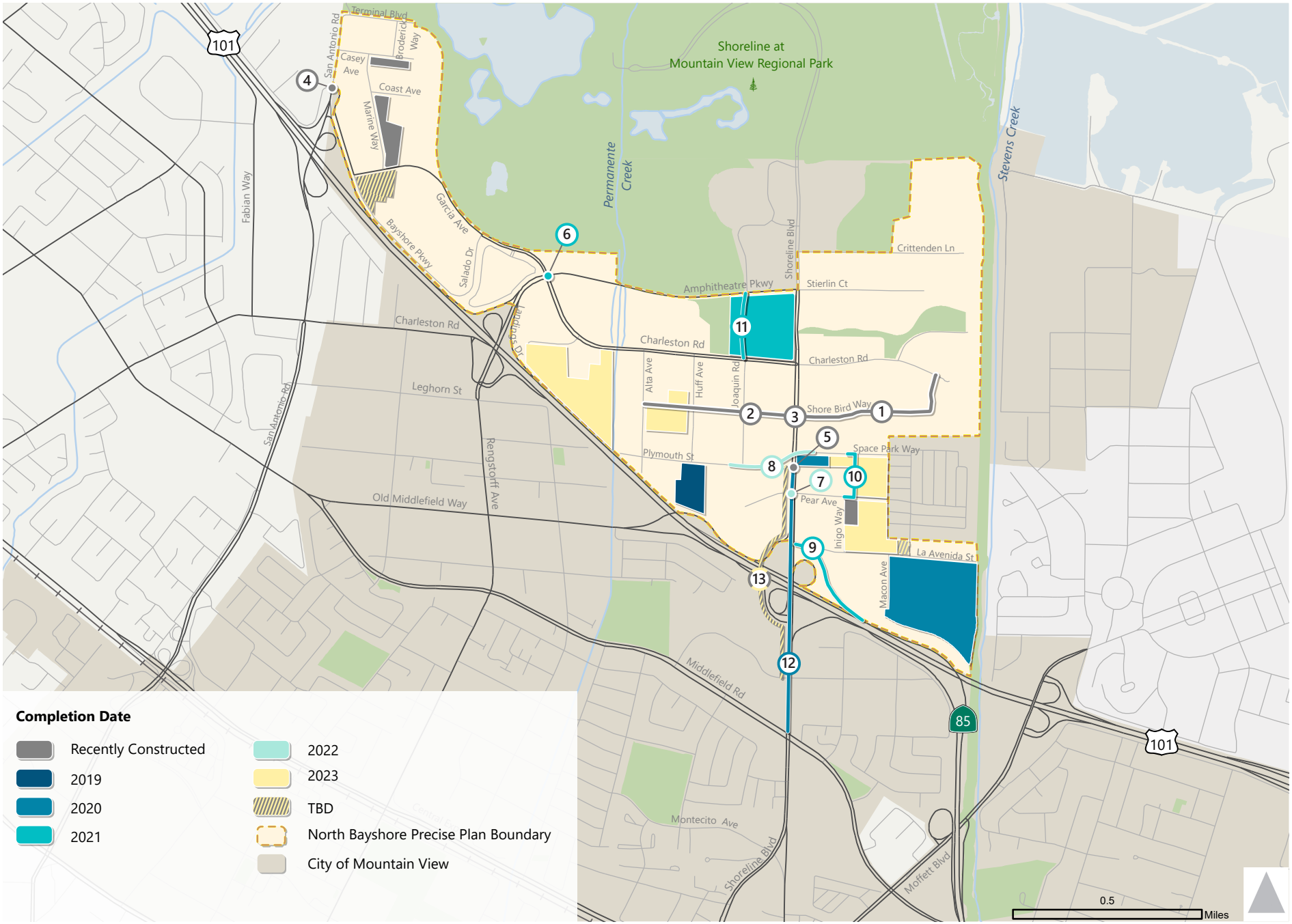



Figure 29

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

## Table 20: North Bayshore Transportation Improvements

| ID Number | Facility | Extent of Improvement | Description of Improvement | Estimated Completion Year |
|---|---|---|---|---|
| ***Set 1: Recently Constructed*** | | | | |
| 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 |
| ***Set 2: Near-Term Growth Conditions*** | | | | |
| 6 | Amphitheatre Pkwy and Garcia Ave-Charleston Rd | At Intersection | Signal timing modifications | 2021 |
| 7 | 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 |

## Table 20: North Bayshore Transportation Improvements

| ID Number | Facility | Extent of Improvement | Description of Improvement | Estimated Completion Year |
|---|---|---|---|---|
| 8 | 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 |
| 9 | 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 |
| 10 | 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 |
| 11 | Joaquin Rd | Charleston Rd to Amphitheatre Pkwy | Two-lane street with bicycle lanes and sidewalks. | 2021 |
| ***Set 3: Other City Prioritized Improvements*** | | | | |
| 12 | Shoreline Boulevard Reversible Transit Lane | Pear Avenue to Middlefield Road | Center-running, reversible transit lane extending from Middlefield Avenue north to Pear Avenue. | 2020 |
| 13 | US 101 Bicycle and Pedestrian Path | Terra Bella Ave to Plymouth St | Multiuse path. | TBD |

Source: City of Mountain View, April 2019.

# Gateway Demand and Vehicle Trip Target Summary

The eight Near-Term development projects would add about 2,329,200 square feet or about 3,500 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 30** and **31** 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.

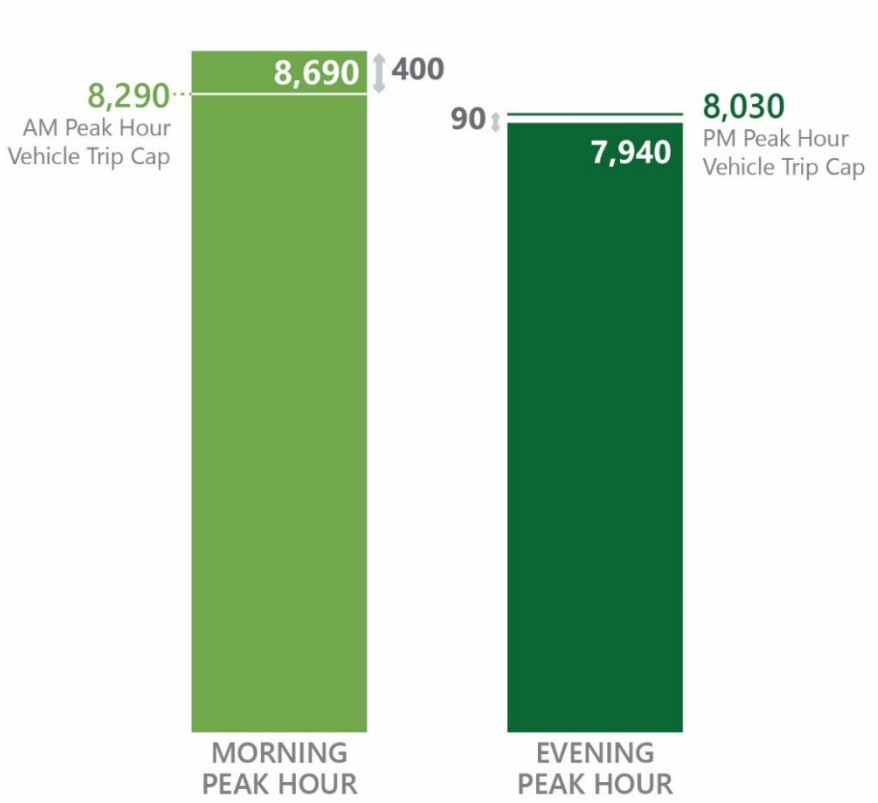



*Figure 30: Two-Way Near-Term Gateway Vehicle Demand without Additional TDM Applied to Existing Buildings and Vehicle Trip Cap Comparison*

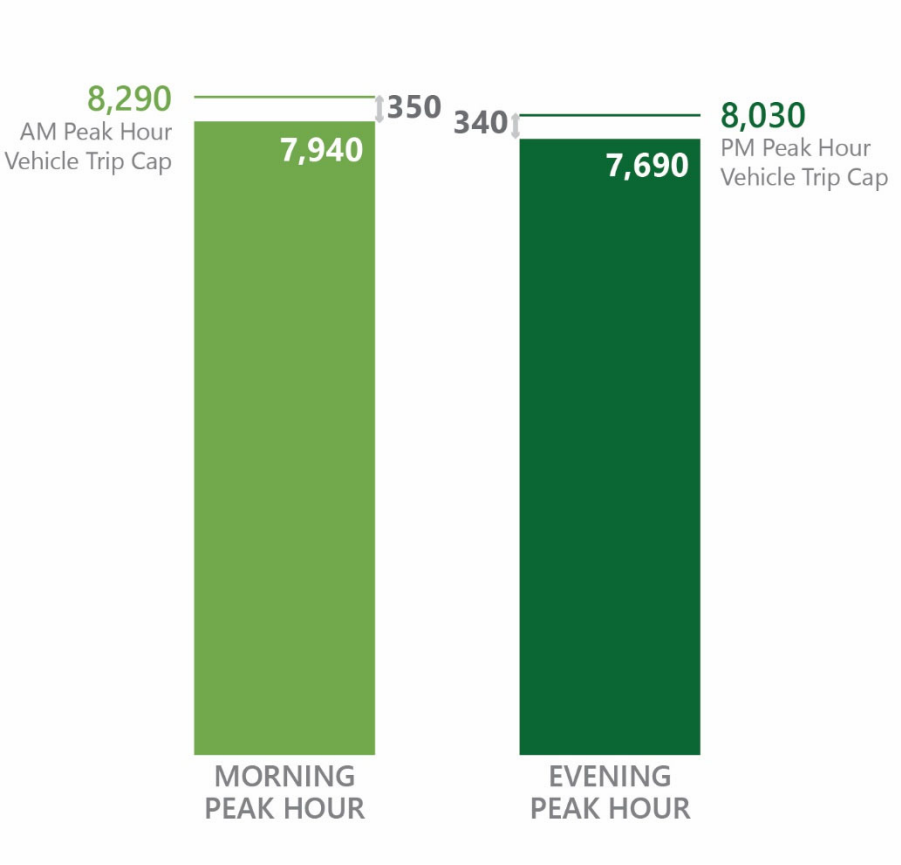



*Figure 31: Two-Way Near-Term Gateway Vehicle Demand with Additional TDM Applied to Existing Buildings and Vehicle Trip Cap Comparison*

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 eight 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.