MEMORANDUM

To: Jim Lightbody and Aruna Bodduna, City of Mountain View

From: Sam Corbett and Kim Voros, Alta

Date: March 18, 2021

Re: North Bayshore Bicycle and Pedestrian Capacity Analysis Results for 2040 and Infrastructure Recommendations

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Introduction

Major redevelopment and construction planned for North Bayshore will result in the addition of up to ten thousand new residential units along with significant increases in office space and other supportive land uses at full build out. In order to accommodate the new population without excessive increases in motor vehicle trips, investment in bicycle and pedestrian infrastructure and supportive Transportation Demand Management (TDM) programs are required. The purpose of the *2020 North Bayshore Bicycle and Pedestrian Circulation Study* (Circulation Study*)* was to model estimated future bicycle and pedestrian activity, and to assess whether the proposed infrastructure is sufficient to accommodate the number of estimated riders and recommend modifications if necessary. The results of this assessment will help create world-class walking and bicycling facilities within North Bayshore. While the focus of the analysis was on district gateways—the primary modal connections between external facilities and North Bayshore—internal circulation was also assessed. TDM strategies are only discussed briefly in this study and further detail may be necessary as part of another study. The findings of this study support and in some instances refine the bicycle and pedestrian infrastructure recommendations described in the *North Bayshore Precise Plan* (Precise Plan).

District Background and Context

North Bayshore is located at the northern end of Mountain View and borders Mountain View Regional Park to the north, Highway 101 to the south, Palo Alto to the west, and Stevens Creek to the east (see Map 1). North Bayshore is home to many tech companies and includes large Google, Microsoft, and Intuit campuses. The residential population is currently small. A vision and associated guiding principles for the redevelopment of the district are laid out in the *2014* Precise Plan and subsequent amendments. The Precise Plan includes recommendations for land use, green building, habitat, mobility, infrastructure, implementation, and a 10 percent active mode share for all commute trips and 25 percent active mode share for all internal trips.

Due to the separation of North Bayshore from the rest of Mountain View created by Highway 101, access to the district is constrained to five major entry points referred to as gateways (see Map 1). These gateways include San Antonio Road, North Rengstorff Avenue, North Shoreline Boulevard, the Permanente Creek Trail and the Stevens Creek Trail. Each gateway has an associated motor vehicle trip cap, which is intended to help maintain the quality of access to and circulation within the district. High quality, connected bicycle and pedestrian infrastructure and supportive TDM strategies are employed as part of the strategy to maintain high-quality access. In spring 2020, the Rengstorff Avenue gateway exceeded its trip cap during the afternoon commute, while the North Shoreline Boulevard gateway exceeded its trip cap during the morning commute.[1] With projected growth, the North Shoreline Boulevard gateway will likely be over the motor vehicle capacity during both commute periods before 2030.

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

Background Document Review

Over 40 relevant planning and policy documents—such as master plans, TDM plans, transportation monitoring reports, site-specific drawings, and traffic analyses—were reviewed to accurately assess existing and future travel patterns and infrastructure in North Bayshore. The documents were reviewed to identify and understand the location of relevant bicycle and pedestrian counts, infrastructure recommendations, and TDM measures. The review was focused on infrastructure information on street sections and facility types. For the full document review, see Appendix A.

Subsets of these documents were also reviewed for potential company incentive programs and other related TDM measures including: *North Bayshore Precise Plan, 2015 North Bayshore TDM Plan Guidelines, 2018 Citywide Multimodal Improvement Plan, 2018 North Bayshore Residential TDM Guidelines, the 2017 – 2019 North Bayshore District Transportation Monitoring Reports,* and the *2015 Mountain View Bicycle Master Plan Update.*

In addition to infrastructure and TDM measures, documents were also reviewed for bicycle and pedestrian counts to understand existing and estimated future bicycle and pedestrian activity. The Precise Plan established vehicle trip caps as part of the City's TDM requirements. Bi-annual traffic counts, including bicycle and pedestrian counts, are collected through the Transportation Monitoring Reports to assess the North Bayshore District's vehicle trip cap performance. The Transportation Monitoring Reports provided the most consistent and robust bicycle and pedestrian count data, which is measured at each of the District's five gateways, although these documents provide counts at various intersections throughout the District.

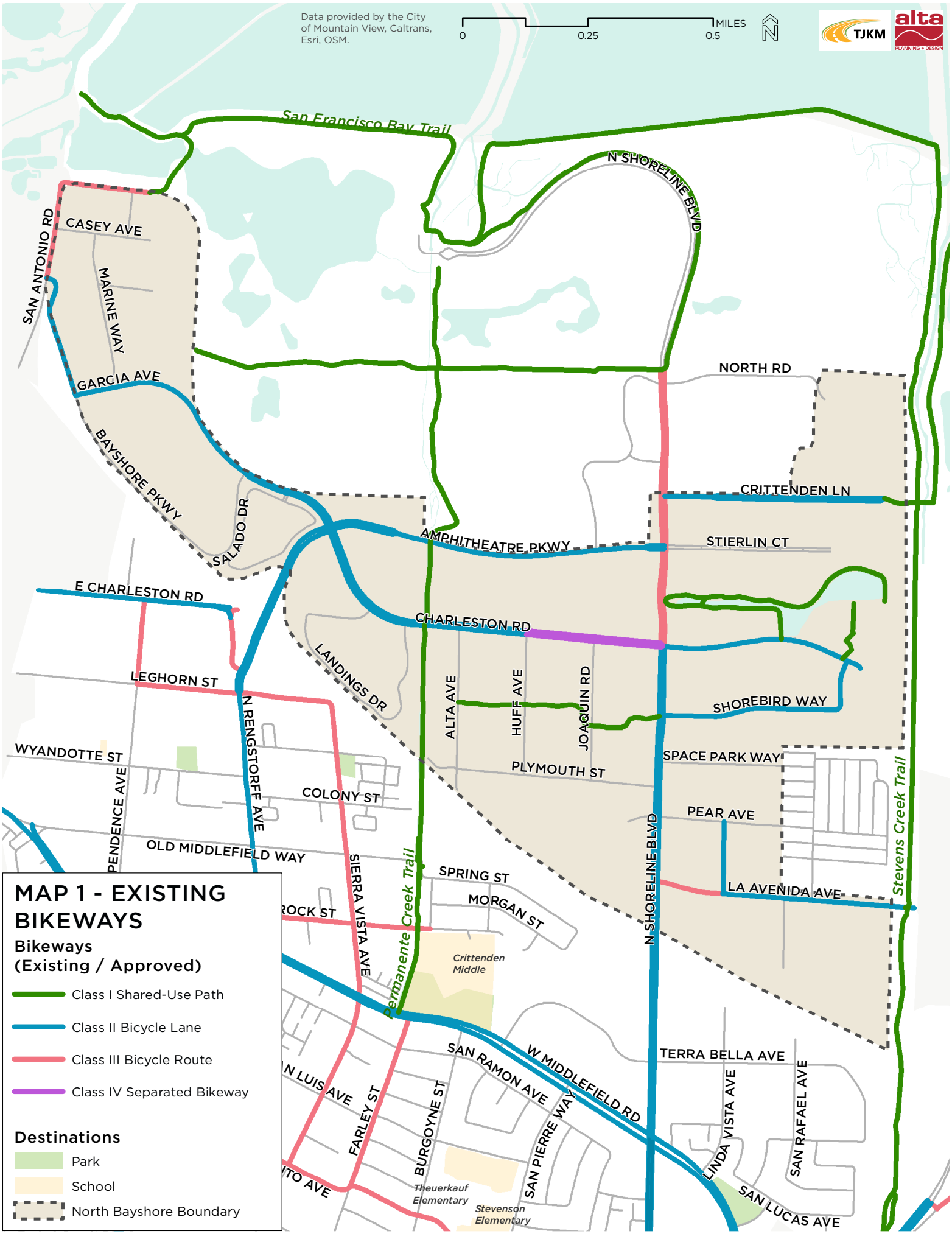
Existing, Approved, and Planned Bicycle and Pedestrian Infrastructure and Network Quality

This Circulation Study uses existing, approved, and planned bicycle and pedestrian infrastructure that was mapped as part of the *AccessMV Comprehensive Modal Plan* (AccessMV) as a foundation for the Circulation Study's existing and future infrastructure and network quality assessment. The existing, approved, and planned infrastructure information was refined based on more detailed district- and site-level plans reviewed during the background document review. The Circulation Study also relies on an assessment of existing and future bicycle network quality. The assessment technique is known as a Bicycle Level of Traffic Stress (BLTS) analysis and was completed as part of the AccessMV development effort. BLTS is a simple 1 – 4 scale that is used to quantify the bicycling user experience. A BLTS of 1 is considered an All Ages and Abilities facility while a BLTS of 4 is considered a facility that is appropriate for highly confident bicyclists.[2] See Appendix B for more information on the BLTS.

[2] A quality assessment of pedestrian activity was also developed as part of the Modal Plan development effort but is not used in the Circulation Study.

Existing, Approved and Planned Bicycle Infrastructure

Existing, approved, and planned bicycle facilities and their BLTS are shown on Maps 1 – 4. Currently, high-quality bicycle access to North Bayshore is provided by the Stevens Creek, Permanente Creek, and Bay Trails. High quality existing and approved bicycle facilities within North Bayshore include the Google Green Loop and Class IV facilities along part of Charleston Road. Class II facilities exist on most major roadways (see Map 1). While trails provide a low-stress user experience, most of the major roadways within North Bayshore are currently rated as a BLTS 3, a high-stress user experience (see Map 2). Map 3 shows the planned future bicycle infrastructure, which includes conversion of many Class II facilities to Class IV and development or construction of a network of low-stress greenway circulators and access streets. Map 4 shows a future BLTS based on planned facilities. Almost all of the transportation infrastructure within North Bayshore is projected to be a BLTS 1 once the planned network is completed.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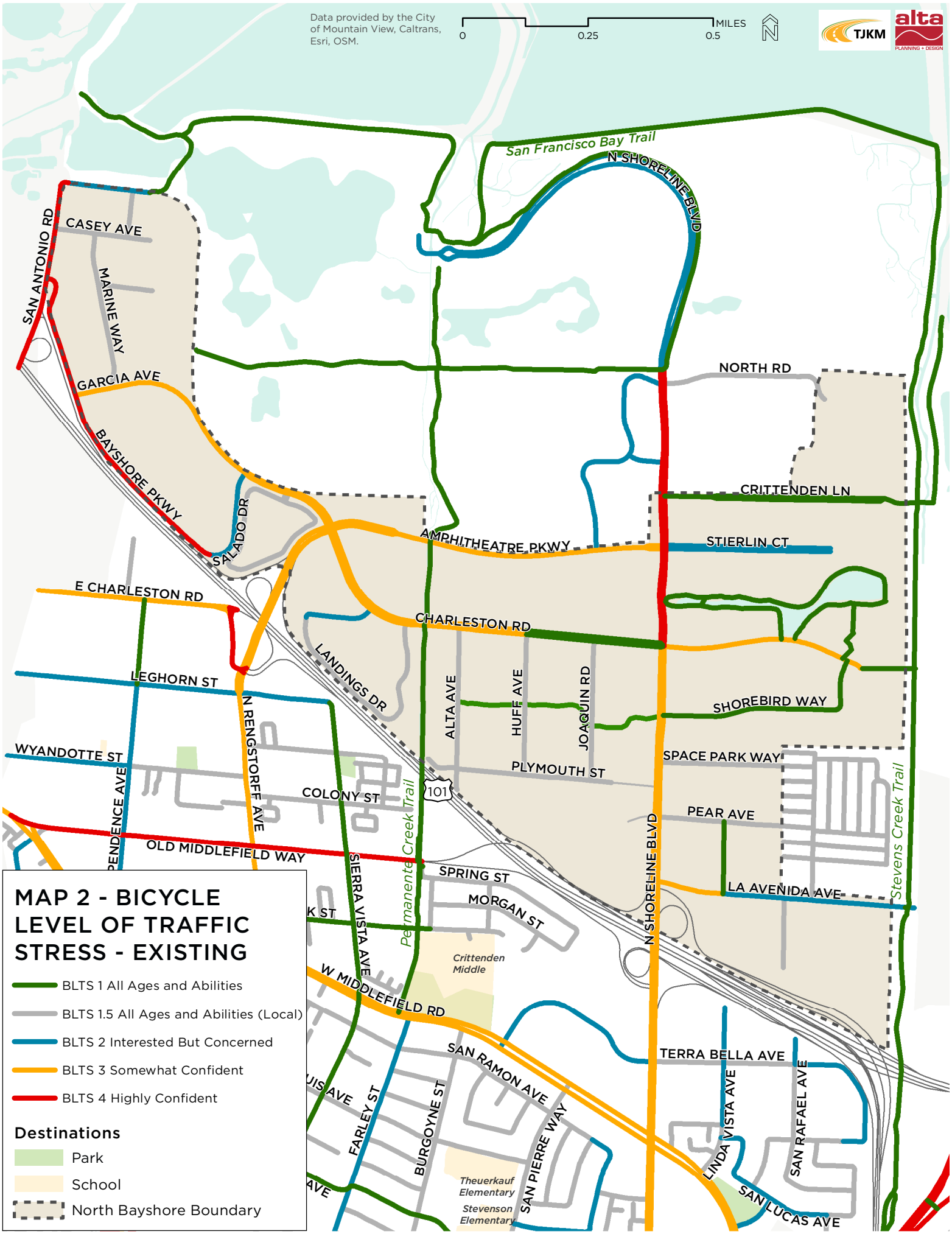
Theuerkauf Elementary
Stevenson Elementary
SAN LUCAS AVE
MAP 1 - EXISTING BIKEWAYS
Bikeways (Existing / Approved)
Class I Shared-Use Path
Class II Bicycle Lane
Class III Bicycle Route
Class IV Separated Bikeway
Destinations
Park
School
North Bayshore Boundary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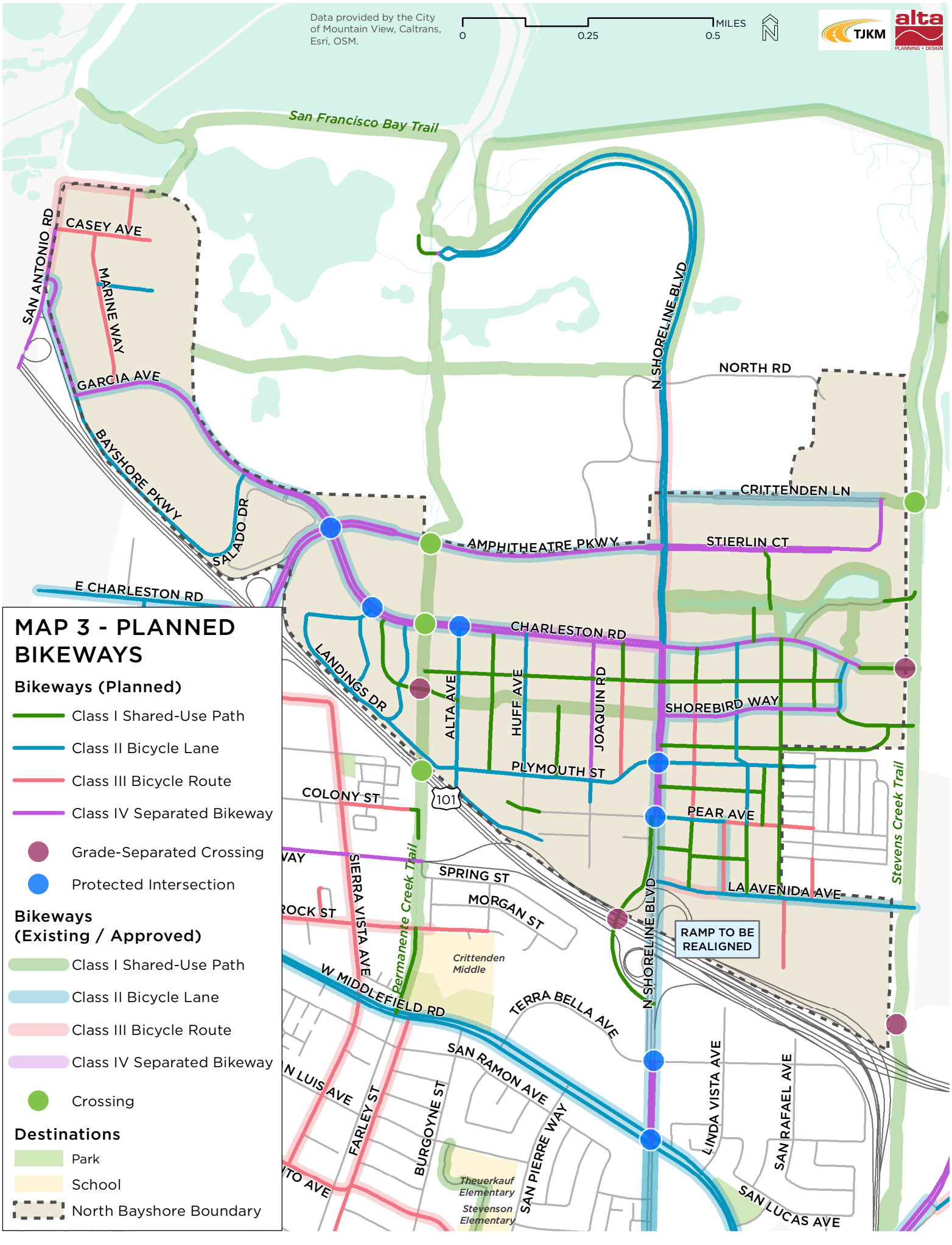
Theuerkauf Elementary
Stevenson Elementary
SAN LUCAS AVE
MAP 2 - BICYCLE LEVEL OF TRAFFIC STRESS - EXISTING
BLTS 1 All Ages and Abilities
BLTS 1.5 All Ages and Abilities (Local)
BLTS 2 Interested But Concerned
BLTS 3 Somewhat Confident
BLTS 4 Highly Confident
Destinations
Park
School
North Bayshore Boundary



MAP 3 - PLANNED BIKEWAYS

Bikeways (Planned)

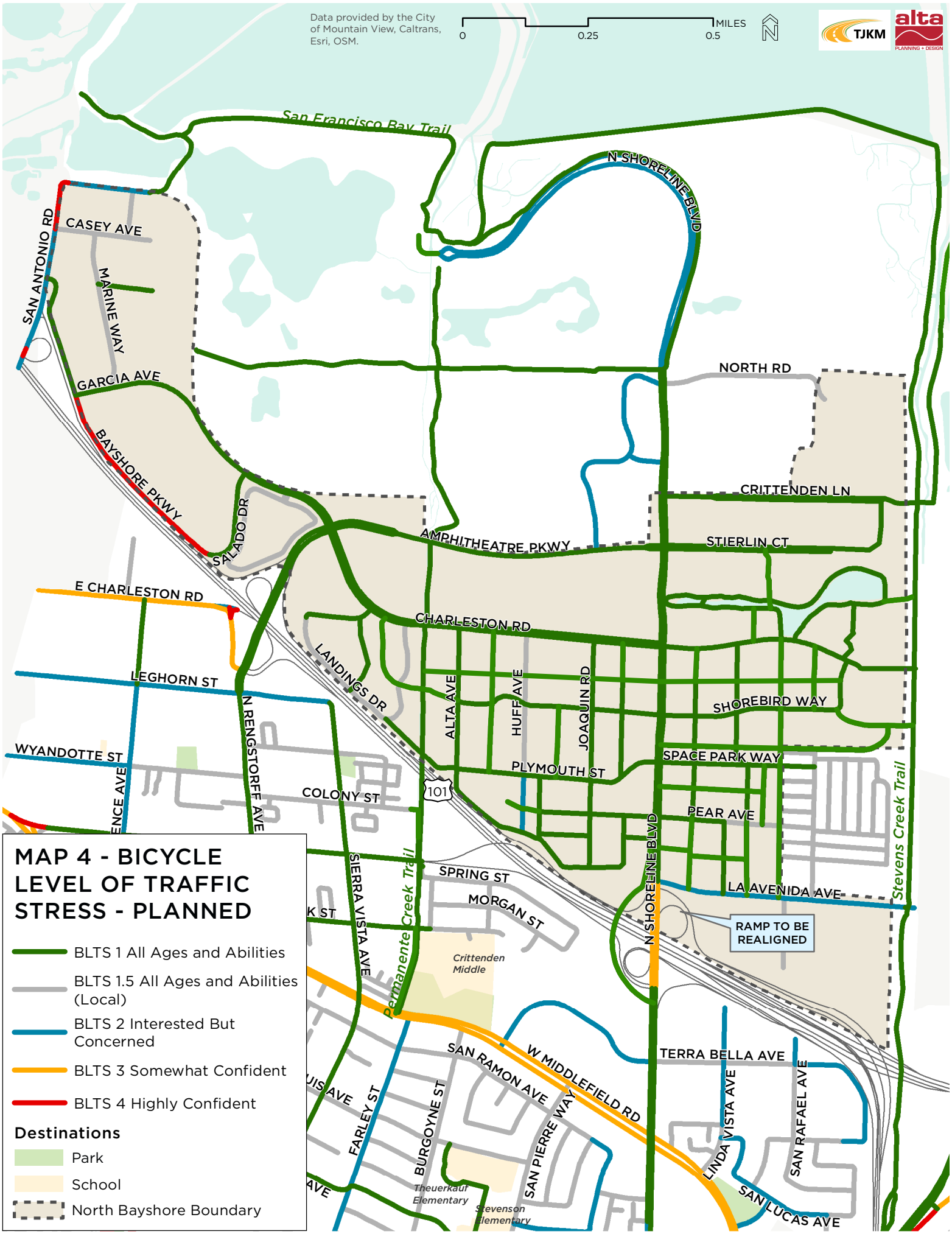
- Class I Shared-Use Path
- Class II Bicycle Lane
- Class III Bicycle Route
- Class IV Separated Bikeway
- Grade-Separated Crossing
- Protected Intersection

Bikeways (Existing / Approved)

- Class I Shared-Use Path
- Class II Bicycle Lane
- Class III Bicycle Route
- Class IV Separated Bikeway
- Crossing

Destinations

- Park
- School
- North Bayshore Boundary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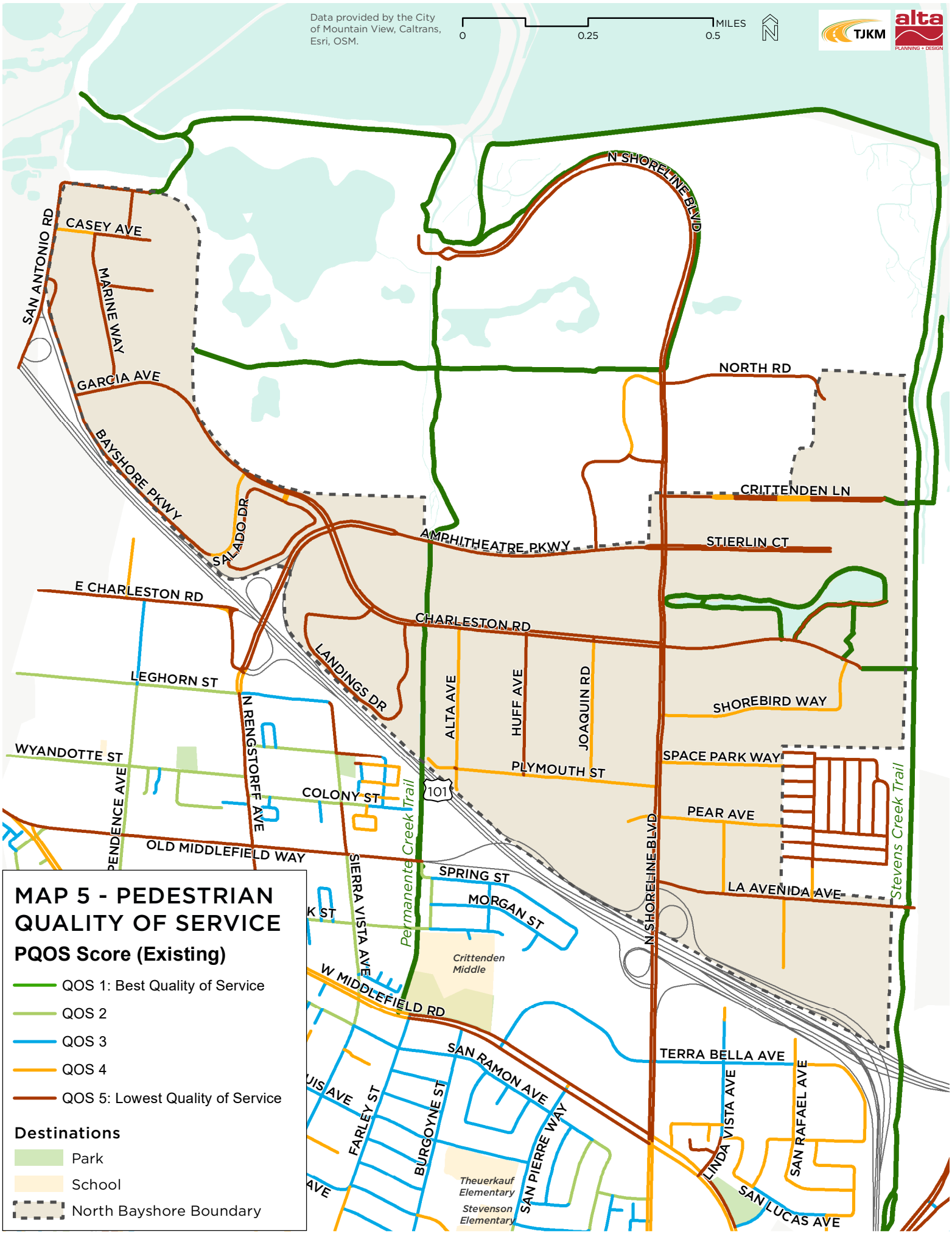
SAN LUCAS AVE
MAP 4 - BICYCLE LEVEL OF TRAFFIC STRESS - PLANNED
BLTS 1 All Ages and Abilities
BLTS 1.5 All Ages and Abilities (Local)
BLTS 2 Interested But Concerned
BLTS 3 Somewhat Confident
BLTS 4 Highly Confident
Destinations
Park
School
North Bayshore Boundary

Existing, Approved, and Planned Pedestrian Infrastructure

Maps 5 – 8 show the existing, approved, and planned pedestrian infrastructure and the Pedestrian Quality of Service (PQOS). The PQOS is shown on Map 5 while existing pedestrian infrastructure is shown on Maps 6 and 7. Specifically, Map 6 shows the location of traffic signals, trails and the status of sidewalks (complete, missing on one side, existing with gaps or completely missing) and Map 7 shows the location of trails, stop signs and crosswalks. Map 5 shows that most roadways in North Bayshore have at least some sidewalk infrastructure. Sidewalks are missing along the North Shoreline Boulevard overcrossing of US 101, Stierlin Court, portions of Rengstorff Avenue and the access roadway for the Google GWC1 building. Sidewalks are present but fragmented or present along only one side of Landings Drive, Bayshore Parkway, portions of Amphitheatre Parkway, Garcia Avenue, Alta Avenue, Crittenden Lane, and San Antonio Road. Sidewalks are typically either five or six feet wide. Planned facilities are shown on Map 8. Planned improvements include infill of sidewalk gaps, protected crossings, and new roadways with complete sidewalks. The future PQOS was not calculated as the methodology relies in part upon Walk Score data. It is expected that the upcoming Mountain View Pedestrian Master Plan will provide further detail on evaluating the quality of future pedestrian improvements (beyond the capacity analysis described in this report).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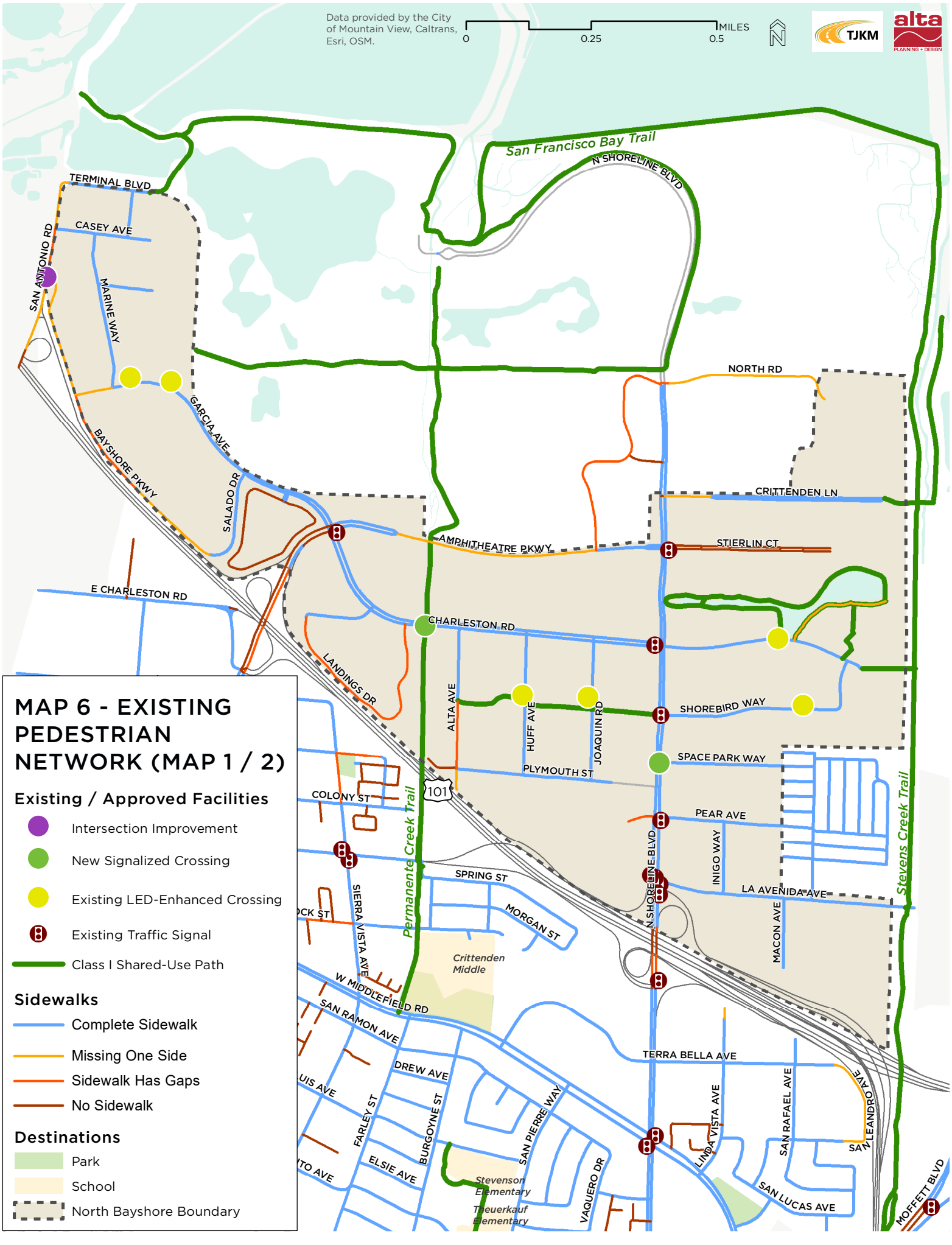
MAP 5 - PEDESTRIAN QUALITY OF SERVICE
PQOS Score (Existing)
QOS 1: Best Quality of Service
QOS 2
QOS 3
QOS 4
QOS 5: Lowest Quality of Service
Destinations
Park
School
North Bayshore Boundary



MAP 6 - EXISTING PEDESTRIAN NETWORK (MAP 1 / 2)

Existing / Approved Facilities

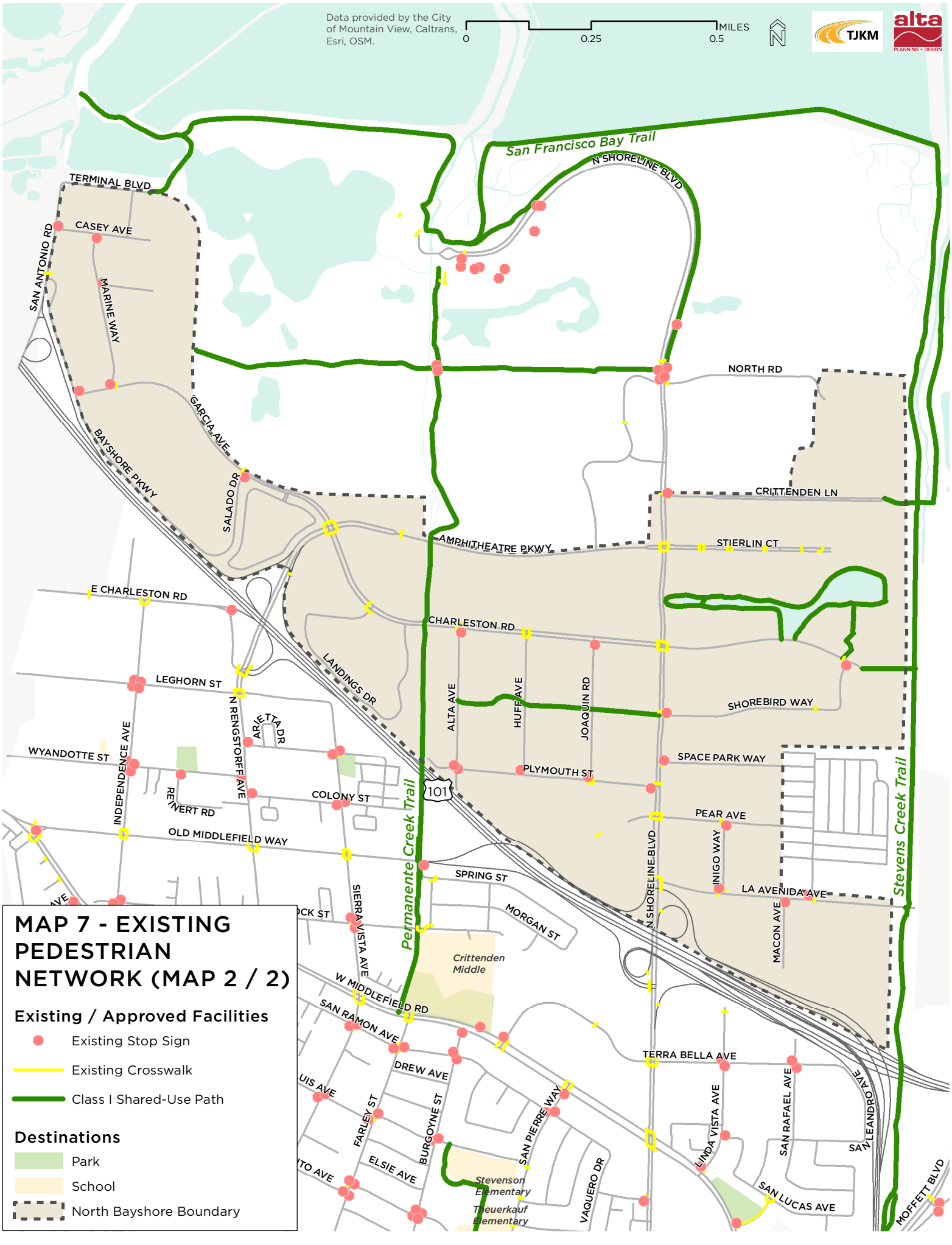
- Intersection Improvement
- New Signalized Crossing
- Existing LED-Enhanced Crossing
- Existing Traffic Signal
- Class I Shared-Use Path

Sidewalks

- Complete Sidewalk
- Missing One Side
- Sidewalk Has Gaps
- No Sidewalk

Destinations

- Park
- School
- North Bayshore Boundary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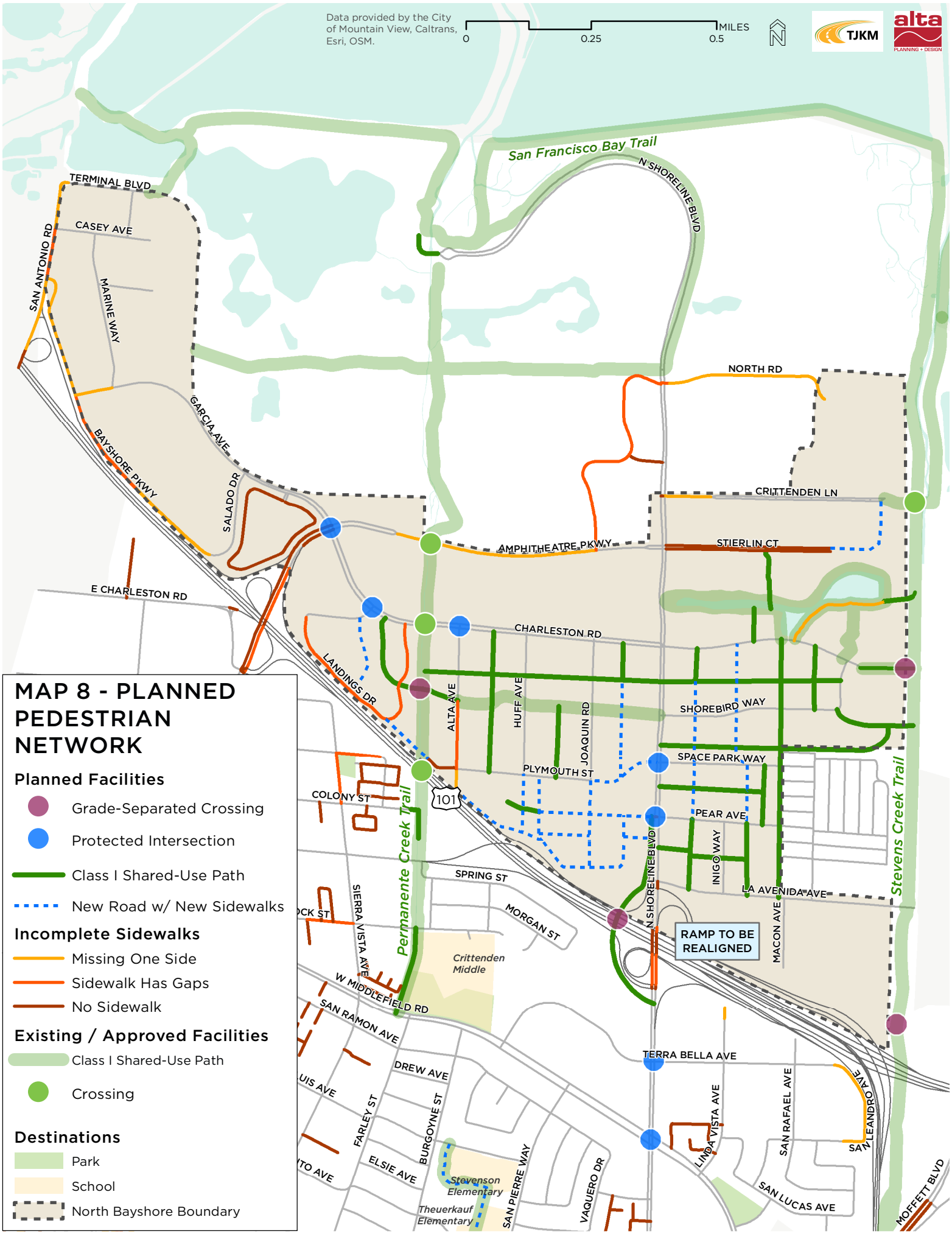
MAP 7 - EXISTING PEDESTRIAN NETWORK (MAP 2 / 2)
Existing / Approved Facilities
Existing Stop Sign
Existing Crosswalk
Class I Shared-Use Path
Destinations
Park
School
North Bayshore Boundary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MAP 8 - PLANNED PEDESTRIAN NETWORK
Planned Facilities
Grade-Separated Crossing
Protected Intersection
Class I Shared-Use Path
New Road w/ New Sidewalks
Incomplete Sidewalks
Missing One Side
Sidewalk Has Gaps
No Sidewalk
Existing / Approved Facilities
Class I Shared-Use Path
Crossing
Destinations
Park
School
North Bayshore Boundary

Existing Bicycle and Pedestrian Activity

Existing bicycle and pedestrian activity was assessed through an employer survey, analysis of observed counts, and modeling of existing flows.

Employer Bicycle and Pedestrian Survey

During the summer of 2020, an employer survey of Google, Microsoft, and Intuit was conducted to understand bicycle and pedestrian commuter activity. The survey was prepared prior to the spread of COVID-19 and reports on travel patterns observed in 2019. The survey was targeted with the employer's transportation coordinator and included questions about number of employees, mode share, travel behavior, existing and potential TDM strategies, and desired infrastructure improvements. See Appendix C for a copy of the employer survey. The results of the survey are briefly summarized below and assume pre-COVID travel activity patterns.

Number of Employees, Mode Share, and Travel Activity

Based on the survey results and city staff, between 23,000 and 25,000 people are estimated to work in North Bayshore by the end of 2020. Employers report that less than five percent of their employees currently live within one mile of work and the percentage of people that live within three miles varies significantly by employer from a low of 13 percent to a high of 39 percent. Google has the highest percentage of employees that commute by bicycle at about six percent. All three companies have a higher percentage of people that commute by bicycle than commute by walking. Employers report that there is some seasonal variation in commute mode share and fewer people bicycle in winter months; changes in pedestrian travel patterns were not reported.

Employers all report that personal trips are made during daytime hours. Intuit employees typically use car share while Google employees divide their trips between shuttles, car share, and bike share services. Microsoft employees currently use car share and expressed interest in a future bike share program.

Barriers to Walking and Bicycling

When asked about barriers to walking and bicycling, all three employers reported that distance and/or perception of distance was a factor. Concerns about physical safety and lack of bicycle and pedestrian infrastructure were also mentioned by all employers.

Supportive Programs

When asked about what types of walking and bicycling encouragement programs currently exist, the response was varied. While Intuit does not offer programs, Google provides robust support for bicycle commuters with amenities like bicycle parking, private showers, and on-site repairs as well as numerous programs and events like Bike to Work Day. Google also offers commuter bikes (or e-bikes) to current employees who are interested in becoming bicycle commuters. Microsoft offers bike tune-ups and monthly rewards to employees who walk and bicycle to work but did not report participation in any events.

Requested Infrastructure Upgrades and Supportive Programs

When asked what was needed to achieve ten percent active mode share, employers reported that both infrastructure and programmatic strategies were needed. Employers noted that much of the needed infrastructure was already in the works. The following specific recommendations were called out:

- Improved connections from both Rengstorff Avenue and San Antonio Boulevard
- Improved bicycle and pedestrian facilities leading to gateways, such as new bicycle facilities along Middlefield Road

- Physical separation for bicycle and pedestrian facilities at each of the existing gateways
- Widening of the Permanente Creek and Stevens Creek Trails, and completion of the Bay Trail
- Exploration of a new connection to the Moffett Federal Airfield/NASA Ames Center, a connection via Farley Street to extend the Permanente Creek trail, and new connections to Palo Alto
- Improved internal high-quality continuous east-west bicycle connections between the Shorebird and Joaquin neighborhoods as well as between North Shoreline Boulevard and the Stevens Creek Trail
- Improved internal high-quality connections along major roadways including North Shoreline Boulevard, Rengstorff Avenue, Charleston Road, Garcia Avenue and Amphitheatre Parkway
- Supportive programs like mobility hubs, secure bike parking, bike share services, and wayfinding

In order to improve safety, employers recommended prioritizing improvements at Rengstorff Avenue, facilities on major roadways, intersection improvements like bicycle signal phasing, installation of RRFBs, and minimizing pedestrian crossing distances at all crossings.

Additional general programmatic recommendations included more marketing, outreach, and education about new and existing bicycle facilities, as well as using tactical urbanism approaches to build infrastructure more quickly. Education and encouragement programs for new residents were also recommended as was development of a city-wide bike share program.

Count-Based Activity Assessment

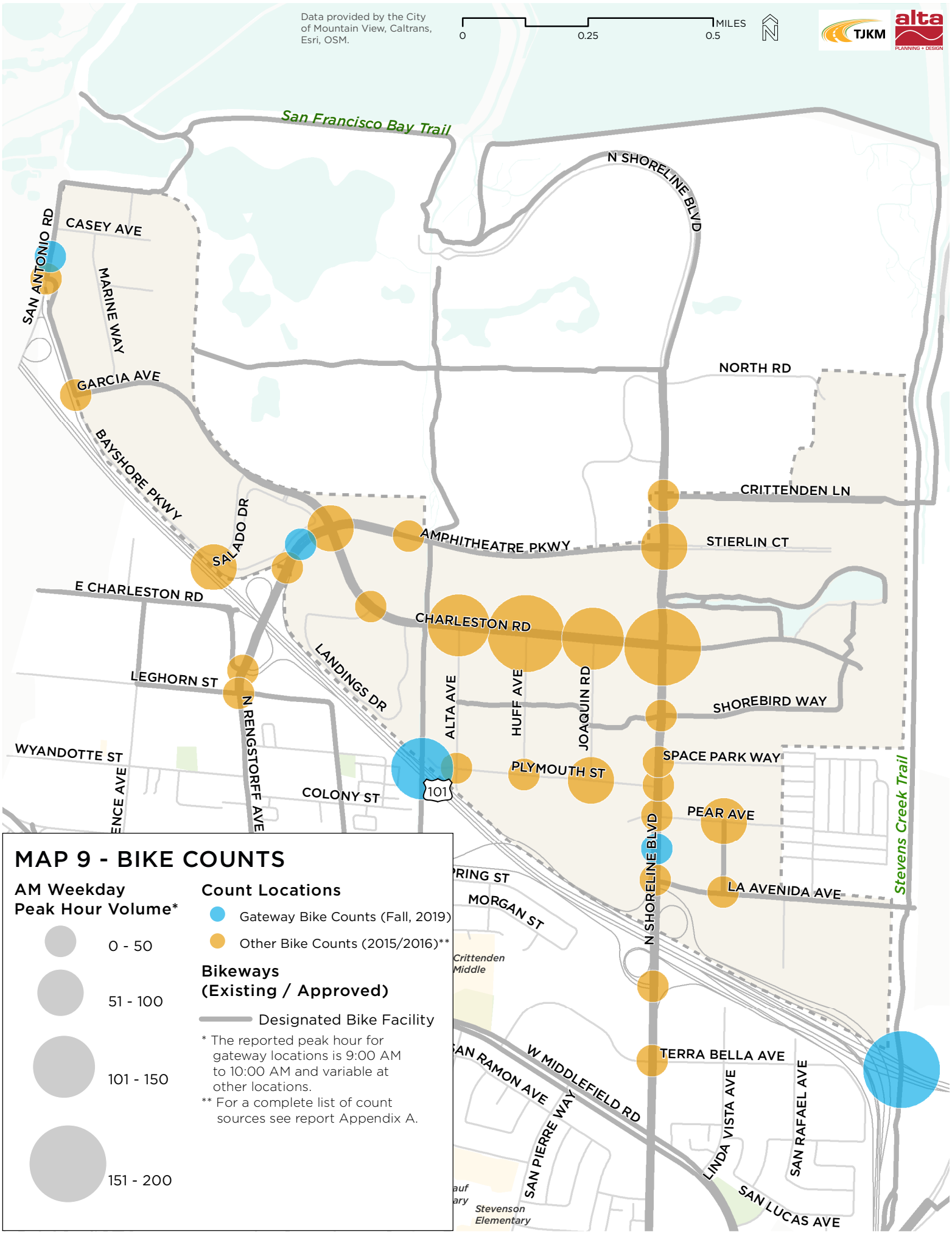
Gateway Activity Patterns

According to the *Spring 2020 District Monitoring Report*, approximately four percent of people entering North Bayshore were using active modes. In the AM peak hour, 73 percent of people using active modes enter via the Permanente Creek Trail (34 percent) or Stevens Creek Trail (39 percent). Rengstorff Avenue accounted for 11 percent of active users, followed by North Shoreline Boulevard (7.5 percent) and San Antonio Road (7.5 percent). This pattern is generally consistent with activity patterns observed at gateways during the PM peak hour.

Gateway and Internal Activity Counts

Counts from the District Monitoring Report series and other sources were compiled and mapped to develop a picture of current bicycle and pedestrian activity at 17 locations throughout North Bayshore. Counts were available for the AM and PM peak hour and shown on Maps 9 – 12. Maps 9 and 11 show AM and PM peak bicycle counts. Gateway counts, shown in blue, are highest for Permanente Creek and Stevens Creek Trails. The Rengstorff Avenue, North Shoreline Boulevard, and San Antonio Road gateways all had lower user counts. Internally, the observed count volumes were highest along Charleston Road. The PM peak hour (see Map 11) shows similar patterns, though afternoon volumes are lower than those observed during the AM peak hour. This activity pattern is consistent with motor vehicle activity patterns and the longer "shoulder" of tech workers who leave at various times throughout the evening.

Maps 10 and 12 show the AM and PM peak hour pedestrian counts. Observed pedestrian volumes are similar at all North Bayshore district gateways. Internally, the highest pedestrian volumes are observed on Charleston Road. The AM and PM pedestrian peak hours show less variation than bicycle and motor vehicle activity patterns. Several lower counts were observed along Charleston Road. Otherwise, observed count volumes were similar during both time periods.



MAP 9 - BIKE COUNTS

AM Weekday Peak Hour Volume*

- 0 - 50
- 51 - 100
- 101 - 150
- 151 - 200

Count Locations

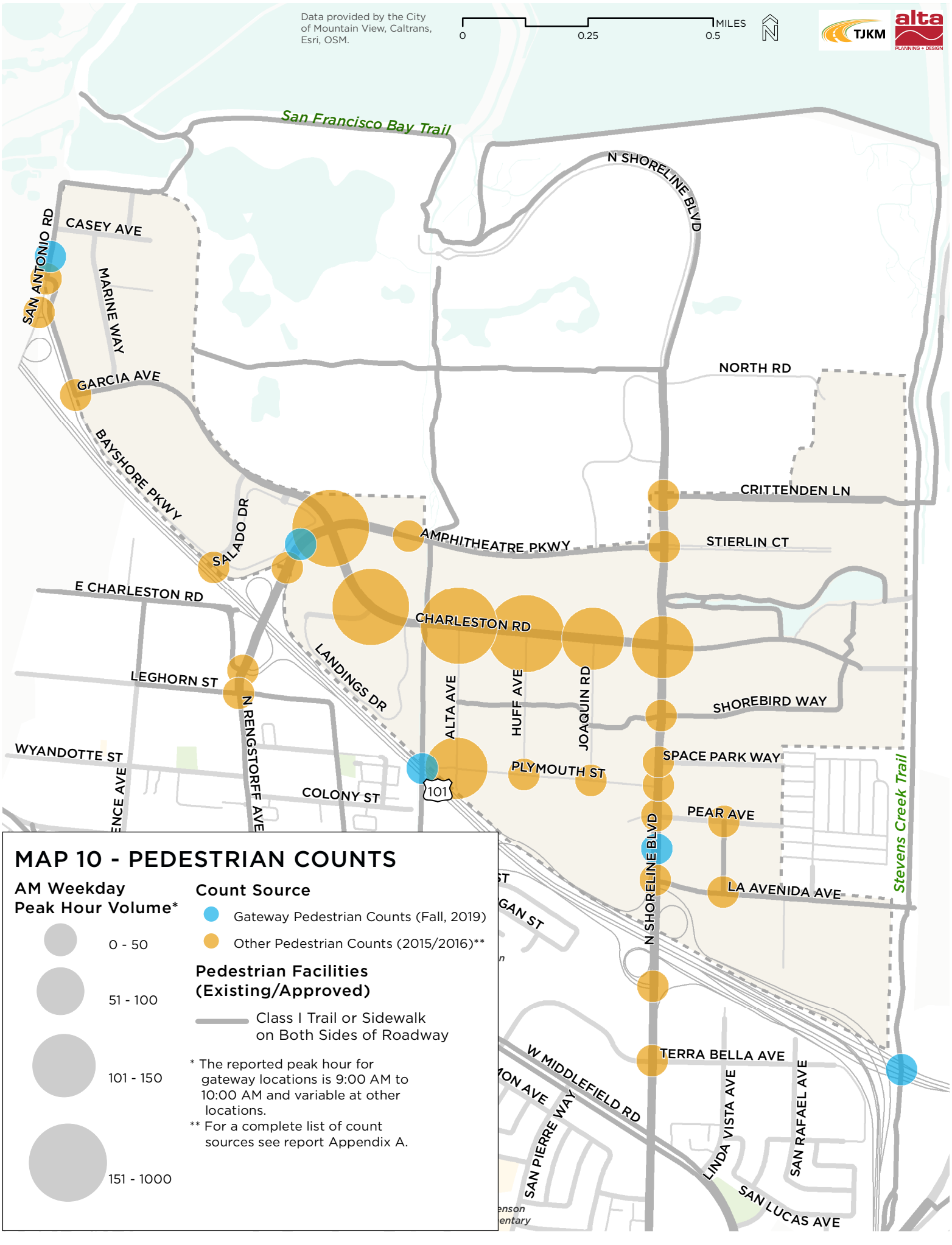
- Gateway Bike Counts (Fall, 2019)
- Other Bike Counts (2015/2016)**

Bikeways (Existing / Approved)

- Designated Bike Facility

* The reported peak hour for gateway locations is 9:00 AM to 10:00 AM and variable at other locations.

** For a complete list of count sources see report Appendix A.



MAP 10 - PEDESTRIAN COUNTS

AM Weekday Peak Hour Volume*

- 0 - 50
- 51 - 100
- 101 - 150
- 151 - 1000

Count Source

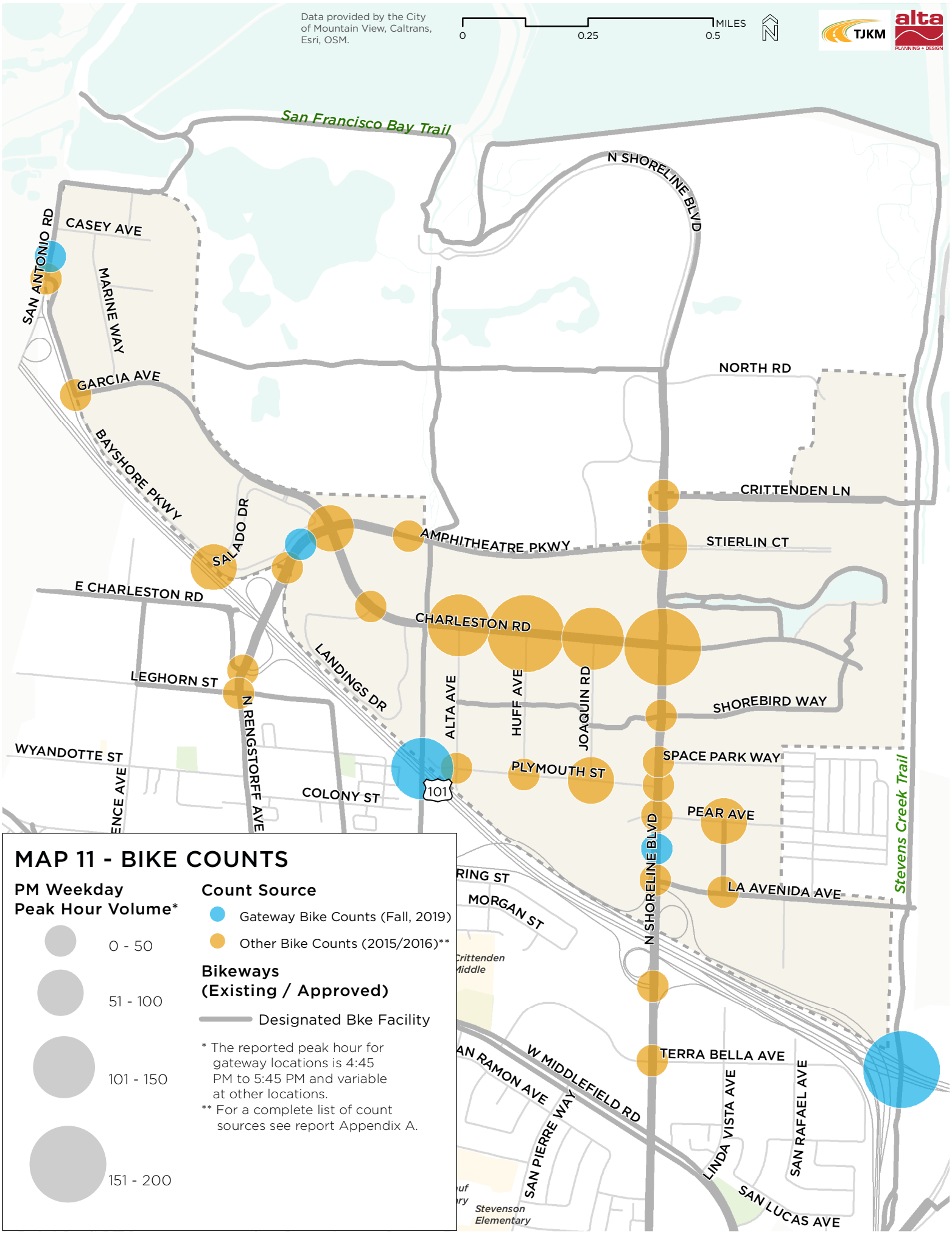
- Gateway Pedestrian Counts (Fall, 2019)
- Other Pedestrian Counts (2015/2016)**

Pedestrian Facilities (Existing/Approved)

- Class I Trail or Sidewalk on Both Sides of Roadway

* The reported peak hour for gateway locations is 9:00 AM to 10:00 AM and variable at other locations.

** For a complete list of count sources see report Appendix A.



MAP 11 - BIKE COUNTS

PM Weekday Peak Hour Volume*

- 0 - 50
- 51 - 100
- 101 - 150
- 151 - 200

Count Source

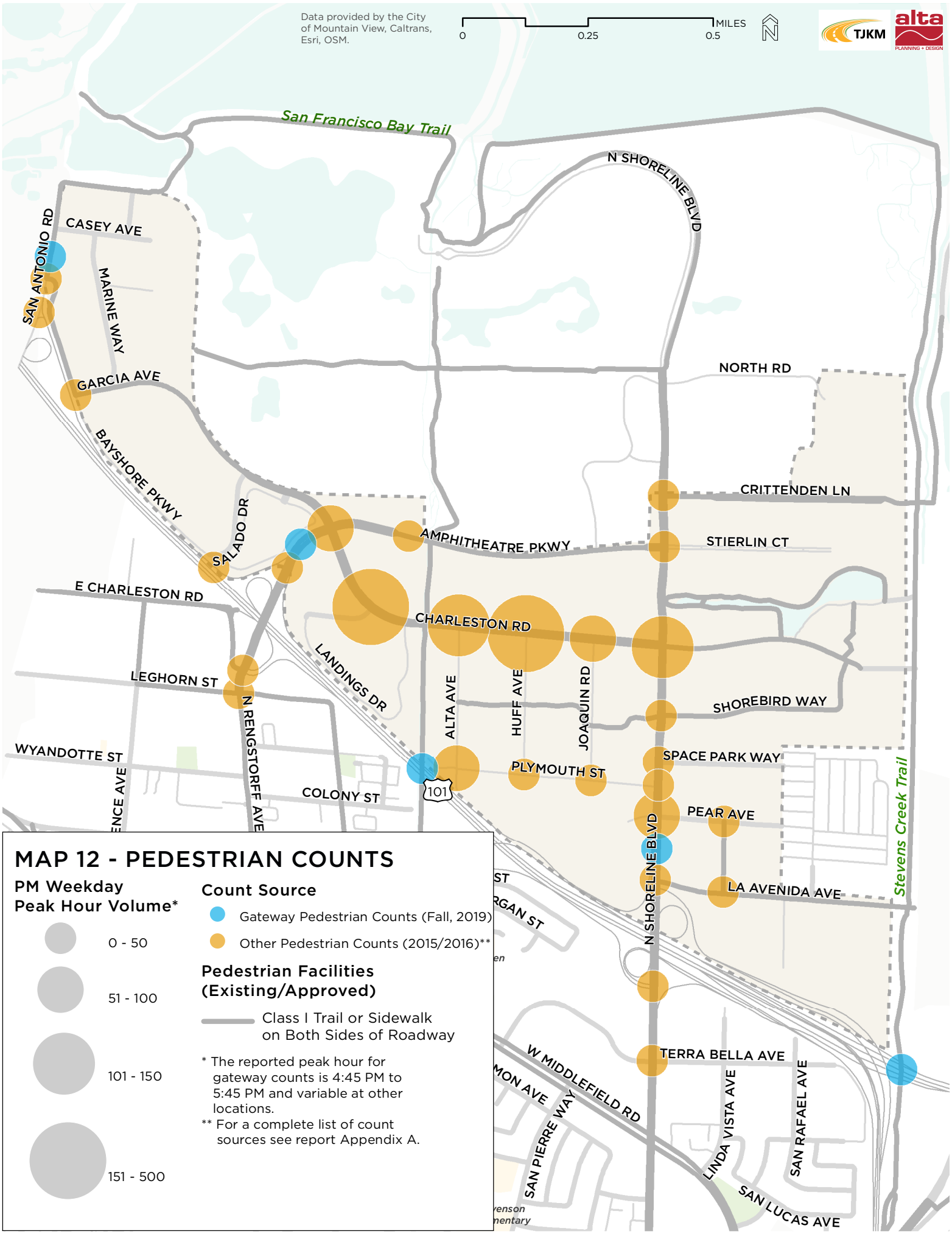
- Gateway Bike Counts (Fall, 2019)
- Other Bike Counts (2015/2016)**

Bikeways (Existing / Approved)

- Designated Bke Facility

* The reported peak hour for gateway locations is 4:45 PM to 5:45 PM and variable at other locations.

** For a complete list of count sources see report Appendix A.



MAP 12 - PEDESTRIAN COUNTS

PM Weekday Peak Hour Volume*

- 0 - 50
- 51 - 100
- 101 - 150
- 151 - 500

Count Source

- Gateway Pedestrian Counts (Fall, 2019)
- Other Pedestrian Counts (2015/2016)**

Pedestrian Facilities (Existing/Approved)

- Class I Trail or Sidewalk on Both Sides of Roadway

* The reported peak hour for gateway counts is 4:45 PM to 5:45 PM and variable at other locations.

** For a complete list of count sources see report Appendix A.

Network-Based Activity Assessment

Existing and Future Flow Estimation Methods

The methods used to estimate existing and future flows utilize similar methodologies and are both explained in this section for simplicity. For a more detailed description of methods, see Appendix D and Appendix F.

Generation of Estimated Existing and Future Flows

Estimated existing and future bicycle and pedestrian flows were generated using data from the following sources:

- Roadway and trail network extracted from Open Street Map (OSM)
- Existing bicycle and pedestrian infrastructure
- Origin-destination travel activity data from Metropolitan Transportation Commission (MTC) travel demand model
- Network travel experience (perceived distance adjustment factors)
- Future housing and employment estimates from Valley Transportation Authority (VTA)
- Future housing and employment (microzone) estimates for North Bayshore from the City of Mountain View
- Observed bicycle and pedestrian counts (flow calibration data) in North Bayshore
- Estimates of future bus, bicycle, and pedestrian activity in the Charleston corridor

Existing Flow Methods

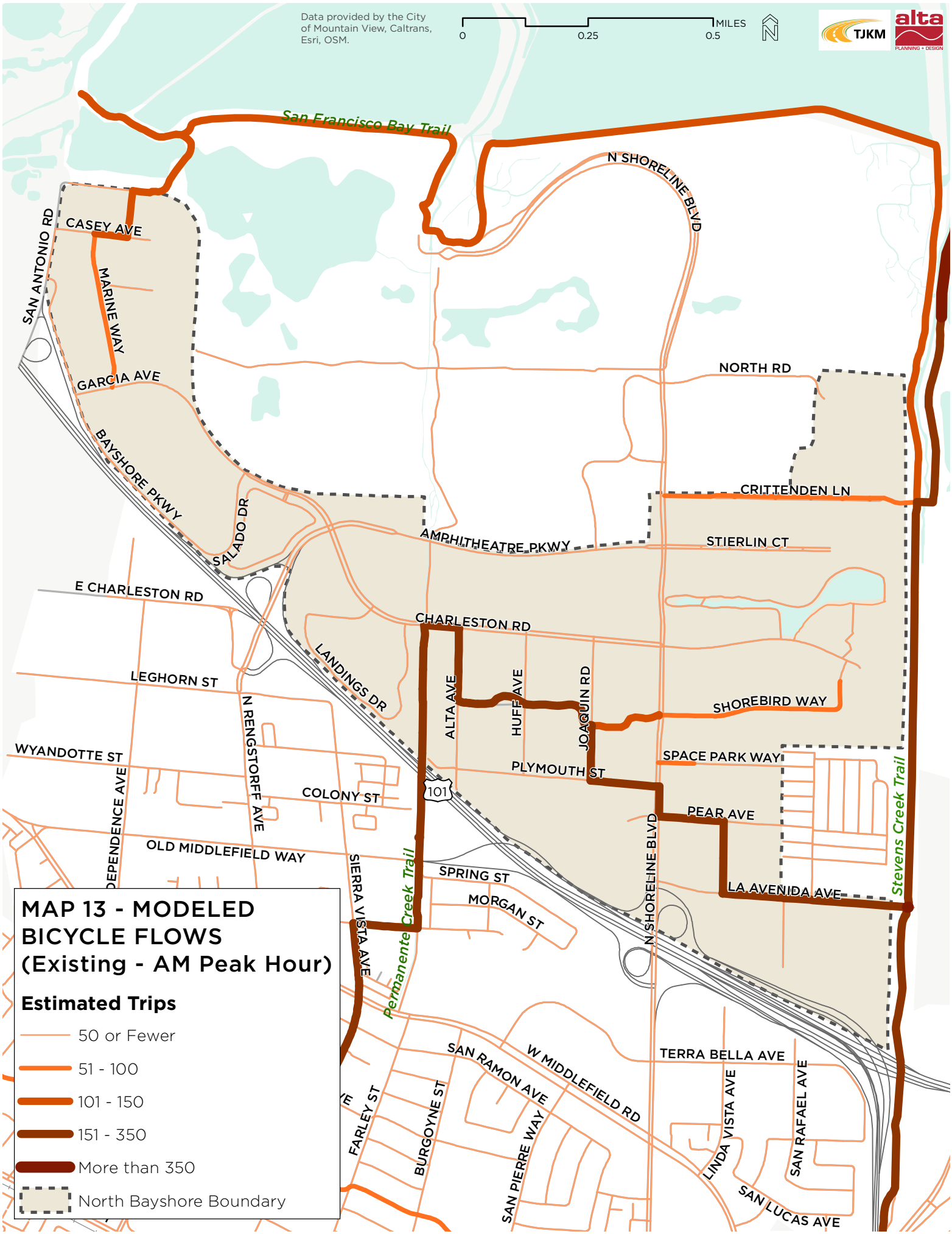
The MTC travel demand model provides flow estimates between large Transportation Analysis Zones (TAZs). In order to more precisely estimate activity in North Bayshore, the MTC TAZs were subdivided into microzones based on data from VTA and the City of Mountain View. Flows between zones were calculated using the MTC trip tables that represent both 2015 and 2040 development conditions. This resulted in modeling scenarios that were used in sensitivity testing. Flows from the baseline scenario were mapped to the roadway and trail network and the shortest path between origins and destination pairs was calculated. The shortest path distances were calculated using perceived distance travel adjustment factors that take the user experience into account. Finally, the estimated flows were calibrated using observed bicycle and pedestrian counts. Further, forecasts of future bus ridership provided by the client allowed Alta to add access and egress pedestrian activity to scenarios representing future conditions. Because comparable transit data were not available for existing conditions, pedestrian activity from transit access and egress was not explicitly included in the 'existing' scenarios.

Future Flow Methods

A statistical model was used to estimate relationships between perceived travel distance, which takes safety into account, and bicycle and pedestrian mode share. These relationships were used to estimate how changes to perceived travel distance due to infrastructure improvements affect future bicycle and pedestrian mode share. Using 2015 as the base year and 2040 as the future forecast year, several scenarios were developed to understand the change in estimated activity both due to installation of new infrastructure as well as growth in population and employment numbers and supportive TDM measures. The final estimates were mapped onto the network and calibrated against observed bicycle and pedestrian counts using the same methods employed to map existing flows to the network. A final step was to add a factor accounting for people arriving by transit. The estimated future flows were then used as an input into the facility capacity analysis.

Results - Estimated Existing Bicycle and Pedestrian Activity

Estimated bicycle and pedestrian flows for 2015 are shown on maps on the following pages. Maps 13 and 14 divide the estimated flows into a series of numeric categories and map the results using color gradation and line thickness. The Stevens Creek and Permanente Creek Trails both show higher bicycle and pedestrian activity estimates than other gateway locations; it is predicted that more than 150 bicyclists and more than 50 pedestrians enter North Bayshore via these routes during the peak AM hour. Modeled bicycle activity estimates are higher than pedestrian estimates, which is due largely to the longer commute trip that can be made by bicycle and the current lack of residential units in the district which limits walk-to-work opportunities.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LA AVENIDA AVE
Stevens Creek Trail
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SAN RAMON AVE
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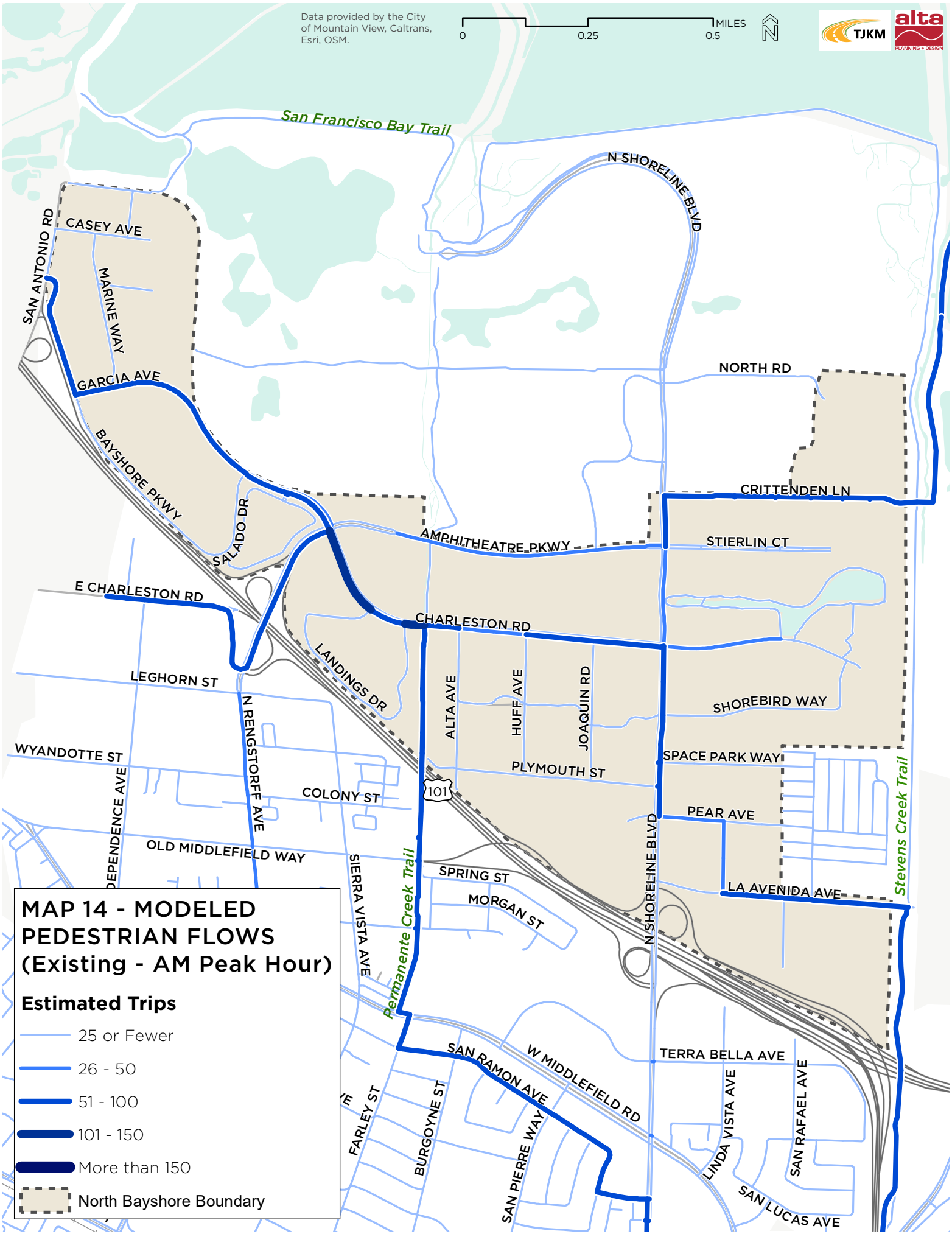
FARLEY ST
BURGOYNE ST
SAN PIERRE WAY
LINDA VISTA AVE
SAN RAFAEL AVE
SAN LUCAS AVE
MAP 13 - MODELED BICYCLE FLOWS (Existing - AM Peak Hour)
Estimated Trips
50 or Fewer
51 - 100
101 - 150
151 - 350
More than 350
North Bayshore Boundary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LINDA VISTA AVE
SAN RAFAEL AVE
SAN LUCAS AVE
MAP 14 - MODELED PEDESTRIAN FLOWS (Existing - AM Peak Hour)
Estimated Trips
25 or Fewer
26 - 50
51 - 100
101 - 150
More than 150
North Bayshore Boundary

Results - Estimated Future Bicycle and Pedestrian Activity

Alta developed a series of scenarios to estimate how infrastructure improvements and transportation demand management (TDM) would likely affect bicycle and pedestrian traffic in the context of expected growth within North Bayshore. The degree to which mode shares could be attributed to individual factors could then be analyzed by comparing scenarios.

On their own, population and land use changes incorporated into the 2040 projection for the MTC travel demand model forecast substantial growth in use of active modes—110% growth in walking and 255% growth in bicycling—compared with a 2015 baseline.

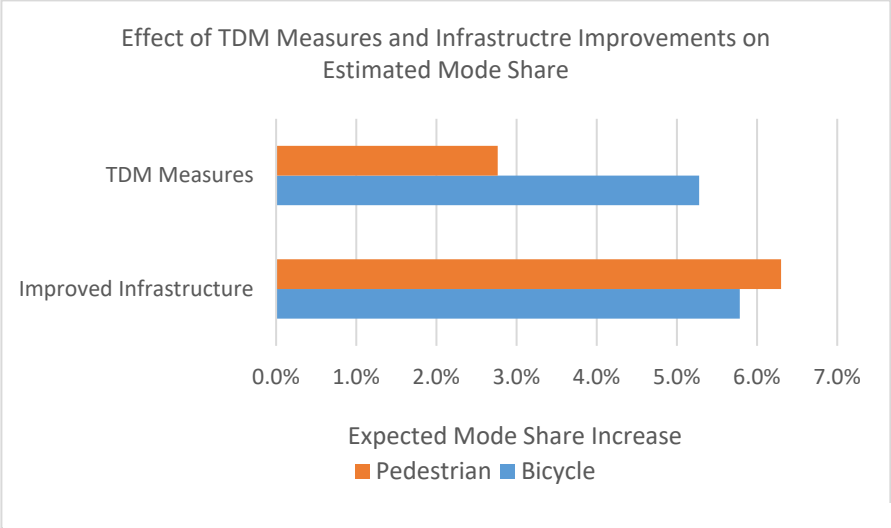


Figure 1. Effects of infrastructure improvements and TDM measures on pedestrian and bicycle mode share

Alta also modeled how infrastructure improvements might affect walking and bicycling by providing more direct and attractive routes for these users. These models predict additional growth up to 6.3% in walking and 5.8% in bicycling.

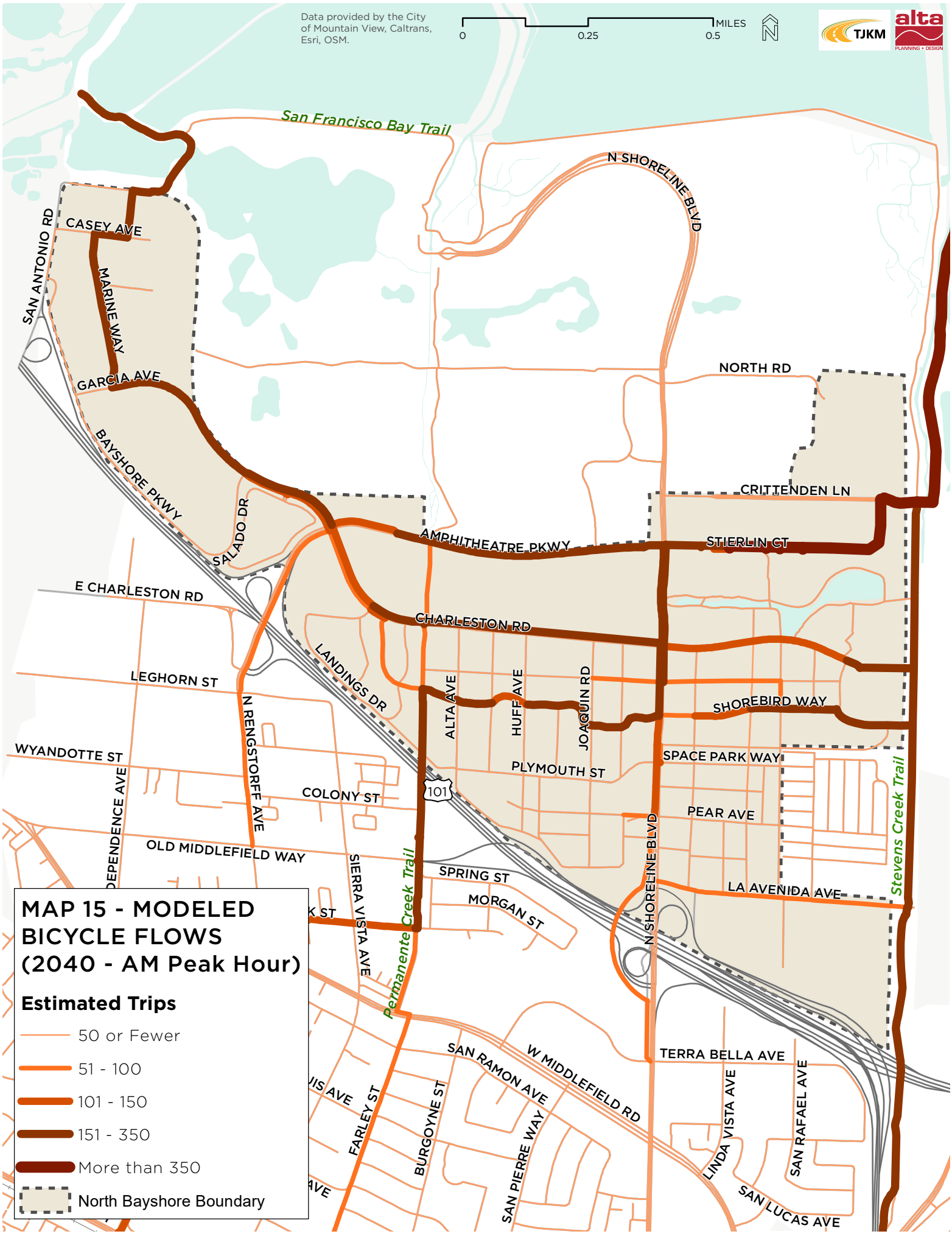
Finally, Alta modeled how TDM measures that increase bicycle and pedestrian commute mode share to at least ten percent, or non-work mode share to at least 25 percent, would further increase overall walking and bicycling mode share. Walking trips were projected to increase by 2.8% and bicycling by 5.3%. The increases were lower for walking because so many areas of North Bayshore are already projected to have high rates of walking in future development scenarios.

Overall, this scenario modeling indicated growth in North Bayshore walking and bicycling trips on the order of 300% and 150% respectively by 2040 compared with a 2015 baseline. This projected growth may be attributable to infrastructure improvements and TDM programs, as well as population increase and land use changes, particularly the introduction of more mixed land uses that bring residential units within walkable and bikeable distances of workplaces and commercial areas.

Results of Future Network Analysis

Future bicycle and pedestrian flows for 2040 are shown on maps on the following pages. Maps 15 and 16 use the same categories to illustrate the estimated future flows to capture the increased walking and bicycling activity that is anticipated on various network links. Bicycling activity is expected to increase significantly at most gateway locations, with the trails experiencing the greatest volume increase. Bicyclists using the Bay Trail to access North Bayshore will enter the roadway network at Marine Way and travel along Garcia Avenue and Charleston Road into the heart of the District, turning this route into a major bicycling corridor. Shorebird Way, Charleston Road, and Stierlin Court will serve the same role as major bicycling routes for the Stevens Creek Trail and are expected to see a high number of bicyclists. La Avenida Avenue, which experiences heavy bicycle use today, is expected to carry a lower number of bicyclists and become a more minor bicycling route due to planned infrastructure enhancements along major corridors and new formalized trail connections that are planned at Charleston Road and Shorebird Way, causing bicyclists to divert to these routes. Bicyclists entering North Bayshore via the Permanente Creek Trail will utilize the Google Green Loop to access the roadway network at a number of points, meaning that no one route is expected to carry the bulk of this traffic. Bicyclists are also expected to utilize the new bicycle-pedestrian bridge at Shoreline Boulevard and a moderate increase of bicycling activity is expected at Rengstorff Avenue, although the activity at both gateways is expected to be lower than the Permanente Creek Trail and the Stevens Creek Trail gateways. It is also important to note that the increased bicycling activity on Rengstorff Avenue assumes the addition of a Class I or Class IV facility as part of the planned interchange upgrade project. Installation of a Class II facility would likely result in lower estimated bicycle activity. Major east-west bicyclist circulation within North Bayshore is expected to occur via the Google Green Loop, Charleston Road, and Amphitheatre Parkway.

Overall, most roadways in North Bayshore are expected to see some increase in pedestrian activity. While significant pedestrian activity increases are expected along the Stevens Creek Trail and Permanente Creek Trail, major activity increases are also expected to result from pedestrians arriving via transit and the addition of up to 10,000 new housing units in North Bayshore. These factors combined result in the estimated activity increases shown on Charleston Road, the Google Green Loop, North Shoreline Boulevard, Alta Avenue, Huff Avenue, and Joaquin Road near the Shoreline Gateway development located south of Plymouth Street. Some increase in pedestrian-transit activity is also expected near the Intuit campus located off Marine Way. Pedestrian activity estimates for this area are dependent upon the location of future transit stops. The analysis also shows an increase in estimated pedestrian activity at the North Shoreline Boulevard and Rengstorff Avenue gateways, albeit in lower numbers.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Stevens Creek Trail
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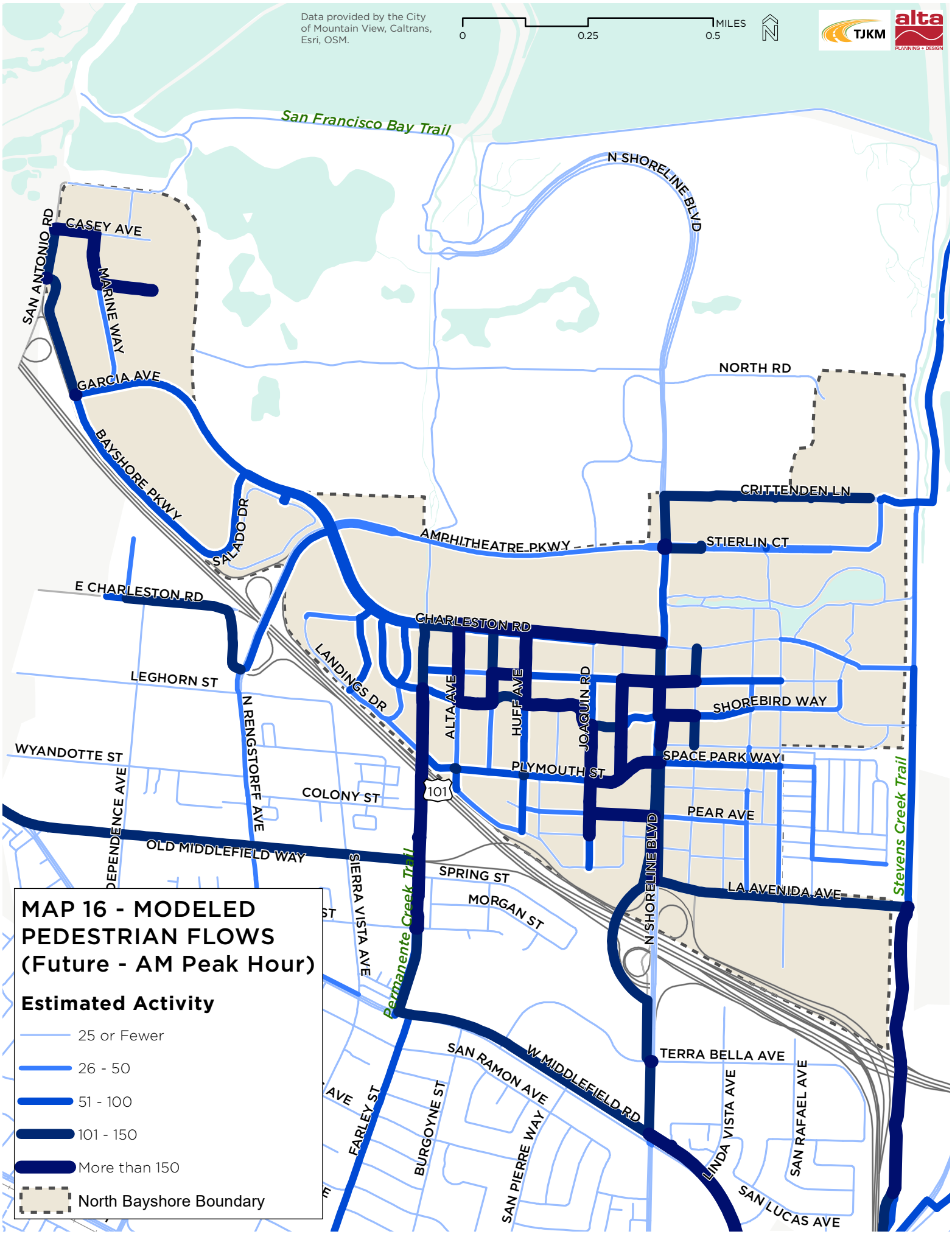
TERRA BELLA AVE
SAN RAMON AVE
W MIDDLEFIELD RD
FARLEY ST
BURGOYNE ST
SAN PIERRE WAY
LINDA VISTA AVE
SAN RAFAEL AVE
SAN LUCAS AVE
MAP 15 - MODELED BICYCLE FLOWS (2040 - AM Peak Hour)
Estimated Trips
50 or Fewer
51 - 100
101 - 150
151 - 350
More than 350
North Bayshore Boundary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LINDA VISTA AVE
SAN RAFAEL AVE
SAN LUCAS AVE
MAP 16 - MODELED PEDESTRIAN FLOWS (Future - AM Peak Hour)
Estimated Activity
25 or Fewer
26 - 50
51 - 100
101 - 150
More than 150
North Bayshore Boundary

Capacity Analysis

Capacity Analysis Methods

Several techniques were used to assess future facility capacity in 2040. Using future estimated flows and facility width information drawn from relevant plans, a volume-to-capacity (v/c) ratio was calculated for each bicycle facility segment, and Level of Service (LOS) values were calculated for each sidewalk and multi-use trail segment. A variety of techniques were used to calculate the LOS values based on the type of facility and user. Results were assessed for the AM peak hour, when the heaviest flows of users are expected. This assumption is based on observed trip volumes from the quarterly North Bayshore Traffic Monitoring Reports. See Appendix E for a list of assumptions associated with each analysis technique.

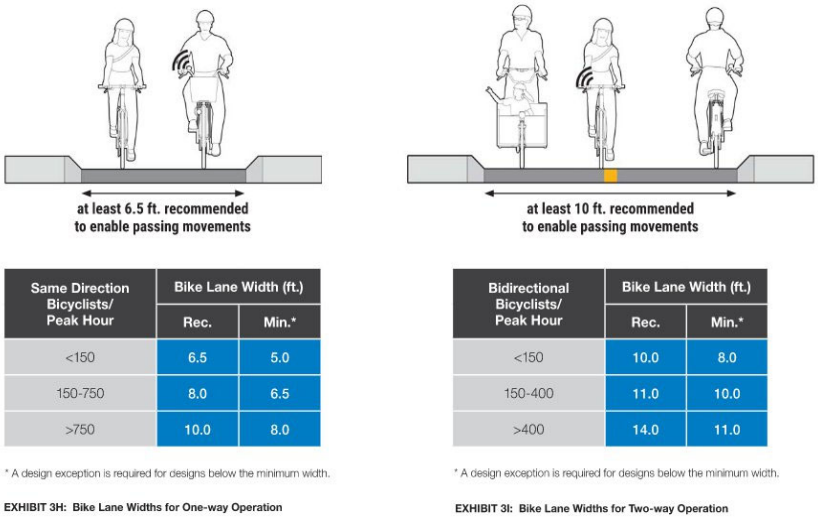
Pedestrian Sidewalk Capacity Analysis

The method used to assess sidewalk capacity is based on the *2010 Highway Capacity Manual Chapter 17 Urban Street Segments* and *National Cooperative Highway Research Program Report (NCHRP) 616: Multimodal Level of Service Analysis for Urban Streets*. The pedestrian capacity analysis considers the amount of space that users have to move freely along a sidewalk facility and does not consider other elements of the pedestrian experience such as street trees and pedestrian-scale lighting. However, the capacity LOS is useful when assessing whether the proposed sidewalks provide adequate width. The pedestrian LOS values presented are based on the average square footage per person during the peak hour.

Bicycle Capacity Analysis

The bicycle capacity analysis is based on the MassDOT *Separated Bike Lane Planning & Design Guide*, exhibits 3H and 3I, and reported as v/c ratios, which are based on the facility widths and capacities shown in Figure 2. The bicycle capacity analysis uses the following assumptions:

- When both a striped bike lane and cycle track are available options, 90% of people biking will opt for the cycle track
- Modeled flows are not split 50/50 by direction, but rather 100% of flow is assumed to travel in the same direction (e.g., northbound to work during the AM peak)



Same Direction Bicyclists/ Peak Hour	Bike Lane Width (ft.)	
	Rec.	Min.*
<150	6.5	5.0
150-750	8.0	6.5
>750	10.0	8.0

* A design exception is required for designs below the minimum width.

EXHIBIT 3H: Bike Lane Widths for One-way Operation

Bidirectional Bicyclists/ Peak Hour	Bike Lane Width (ft.)	
	Rec.	Min.*
<150	10.0	8.0
150-400	11.0	10.0
>400	14.0	11.0

* A design exception is required for designs below the minimum width.

EXHIBIT 3I: Bike Lane Widths for Two-way Operation

Figure 2. Bicyclist user flows and associated recommended facility widths. Source: MassDOT Separated Bike Lane Planning & Design Guide.

The Bicycle Shared-Use Path Level of Service, based on *HCM 2010 Chapter 23 Off-Street Pedestrian and Bicycle Facilities*, and was calculated using the Federal Highway Administration (FHWA) Shared Use Path Level of Service Calculator to produce a score and corresponding grade of A to F that quantifies the user experience. LOS A represents optimal conditions, LOS B and C represent some conflicts, and LOS D, E, and F represent conditions that include reduced travel speeds and a diminished user experience for people biking. The inputs into the LOS calculation include facility width, number (and type) of users, average travel speeds, centerline striping, and the assumed directional split. The primary considerations of the analysis are pathway width and directional split of traffic. These factors affect the ability of bicyclists to pass each other easily without having to change speed or trajectory. As the number of users increases and the pathway narrows, the number of passing events a bicyclist experiences increases along with difficulty of passing.

Pedestrian Shared-Use Path Level of Service

The Pedestrian Shared-Use Path Level of Service is also based on *HCM 2010 Chapter 23 Off-Street Pedestrian and Bicycle Facilities*. The pedestrian LOS is calculated based on the number of people walking during the peak hour, average walking and biking speeds, and the assumed directional split. LOS grades are presented on a similar A to F scale that quantifies the user experience. LOS A corresponds to optimal conditions, LOS B represents few pedestrian/bicyclist conflicts, LOS C represents conditions where it is difficult to walk two abreast, while LOS D, E, and F represent conditions with frequent user conflicts that result in disrupted travel as well as a diminished pedestrian experience. The primary considerations of this analysis are the number of encounters between pedestrians and bicyclists and the ease of passing which is facilitated by a wider path. Figure 3 shows the number of effective lanes for a given range of pathway widths. A pathway width of 8 to 10.5 feet will allow comfortable passing of only two parties. A pathway width of 11 feet allows multiple groups to pass simultaneously, which can have a substantial impact on level of service.

Path Width (ft)	Lanes
8.0–10.5	2
11.0–14.5	3
15.0–20.0	4

Source: Hummer et al. (7).

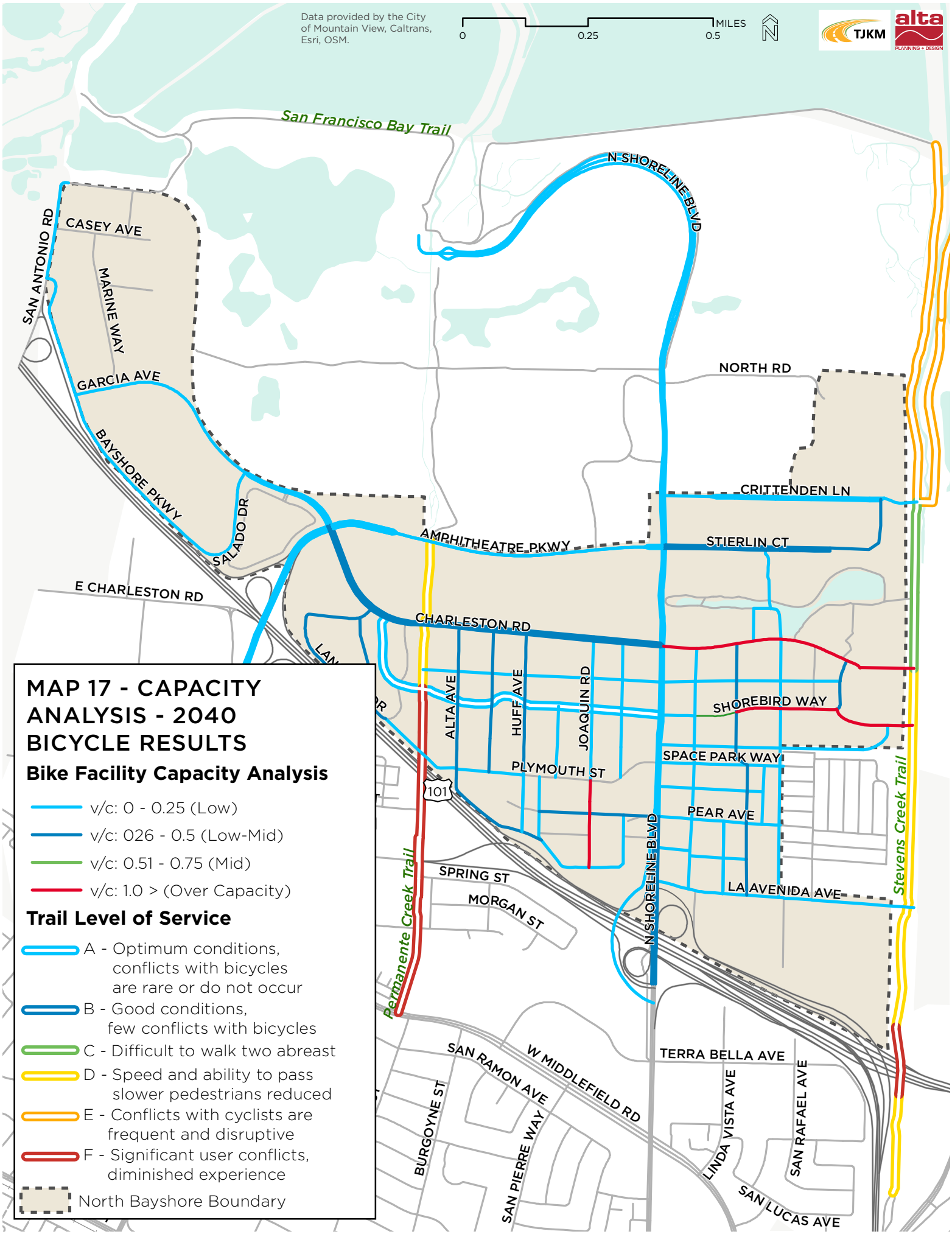
Exhibit 23-14
Effective Lanes by Path Width

Figure 3. Path width and number of effective lanes. Source: HCM 2010 Chapter 23 Off-Street Pedestrian and Bicycle Facilities.

Capacity Analysis Results

Preliminary findings for future capacity assessment are presented on Map 17 and 18. The pedestrian capacity analysis found that all sidewalks have sufficient capacity (see Map 18). The Green Loop has a high level of bicycle and pedestrian service. Potential capacity problems exist on the much of the Stevens Creek Trail and portions of the Permanente Creek Trail, where projected increases in bicycle and pedestrian flows will likely lead to increased user conflicts and a diminished pedestrian user experience. Other opportunities for crossing improvements are shown on preliminary recommendations maps attached to this memorandum.

The bicycle capacity analysis results show more variability (see Map 17). The majority of Class II, III and IV facilities are below a v/c ratio of 1.0 and will provide bicyclists with a comfortable travel experience. There are some facilities that are near or over a v/c ratio of 1.0 and people biking will face a diminished user experience on these segments. The roadways that are projected to be over capacity include Terminal Boulevard, portions of Charleston Road, Marine Way, the planned public plaza at the southern end of Joaquin Road, portions of Shorebird Way, and Broderick Way. Bicyclists will also likely experience crowded travel conditions and a degraded LOS on the Permanente Creek Trail. Stevens Creek Trail is also over capacity with the exception of the section between Crittenden Lane and Charleston Road, which has a LOS C. This section of the trail sees lighter bicycle flows due to the number of southbound users exiting the trail system at Crittenden and the number of northbound users exiting onto the roadway network at La Avenida Avenue, Shorebird Way, and Charleston Road.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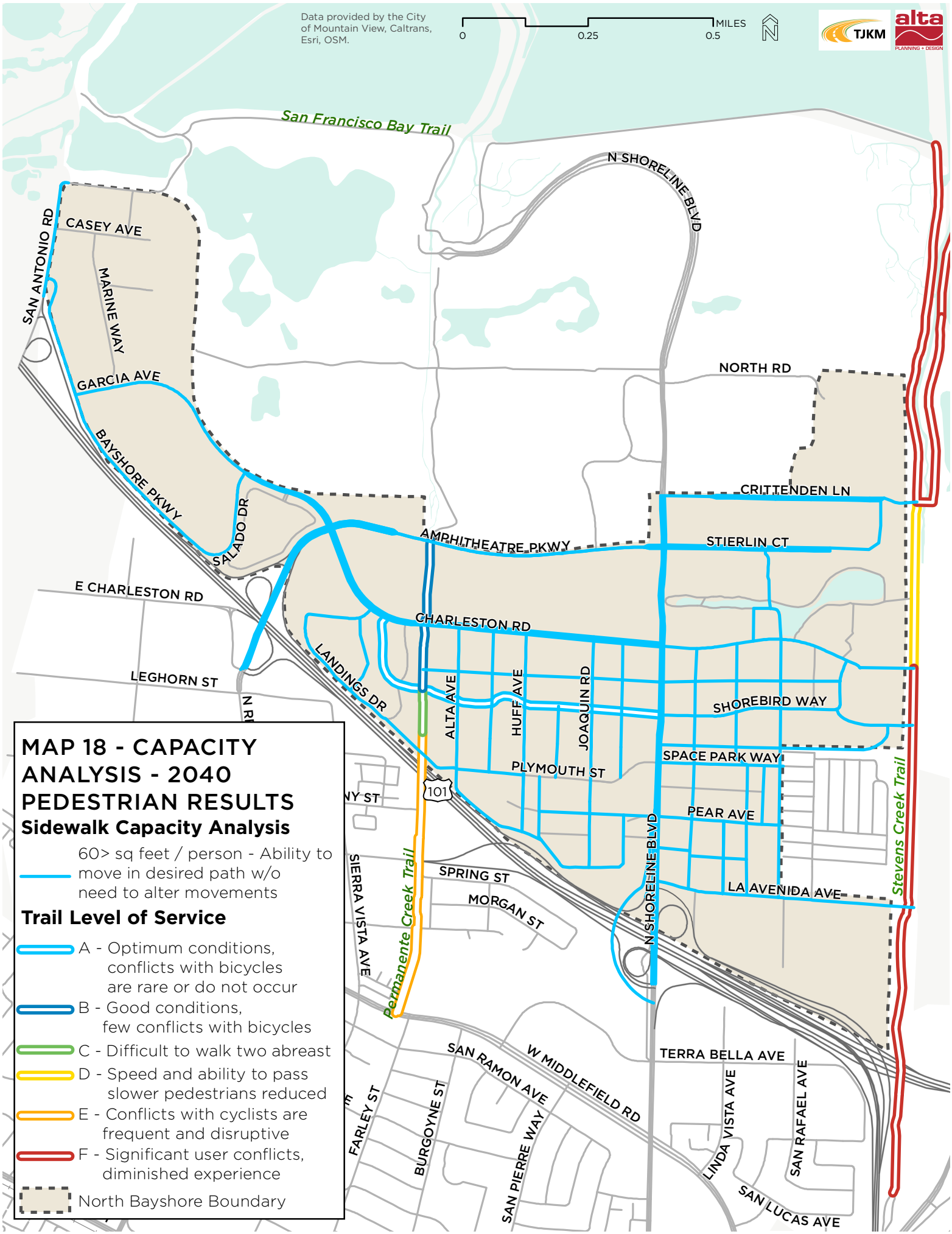
MAP 17 - CAPACITY ANALYSIS - 2040 BICYCLE RESULTS
Bike Facility Capacity Analysis
v/c: 0 - 0.25 (Low)
v/c: 026 - 0.5 (Low-Mid)
v/c: 0.51 - 0.75 (Mid)
v/c: 1.0 > (Over Capacity)
Trail Level of Service
A - Optimum conditions, conflicts with bicycles are rare or do not occur
B - Good conditions, few conflicts with bicycles
C - Difficult to walk two abreast
D - Speed and ability to pass slower pedestrians reduced
E - Conflicts with cyclists are frequent and disruptive
F - Significant user conflicts, diminished experience
North Bayshore Boundary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MAP 18 - CAPACITY ANALYSIS - 2040 PEDESTRIAN RESULTS
Sidewalk Capacity Analysis
60> sq feet / person - Ability to move in desired path w/o need to alter movements
Trail Level of Service
A - Optimum conditions, conflicts with bicycles are rare or do not occur
B - Good conditions, few conflicts with bicycles
C - Difficult to walk two abreast
D - Speed and ability to pass slower pedestrians reduced
E - Conflicts with cyclists are frequent and disruptive
F - Significant user conflicts, diminished experience
North Bayshore Boundary

Infrastructure Recommendations

The North Bayshore Precise Plan, the foundational blueprint for development in North Bayshore, already includes robust bicycle and pedestrian infrastructure recommendations. The bicycle and pedestrian recommendations presented here refine those recommendations. These refinements are presented in the maps accompanying this memorandum. The maps contain the current planned facility or spot recommendations, recommended capacity enhancements for over-capacity corridors, additional point-specific recommendations that were identified during the capacity analysis, and several potential new connections that could be created to further enhance the bicycle and pedestrian network. While the Precise Plan and these recommendations lay out a path forward that can lead to a world-class bicycling and pedestrian experience, the ultimate challenge lies in implementation of these plans. For example, the Precise Plan and the refinements recommended here includes wide sidewalks and bicycle facilities that do not currently exist in roadway cross sections. Roadway reconfiguration completed in conjunction with new construction is critical for full implementation of the Precise Plan.

Based on the capacity analysis, the Alta team recommends retaining most infrastructure recommendations as is. Wider facilities have the potential to increase user comfort and provide a higher quality experience. Recommended changes are detailed below and illustrated on Maps 19 and 20- and Tables 1 and 2.

- **Increase minimum sidewalk widths from five feet to six feet on all roadways within the Access Street functional class.** While the Precise Plan calls for six-foot wide sidewalks for most roadways, a five-foot sidewalk is recommended when roadways are classified as Access Streets. A minimum six-foot sidewalk is recommended whenever sidewalks are constructed or reconstructed to help facilitate a world-class pedestrian experience in North Bayshore regardless of the roadway classification.

- **Ensure ADA accessibility of existing infrastructure.** Older existing sidewalks, bridges, and trails that were built prior to the adoption of the ADA may not meet current accessibility standards and should be checked for compliance. For example, planning is underway for upgrades of the bicycle and pedestrian bridge across Stevens Creek at Crittenden Lane.

- **Increase bicycle capacity on Charleston Road and Shorebird Way.** As mentioned above, over-capacity bicycle facilities include portions of Charleston Road and portions of Shorebird Way. An increase in bicycle capacity is recommended to maintain a high-quality user experience. This could be accomplished through increasing facility width or improvement of parallel routes.

- **Monitor bicycle volumes along Access Streets that are projected to be over capacity.** The modeled results indicate that several Access Streets including Marine Way, Terminal Boulevard and Broderick Way may be over capacity during the AM peak hour. The facility would be adequate for most of the day but may experience crowding during peak conditions spilling out into the adjacent travel lanes. To safely accommodate increased numbers of bicyclists, peak hour volumes along the planned bike facilities should be monitored over time to identify where and when additional roadway modifications should occur. It is recommended that the painted bike lanes that are planned for the identified Access Streets also include a painted buffer to better accommodate the anticipated increase in volumes. Any protective features located within the buffer area should be permeable to bicyclists to allow for passing of other bicyclists, if the operating width of the bikeway is 6' or less.

- **Provide connections to the east of North Bayshore.** North Bayshore would benefit from improved connections to Moffett Park to the east. Key connection points already under consideration or study for near- to mid-term improvements include a new bridge across Stevens Creek south of La Avenida Street, upgrades to the existing bridge at Crittenden Lane and construction of a bicycle / pedestrian bridge at Charleston Road.

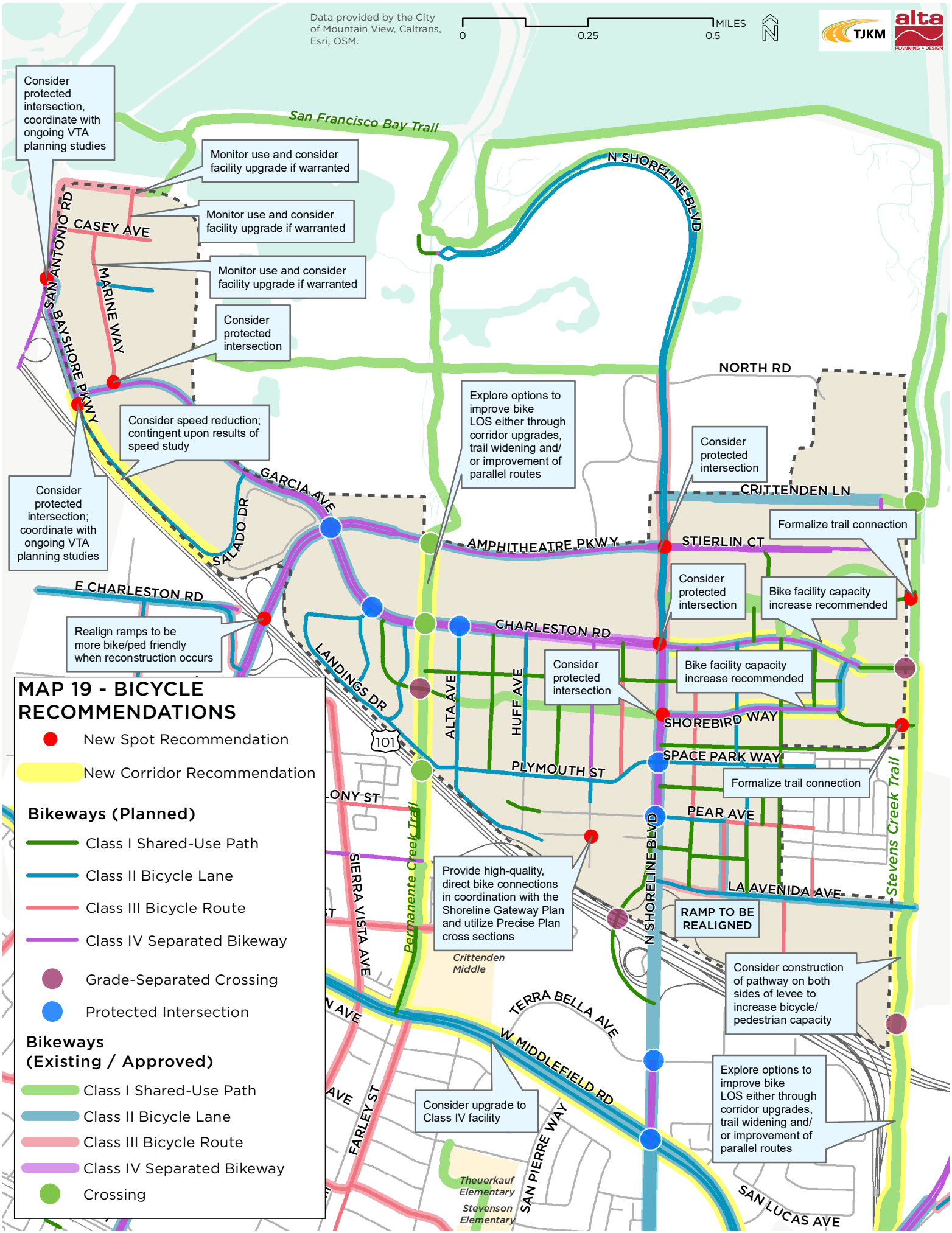
- **Provide connections to the west of North Bayshore.** North Bayshore will benefit from improved connections to Palo Alto. For example, the current planning of improvements to the crossing of Adobe Creek should be coordinated with improvements undertaken as part of the Precise Plan. The City should also coordinate with work currently underway by the VTA to upgrade the San Antonio Road / US 101 interchange.

- **Refine current Precise Plan bicycle recommendations on key corridors to better reflect projected demand.** There were several areas where significant excess bicycle capacity was observed and the potential to reduce the capacity exists if facilities have not yet been constructed. These conditions exist along Amphitheatre Parkway, Charleston Road, Bayshore Parkway (where designated as a Transit Boulevard), and Shoreline Boulevard (where designated as a Gateway Boulevard). This excess capacity does not create any problems but it may represent an opportunity for cost efficiencies to save money as the projected flows do not seem to require the planned facility type at these locations. For example, rather than recommending construction of two-way cycle tracks on both sides of Amphitheatre Parkway, the section could be modified to construct a single two-way cycle track or construct one-way cycle tracks on each side of the roadway. These modifications could adequately handle the projected flows of bicyclists and could represent cost savings that could be reallocated to other bicycle and pedestrian improvements elsewhere within North Bayshore.

- **Consider corridor upgrades to increase existing trail capacity.** A key finding of the capacity analysis is the expected low LOS for bicyclists and pedestrians on many portions of the Stevens Creek and Permanente Creek Trails. For pedestrians, the degraded LOS is primarily driven by trail width and the number of expected meetings with bicyclists. For bicyclists, the lower levels of service are driven by the expected increase in number of users and the current trail width, which limits the number of users that can pass each other at one time and leads to user delay. One simple recommendation to improve the bicycle LOS includes the removal of the pathway centerline striping. Striping removal will slightly improve the bicycle LOS by making bicyclists more willing to leave their demarcated lane when passing other users. Other potential strategies to improve flow on the existing trail include installation of comprehensive and consistent warning and wayfinding signs as well as consistent trimming of vegetation to maintain sightlines and pathway shoulders. Finally, on the Stevens Creek Trail, consider utilizing both sides of the levee to construct separated bicycle and pedestrian pathways. The construction of a parallel pathway would allow user flows to disperse and could substantially improve the user experience for both bicyclists and pedestrians, while increasing the overall transportation potential of the corridor. Construction of an additional trail would require the permission of the Santa Clara Valley Water District, which is currently opposed to the idea.

- **Explore opportunities for pathway widening and/or development of parallel routes.** It is also recommended that the city explore other alternatives to increase path capacity either through path widening or improvement of travel conditions along adjacent corridors such as improvement of parallel gravel maintenance roads to serve as pedestrian pathways. As another example, the new bicycle and pedestrian bridge planned for North Shoreline Boulevard could potentially serve trips that would have been made on either the Stevens Creek Trail or Permanente Creek Trail. Providing high quality connections, such as a Class IV facility along West Middlefield Road would allow users to easily access multiple gateways thus balance the bicycle or pedestrian traffic. The new bridge is also expected to support new trips generated by residential growth planned for the Terra Bella neighborhood.

- **Explore improved connections to the Terra Bella Neighborhood.** The Terra Bella Neighborhood, directly south of North Bayshore, is comprised of both residential and commercial land and is anticipated to continue redeveloping in response to the planned changes in North Bayshore. Specific development and detailed site planning for developments like the Shoreline Gateway should consider opportunities to construct high-quality bicycle and pedestrian connections both through the neighborhood and to North Bayshore. For example, construction of high-quality bicycle routes can promote intra-neighborhood trips and access to North Bayshore via the North Shoreline Boulevard bicycle and pedestrian bridge.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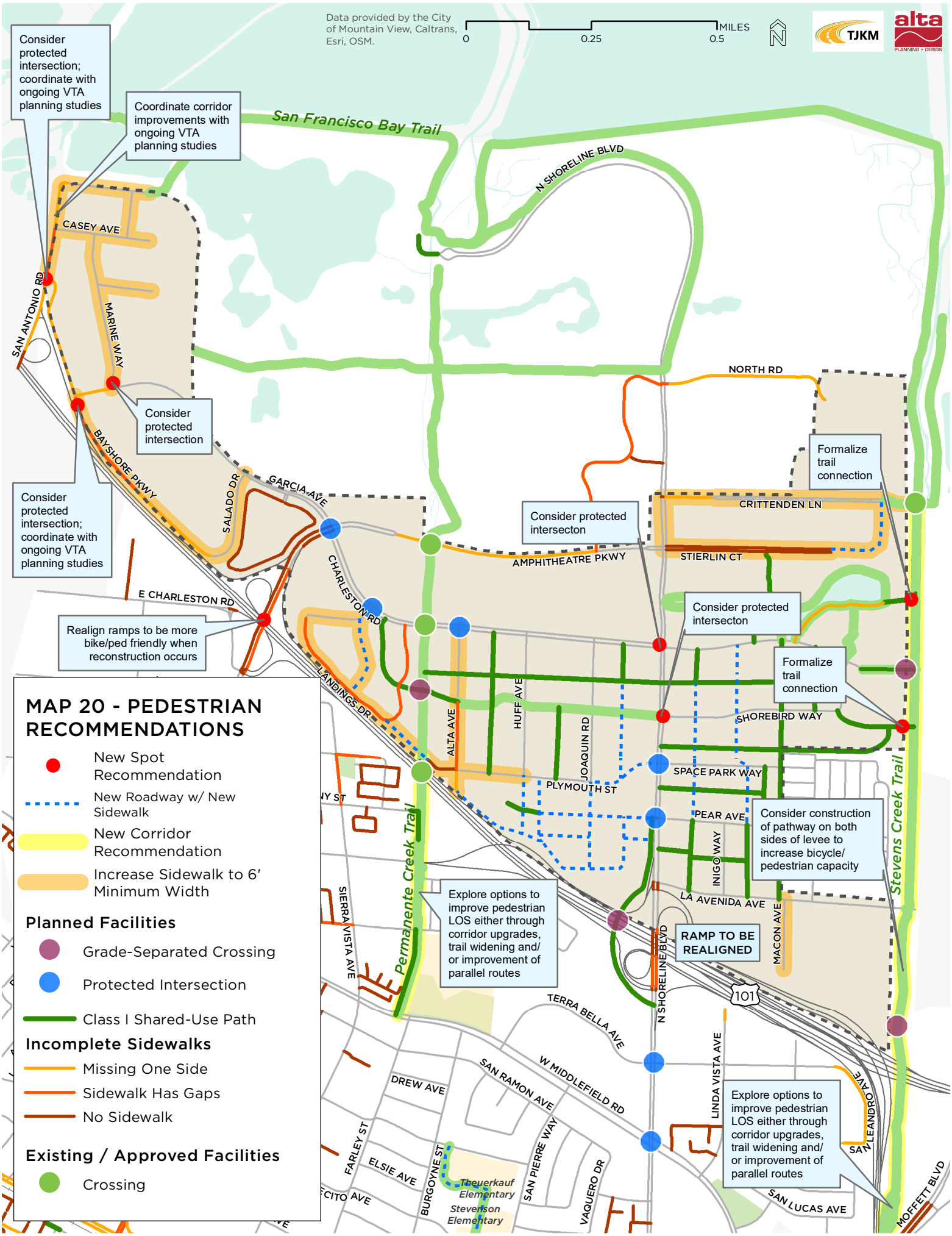
PLANNING + DESIGN
Consider protected intersection, coordinate with ongoing VTA planning studies
San Francisco Bay Trail
Monitor use and consider facility upgrade if warranted
Monitor use and consider facility upgrade if warranted
Monitor use and consider facility upgrade if warranted
Consider protected intersection
Consider speed reduction; contingent upon results of speed study
Consider protected intersection; coordinate with ongoing VTA planning studies
Realign ramps to be more bike/ped friendly when reconstruction occurs
Explore options to improve bike LOS either through corridor upgrades, trail widening and/ or improvement of parallel routes
Consider protected intersection
Formalize trail connection
Consider protected intersection
Bike facility capacity increase recommended
Consider protected intersection
Bike facility capacity increase recommended
Formalize trail connection
Provide high-quality, direct bike connections in coordination with the Shoreline Gateway Plan and utilize Precise Plan cross sections
RAMP TO BE REALIGNED
Consider construction of pathway on both sides of levee to increase bicycle/ pedestrian capacity
Consider upgrade to Class IV facility
Explore options to improve bike LOS either through corridor upgrades, trail widening and/ or improvement of parallel routes
N SHORELINE BLVD
CASEY AVE
SAN ANTONIO RD
MARINE WAY
BAYSHORE PKWY
GARCIA AVE
SALADO DR
E CHARLESTON RD
NORTH RD
CRITTENDEN LN
STIERLIN CT
AMPHITHEATRE PKWY
CHARLESTON RD
LANDINGS DR
ALTA AVE
HUFF AVE
SHOREBIRD WAY
SPACE PARK WAY
PLYMOUTH ST
PEAR AVE
LA AVENIDA AVE
Stevens Creek Trail
Permanente Creek Trail
SIERRA VISTA AVE
FARLEY ST
TERRA BELLA AVE
W MIDDLEFIELD RD
SAN PIERRE WAY
SAN LUCAS AVE
Crittenden Middle
Theuerkauf Elementary
Stevenson Elementary
101
MAP 19 - BICYCLE RECOMMENDATIONS
New Spot Recommendation
New Corridor Recommendation
Bikeways (Planned)
Class I Shared-Use Path
Class II Bicycle Lane
Class III Bicycle Route
Class IV Separated Bikeway
Grade-Separated Crossing
Protected Intersection
Bikeways (Existing / Approved)
Class I Shared-Use Path
Class II Bicycle Lane
Class III Bicycle Route
Class IV Separated Bikeway
Crossing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PLANNING + DESIGN
Consider protected intersection; coordinate with ongoing VTA planning studies
Coordinate corridor improvements with ongoing VTA planning studies
San Francisco Bay Trail
N SHORELINE BLVD
CASEY AVE
SAN ANTONIO RD
MARINE WAY
Consider protected intersection
BAYSHORE PKWY
Consider protected intersection; coordinate with ongoing VTA planning studies
SALADO DR
GARCIA AVE
NORTH RD
Formalize trail connection
CRITTENDEN LN
Consider protected intersecton
AMPHITHEATRE PKWY
STIERLIN CT
Consider protected intersecton
E CHARLESTON RD
CHARLESTON RD
Realign ramps to be more bike/ped friendly when reconstruction occurs
LANDINGS DR
Formalize trail connection
SHOREBIRD WAY
ALTA AVE
HUFF AVE
JOAQUIN RD
SPACE PARK WAY
PLYMOUTH ST
PEAR AVE
Consider construction of pathway on both sides of levee to increase bicycle/ pedestrian capacity
INIGO WAY
LA AVENIDA AVE
Stevens Creek Trail
Permanente Creek Trail
Explore options to improve pedestrian LOS either through corridor upgrades, trail widening and/ or improvement of parallel routes
RAMP TO BE REALIGNED
MACON AVE
N SHORELINE BLVD
101
TERRA BELLA AVE
SIERRA VISTA AVE
W MIDDLEFIELD RD
SAN RAMON AVE
DREW AVE
LINDA VISTA AVE
Explore options to improve pedestrian LOS either through corridor upgrades, trail widening and/ or improvement of parallel routes
SAN LEANDRO AVE
FARLEY ST
ELSIE AVE
BURGOYNE ST
Theuerkauf Elementary
Stevenson Elementary
SAN PIERRE WAY
VAQUERO DR
SAN LUCAS AVE
MOFFETT BLVD
MAP 20 - PEDESTRIAN RECOMMENDATIONS
New Spot Recommendation
New Roadway w/ New Sidewalk
New Corridor Recommendation
Increase Sidewalk to 6' Minimum Width
Planned Facilities
Grade-Separated Crossing
Protected Intersection
Class I Shared-Use Path
Incomplete Sidewalks
Missing One Side
Sidewalk Has Gaps
No Sidewalk
Existing / Approved Facilities
Crossing

Table 1. Spot and Intersection Recommendations

Mode	Intersection 1 (N/S)	Intersection 2 (E/W)	Recommendation
Bike/Ped	Bayshore Parkway	Garcia Avenue	Protected intersection, future planning should be coordinated with the VTA study of the San Antonio interchange
Bike	Gateway Park	Gateway Park	Provide high-quality, direct bike connections in coordination with the Shoreline Gateway Plan and utilize Precise Plan cross sections
Bike/Ped	Marine Way	Garcia Avenue	Protected intersection
Bike/Ped	North Rengstorff Avenue	Bayshore Freeway Onramps	Realign ramps to be more bike/ped friendly when reconstruction occurs
Bike/Ped	North Shoreline Boulevard	Amphitheatre Parkway	Protected intersection
Bike/Ped	North Shoreline Boulevard	Charleston Road	Protected intersection
Bike/Ped	North Shoreline Boulevard	Shorebird Way	Protected intersection
Bike/Ped	San Antonio Road	Bayshore Parkway	Protected intersection, future planning should be coordinated with the VTA study of the San Antonio interchange
Bike/Ped	Stevens Creek Trail	Fitness Trail	Formalize trail connection
Bike/Ped	Stevens Creek Trail	Shorebird Way	Formalize trail connection

Table 2. Corridor Recommendations

Mode	Corridor	From	To	Recommendation Details	Length (Mi)*
Ped	Alta Avenue	Charleston Road	Plymouth Street	Construct/reconstruct minimum 6' sidewalk	0.32
Bike	Bayshore Parkway	Garcia Avenue	Salado Drive	Consider speed reduction to reduce the speed differential between bicyclists and motor vehicles. This recommendation is contingent upon results of speed study.	0.42
Ped	Bayshore Parkway	Garcia Avenue	Salado Drive	Construct/reconstruct minimum 6' sidewalk	0.43
Ped	Broderick Way	Terminal Boulevard	Casey Avenue	Construct/reconstruct minimum 6' sidewalk	0.01
Ped	Casey Avenue	San Antonio Road	Eastern Terminus	Construct/reconstruct minimum 6' sidewalk	0.19
Bike	Charleston Road	North Shoreline Boulevard	Shorebird Way	Increase bicycle capacity	0.40
Ped	Coast Avenue	Marine Way	Eastern Terminus	Construct/reconstruct minimum 6' sidewalk	0.11
Ped	Crittenden Lane	North Shoreline Boulevard	Stevens Creek Access Point	Construct/reconstruct minimum 6' sidewalk	0.51
Ped	Landings Drive	Charleston Road (West)	Plymouth Street	Construct/reconstruct minimum 6' sidewalk	0.57
Ped	Macon Avenue	La Avenida Street	Southern Terminus	Construct/reconstruct minimum 6' sidewalk	0.14
Ped	Marine Way	Casey Avenue	Garcia Avenue	Construct/reconstruct minimum 6' sidewalk	0.31
Ped	North Shoreline Boulevard	Crittenden Lane	Stierlin Court	Construct/reconstruct minimum 6' sidewalk	0.10
Bike	Permanente Creek Trail	Amphitheatre Parkway	West Middlefield Road	Explore options to improve bike LOS either through trail widening or improvement of parallel routes	1.15
Ped	Permanente Creek Trail	Charleston Road	West Middlefield Road	Explore options to improve pedestrian LOS either through trail widening or improvement of parallel routes	0.56

Mode	Corridor	From	To	Recommendation Details	Length (Mi)*
Ped	Plymouth Street	Landings Drive	Huff Avenue	Construct/reconstruct minimum 6' sidewalk	0.18
Ped	Salado Drive	Garcia Avenue	Bayshore Parkway	Construct/reconstruct minimum 6' sidewalk	0.19
Ped	San Antonio Road	Terminal Boulevard	Bayshore Parkway	Construct/reconstruct minimum 6' sidewalk	0.20
Bike	Shorebird Way	Unconstructed Access Street	Informal Stevens Creek Access Point	Increase bicycle capacity	0.20
Bike	Stevens Creek Trail	Charleston Road	East Middlefield Road	Explore options to improve bike LOS either through trail widening or improvement of parallel routes	1.93
Ped	Stevens Creek Trail	Crittenden Lane	East Middlefield Road	Explore options to improve pedestrian LOS either through trail widening or improvement of parallel routes	1.93
Ped	Stierlin Court	North Shoreline Boulevard	Crittenden Lane	Construct/reconstruct minimum 6' sidewalk	0.52
Ped	Terminal Boulevard	San Antonio Road	Eastern Terminus	Construct/reconstruct minimum 6' sidewalk	0.16
Bike	West Middlefield Road	San Antonio Road	North Wishman Road	Consider upgrade to Class IV facility	2.19

* The length for sidewalk construction/reconstruction projects is given in terms of the corridor's roadway centerline. The actual amount of sidewalk requiring construction or reconstruction is dependent how much (if any) sidewalk is already present within the corridor that is six feet wide.