CANYON
DEL REY BLVD

CANYON DEL REY BOULEVARD (State Route 218) CORRIDOR STUDY

IN PARTNERSHIP WITH:

Caltrans

CITY OF SEASIDE CALIFORNIA

CITY OF DEL REY OAKS INCORPORATED 1953

CANYON DEL REY BOULEVARD (State Route 218) CORRIDOR STUDY

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Prepared for:
Transportation Agency for Monterey County

Prepared in partnership with:

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1. EXECUTIVE SUMMARY

Canyon Del Rey Boulevard/State Route 218 (SR 218), a Caltrans facility, is a west-east corridor that connects Route 1 (SR 1) and State Route 68 (SR 68). Major crossroads include Del Monte Boulevard, Fremont Boulevard, and General Jim Moore Boulevard. Land uses vary along the corridor and include commercial, residential, institutional, and open space with much of the corridor located within the Coastal Zone. The 2.85 mile corridor varies between two and four lanes with some raised medians or no medians at all. SR 218 is a four-lane facility within the City of Seaside and narrows to a two-lane facility just east of Safeway in Del Rey Oaks. The road has limited access to adjacent land uses and is primarily accessed via intersecting city streets. Some sidewalks and bicycle lanes exist, however, the extensive gaps make the roadway more accommodating for vehicular travel. Transit services are also provided with connections to the JAZZ Bus Rapid Transit line along North Fremont Boulevard. In the segment closer to SR 1 volumes are about 17,700 vehicles per day. In Del Rey Oaks, volumes are about 13,700 vehicles per day. Intersection controls vary from stop signs to signals. There are no four-way stop controlled intersections in the corridor. Speed limits fluctuate between 35 miles per hour in Seaside to 45 mph in Del Rey Oaks.

The goal of the Canyon Del Rey Boulevard (SR 218) Corridor Study is a preliminary planning study to improve safety, mobility, and access for all modes, particularly pedestrians and cyclists. To achieve this goal, several roadway improvements are recommended along the corridor. These recommendations incorporate the proposed Fort Ord Regional Trail and Greenway (FORTAG) which runs along segments of the SR 218 corridor.

The feasibility study was funded through a Caltrans Sustainable Planning Grant and led by the Transportation Agency for Monterey County (TAMC). The study was undertaken in close collaboration with the City of Seaside, City of Del Rey Oaks, and Caltrans District 5 with support from transportation planning consultants. Monterey Salinas Transit (MST) was consulted and significant input was provided by local residential and business communities along the corridor.

For the purposes of this study, the State Route 218 corridor has been sectioned into four segments based on roadway characteristics and adjacent land uses. **Figure E-1** presents the Study Area Map.

1. Route 1 to Sonoma Avenue
2. Sonoma Avenue to Hilby Avenue
3. Hilby Avenue to Fremont Boulevard
4. Fremont Boulevard to State Route 68

Figure E -1 Study Area Map

CANYON DEL REY BOULEVARD (State Route 218) CORRIDOR STUDY

Study Area Conditions

The study conducted a comprehensive review of existing land uses, key destinations, roadway characteristics, traffic collisions, transit service, and related planning efforts.

Public Input

The public outreach process included a walking corridor survey, a community meeting, online survey, city council presentations, and a presentation to the TAMC Bike and Pedestrian Committee. The feedback received expressed concern regarding traffic congestion and safety, balancing the need for safer pedestrian and bicycle access, vehicle operations, and suggested modifications to proposed improvement concepts. Input from the early phases was considered as concepts were developed and comments on the initial concepts were used to update the analysis alternatives.

Recommended Improvement Concepts

After reviewing the data, conducting a traffic operations analysis, and considering public input, the project team developed the following list of conceptual improvements to enhance safety and mobility for pedestrians, bicycles, and transit users, while facilitating traffic operations for motorists.

- Install a "Protected Intersection" at Del Monte Boulevard.
- Install roundabouts at Harcourt Avenue, Rosita Road, Carlton Drive, Via Verde, and State Route 68.
- Install Class IV protected bicycle lanes from Sonoma Avenue to Fremont Boulevard.
- Install pedestrian and bicycle refuge islands .
- Install Class II bicycle lanes from Route 1 to Del Monte Boulevard and from Pheasant Ridge Road to State Route 68.

These recommended improvement concepts were evaluated in light of roadway and traffic operations in three-time frames: Existing (2018), Short-Term (2023), and Mid-Term (2028) Conditions. Evaluations included a review of levels of service (LOS), queuing, corridor speed, travel times, and air emissions. The forecasted traffic growth will result in an increase in delay at several intersections along the corridor, causing some to operate below acceptable levels of service, particularly in the mid-term. If the recommended improvements are constructed throughout the corridor, intersection delay will be reduced from existing conditions. Detailed analysis results can be found in **Appendix A**.

Del Monte Ave/SR 218 Protected Intersection Concept

Implementation

This study also evaluates funding opportunities, preliminary cost estimates, environmental considerations, and the option of Caltrans relinquishing the right-of-way of SR 218 to the cities of Del Rey Oaks and Seaside.

The preliminary cost estimate for the Short-Term improvements is $2.4 million dollars and $85.4 million dollars for Mid-Term improvements. Due to the disturbed nature of the corridor, anticipated environmental impacts are primarily related to the construction activity.

2. STUDY AREA CONDITIONS

This chapter summarizes observations and key findings from a review of relevant documents and data pertaining to the existing conditions of the State Route 218 corridor. The findings from this chapter inform study area conditions, excluding public input which is described in the following chapter.

Setting

State Route 218, locally known as Canyon Del Rey Boulevard, runs from State Route 1 in the west to State Route 68 in the east. The 2.85 mile study corridor traverses the cities of Seaside and Del Rey Oaks and provides a major west-east route for the area. SR 218 also provides connections to the area's major north-south routes: State Route 1, Del Monte Boulevard, Fremont Boulevard, and General Jim Moore Boulevard. On the regional level, State Route 218 provides access between the communities of Seaside and Del Rey Oaks to Salinas and US-101 via State Route 68.

The Seaside section of the corridor has flat terrain and an urban/suburban context. The Del Rey Oaks section of the corridor has hilly terrain and a less urban context with limited local driveway access.

Land Uses

A variety of land uses are being served along the study corridor. Segments 1, 2, and 3, from State Route 1 to just east of Fremont Boulevard, are within the City of Seaside and can be characterized by an urban setting with a mix of commercial, open space/ recreational, public space, and residential land uses. Roberts Lake Park and Laguna Grande Regional Park are major public open spaces in the City of Seaside. The fourth segment from just east of Fremont Boulevard to State Route 68 has a less urbanized setting and is primarily abutted by residential land uses with some commercial land use located at the intersection of State Route 218 and State Route 68. The residential uses along this segment do not have driveway access to State Route 218. Local connecting streets provide access. Del Rey Park and Work Memorial Park are located south of SR 218 in Del Rey Oaks and direct access to Frog Pond Wetland Preserve, a public open space, is provided.

Figure 2.1 and **Figure 2.2** show the land uses adjacent to the State Route 218 corridor.

Figure 2.1 - City of Seaside Existing Land Uses

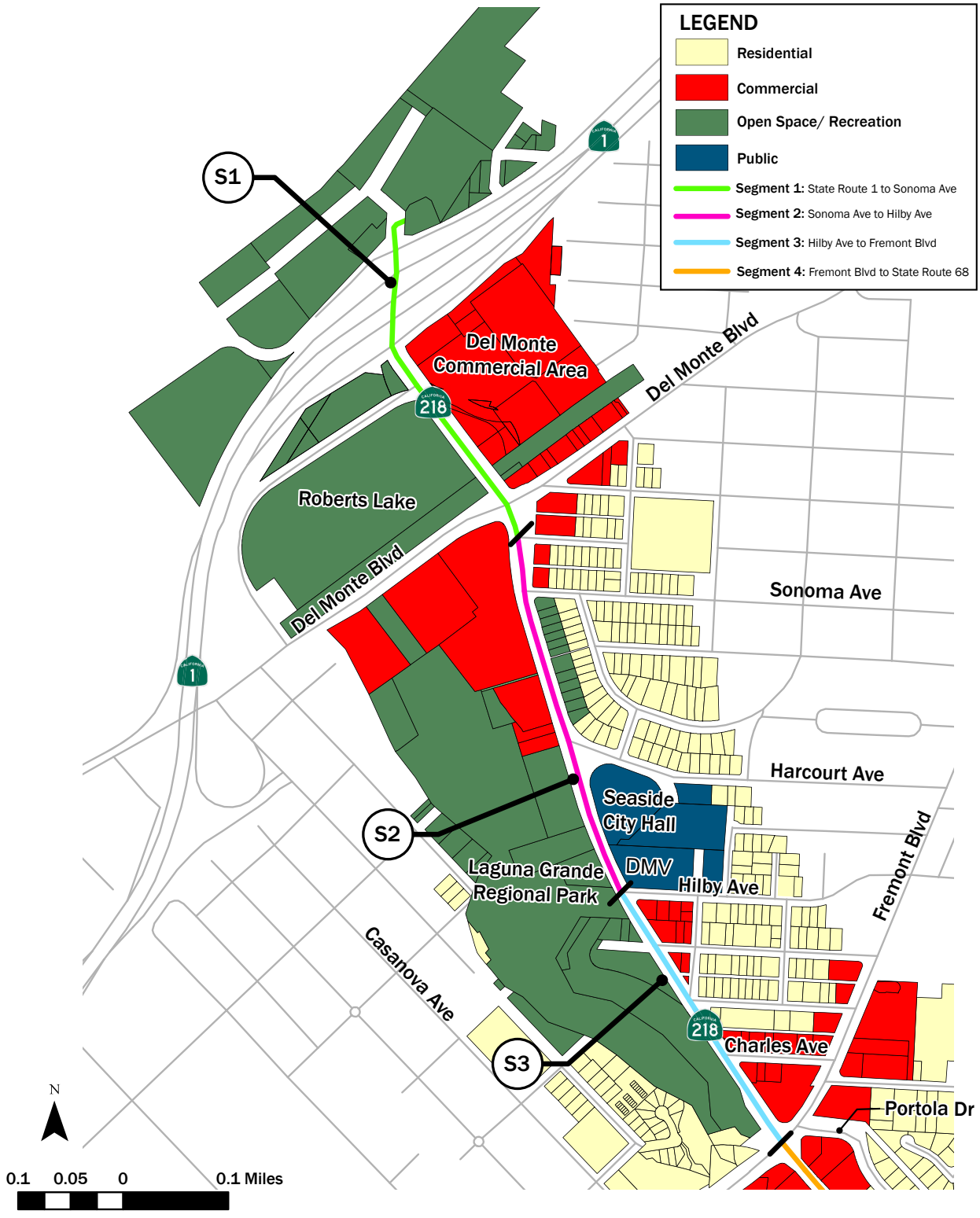
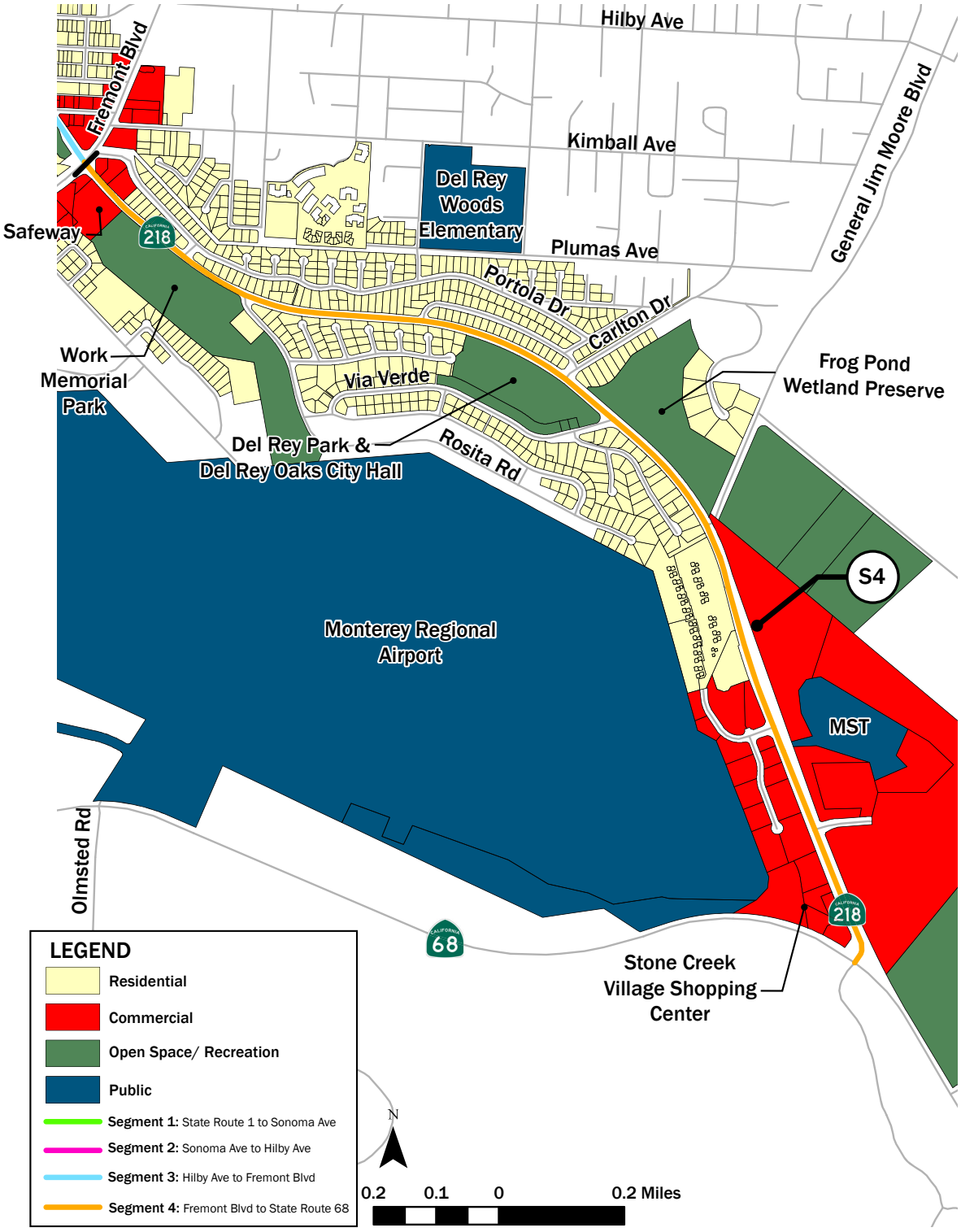


Figure 2.2 - City of Del Rey Oaks Existing Land Uses



2.1. Key Destinations

State Route 218 is one of the major corridors that provide connection from the Salinas Valley to the Monterey Peninsula. SR 218 also provides connections to major arterials Fremont Boulevard/North Fremont Street and Del Monte Boulevard. Beginning from the west at the intersection with Highway 68, the main destinations are:

- **Monterey Peninsula Recreational Trail** – an 18 mile recreation trail that runs from Pacific Grove to Castroville. There is access to the recreational trail at the intersection at Del Monte Boulevard and at the intersection with State Route 1 Southbound Ramps.
- **Del Monte Commercial Area** – a regional shopping center which provides several retail and restaurant opportunities.
- **City of Seaside City Hall** – a central gathering point for the City of Seaside. The site also houses Seaside Police Department and the Seaside Branch of the Monterey Public Library system.
- **Department of Motor Vehicles (DMV)** – the Seaside location is one of three field offices in the County and serves the Monterey Peninsula Region.
- **Laguna Grande Regional Park** – a 10-acre regional park which borders the cities of Monterey and Seaside. This park provides recreational opportunities, playgrounds, picnic and barbeque areas.
- **Safeway at Fremont** – the main grocery store for the neighboring cities of Del Rey Oaks, Seaside, and Monterey.
- **Work Memorial Park** – an open space area which borders the City of Del Rey Oaks and the Monterey Regional Airport.
- **Del Rey Park** – a local city park which features sports fields, a dog park, playgrounds, picnic and barbeque areas. Old City Hall is also located at Del Rey Park.
- **Del Rey Oaks City Hall** – a central gathering point for community meetings for the City of Del Rey Oaks.
- **Frog Pond Wetland Preserve** – in the center of Del Rey Oaks, is a 17 acre natural preserve with a small trail system. Visitors utilize the shoulder area of SR 218 to park and access the trail system.
- **Stone Creek Village Shopping Center** – a neighborhood shopping center providing retail and restaurant opportunities for residents and visitors.
- **Monterey Regional Airport** – a non-hub commercial service airport that is served by four major airlines. It serves over 400,000 passengers per year and transports approximately 1.1 million pounds of cargo. Monterey Regional Airport provides the region convenient commercial and general aviation access to the national air transportation system in support of business and leisure travel.

Key Destinations along State Route 218 in Seaside and Del Rey Oaks are shown in **Figure 2.1** and **Figure 2.2** respectively.

2.2. Traffic Volumes and Street Network

The traffic volumes along State Route 218 vary greatly from west to east, generally decreasing in the eastward direction, with a sharp increase at Fremont Boulevard. According to the Caltrans Transportation Concept Report, SR 218 has the following bi-directional daily segment volumes:

- State Route 1 to Del Monte Boulevard - 17,800
- Del Monte Boulevard to Fremont Boulevard - 14,600
- Just east of Fremont Boulevard - 11,600
- Rosita Road to Carlton Drive - 9,600
- Just west of State Route 68 - 12,100

Segment volumes are shown in **Figure 2.3** and daily Volumes were estimated using 2018 peak hour traffic counts and historical daily traffic counts and can be found in **Appendix B**.

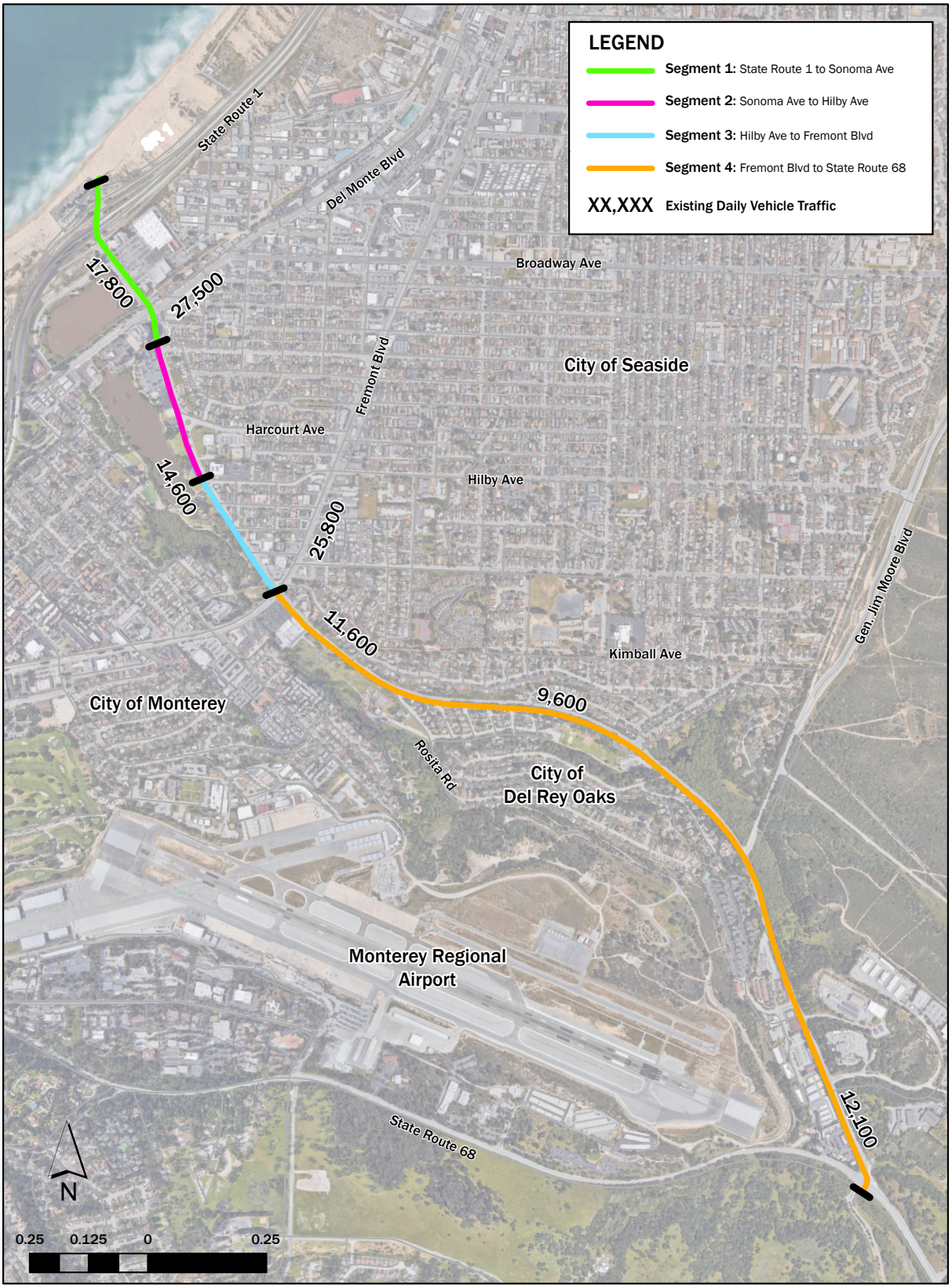
Roadways are typically designated a certain classification based on their characteristics such as speed, volume, number of lanes, etc. Typical classifications include freeways, highways, arterials, collectors, and local streets. State Route 218 is designated in the Seaside and Del Rey Oaks General Plans as an arterial. The road currently falls under the jurisdiction of Caltrans.

Study corridor local cross street classifications:

- Del Monte Boulevard – Arterial
- Sonoma Avenue – Collector
- Harcourt Avenue – Collector
- Hilby Avenue – Arterial
- Fremont Boulevard – Arterial
- Rosita Road - Local
- Canyon Street – Local
- Work Avenue – Local
- Carlton Drive – Local
- Via Verde – Local
- General Jim Moore Boulevard - Arterial
- Pheasant Ridge Road – Local
- Del Rey Gardens Drive – Local
- Ryan Ranch Road - Local

Appendix C shows the City of Seaside and City of Del Rey Oaks street network and classifications

Figure 2.3 - Volume Map



2.3. Right of Way Characteristics

State Route 218 is a Caltrans conventional highway running from State Route 1 in the west to State Route 68 in the east. The highway is 2.85 miles in length and has many different cross sections and characteristics, however, these characteristics can be grouped into four distinct segments.

The first segment runs between State Route 1 and Sonoma Avenue, crossing Del Monte Boulevard. It has four travel lanes with sidewalks on either side. There are no bicycle facilities in this segment. Major crossings or cross streets include four signalized intersections (SR 1 Southbound Ramps, Home Depot Private Driveway, Del Monte Boulevard and Sonoma Avenue) and one unsignalized, side street stop- controlled intersection at the SR 1 Northbound Ramps. A marked pedestrian crossing is not provided at the unsignalized intersection.

For the second segment, the highway transitions to a three-lane, one travel lane in each direction with a two-way left turn lane, segment from Sonoma Avenue to Hilby Avenue. This segment has intermittent sidewalks and no bicycle facilities. Major crossings or cross streets include an unsignalized, side street stop-controlled intersection at Harcourt and a signalized intersection at Hilby Avenue. A marked pedestrian crossing is not provided at the unsignalized intersection.

The third segment stretches from Hilby Avenue to just east of Fremont Boulevard and has four travel lanes. This segment has intermittent sidewalks and no bicycle facilities. Major crossings or cross streets include three unsignalized, side street stop-controlled intersections (Francis Avenue, Marin Street/Williams Avenue and Charles Avenue) and a signalized intersection at Fremont Boulevard. Marked pedestrian crossings are not provided at the unsignalized intersections.

For the fourth segment, from just east of Fremont Boulevard to State Route 68, the highway has two travel lanes with varying shoulder widths on either side. Along Stone Creek Village shopping center frontage, the highway has two eastbound travel lanes, one through lane and one right turn auxiliary lane, and two westbound travel lanes, one left turn pocket and one through lane. This segment has no continuous sidewalk, but much of the segment is signed with Class II bicycle lanes in each direction. At Stone Creek Village where the road widens, there is sufficient shoulder width for Class II bicycle lanes, although only the eastbound direction is currently signed as a bicycle lane. The westbound bicycle lane is signed from General Jim Moore Boulevard to Fremont Boulevard.

Major crossings or cross streets in segment four include eight unsignalized, side street stop-controlled intersection (Canyon Street, Rosita Road, Work Avenue, Carlton Drive, Via Verde, Pheasant Ridge Road, Del Rey Gardens Drive, and Ryan Ranch Road) and two signalized intersections (General Jim Moore Boulevard and State Route 68). Controlled pedestrian crossings are provided at the signalized intersections and marked, uncontrolled pedestrian crossings are provided at Work Avenue and Carlton Drive.

2.4. Traffic Collisions

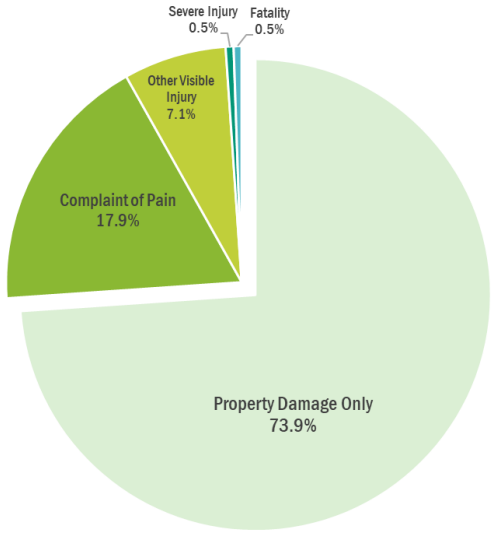
Traffic collisions along SR 218 were analyzed from 2013 to 2017 based on data from the California Highway Patrol's Statewide Traffic Records System (SWITRS). SWITRS assembles collision reports from California Highway Patrol and local police departments and allows for statistical reports to be requested through its online application. **Appendix D** shows the list of collisions by jurisdiction from the SWITRS reporting system.

A total of 184 collisions occurred between 2013 to 2017. There were 27 reported collisions in 2013, 49 reported collisions in 2014, 44 reported collisions in 2015, 31 collisions in 2016, and 33 collisions in 2017.

Collisions by Severity

In California, there are four categories used to classify collision injury severity, in addition to Property Damage Only (PDO) a non-injury category. The classification of injury severity is based on the California Highway Patrol's 2003 Collision Investigation Manual. The four levels of injury severity are listed from most severe to least: Fatal, Severe Injury, Other Visible Injury (VIS), and Complaint of Pain (COP).

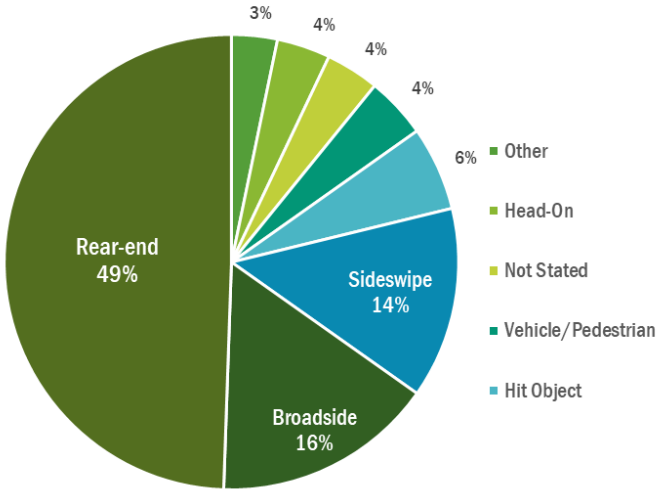
Figure 2.4 - Corridor Collisions by Severity, 2013 - 2017



*May not add to 100% due to roundoff error

The majority of collisions along State Route 218 are Property Damage Only (74%), a non-injury collision type. There were 47 injury collisions on the corridor which accounts for 26% of the total collisions. One fatality occurred on the SR 218 corridor. This was a vehicle-pedestrian collision that occurred on a weekday evening. The primary collision factor was a pedestrian violation in which the pedestrian was in the roadway. **Figure 2.4** illustrates the collision severities on the corridor from 2013-2017.

Figure 2.5 – Corridor Collisions By Type, 2013 - 2017



Collisions by Type

In California, there are eight collision types listed in the Collision Investigation Manual. The following is a list of the types of collision: head-on, sideswipe, rear-end, broadside, hit object, overturned, vehicle/pedestrian, other or not stated. The "Other" collision category includes all other collisions not previously categorized, an example of this is a collision with an animal, or a collision involving bicycles only.

The majority of collisions on State Route 218 were rear-end collisions, followed by broadside and sideswipe collisions. **Figure 2.5** illustrates the collision types on the corridor from 2013 - 2017.

Collisions by Location

In California, there are eight collision types listed in the Collision Investigation Manual: head-on, sideswipe, rear-end, broadside, hit object, overturned, vehicle/pedestrian, and other/not stated. The "Other" collision category includes all collisions not previously categorized. Examples include a collision with an animal or a collision involving bicycles only.

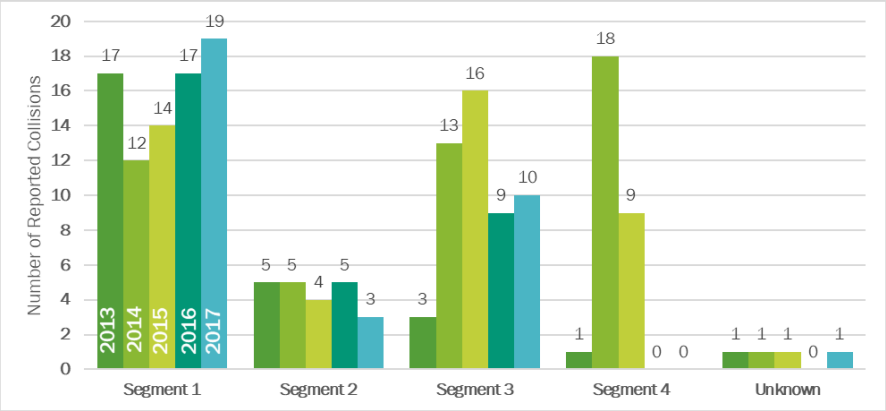
Of the four segments, Segment 1 has the highest number of collisions (43%), which also corresponds to the area with the highest corridor volumes. **Table 2.1** and **Figure 2.6** shows the corridor collisions by study segment from 2013 to 2017.

Table 2.1 Corridor Collisions by Study Segment, 2013-2017

Project Segments	2013	2014	2015	2016	2017	Average Daily Traffic Volumes (2018)	Total
Segment 1: SR 1 to Sonoma Ave	17	12	14	17	19	17,800	79
Segment 2: Sonoma Ave to Hilby Ave	5	5	4	5	3	14,586	22
Segment 3: Hilby Ave to Fremont Blvd	3	13	16	9	10	11,568	51
Segment 4: Fremont Blvd to SR 68	1	18	9	0	0	12,120	28
Unknown	1	1	1	0	1	- -	4
Total	**27**	**49**	**44**	**31**	**33**	**- -**	**184**

Source: SWITRS, 2019 and Kimley-Horn & Associates, 2019

Figure 2.6 - Corridor Collisions by Study Segment, 2013 - 2017



Bicycle and Pedestrian Collisions

Bicycle and pedestrian collisions are especially important for understanding bicycle and pedestrian safety and access along the corridor. Eighteen collisions involving bicycle and pedestrians occurred during 2013 – 2017 at the following locations:

- Intersection with Fremont Boulevard: one bicycle injury collision in 2014, two pedestrian injury collisions in 2015, one non-injury bicycle collision in 2016, and one non-injury bicycle collision in 2017.
- Intersection with Del Monte Boulevard: one pedestrian injury collision in 2013, one bicycle injury collision in 2013, one non-injury bicycle collision in 2013, one bicycle injury collision in 2014, one non-injury bicycle collision 2016, and one bicycle injury collision in 2016.
- Intersection with State Route 1: one pedestrian injury collision in 2013, one bicycle injury collision in 2015, and one bicycle injury collision 2017.
- Intersection with Charles Avenue: one pedestrian fatality in 2015.
- Intersection with Williams Avenue: one pedestrian injury collision 2017.
- Intersection with Francis Avenue: one bicycle injury collision in 2015.
- Intersection with Sonoma Avenue: one pedestrian injury collision 2017.

Figures 2.7 and **2.8** show bicycle and pedestrian collisions along the corridor by year and by severity.

Figure 2.7 - Bicycle and Pedestrian Collisions by Year, 2013 - 2017

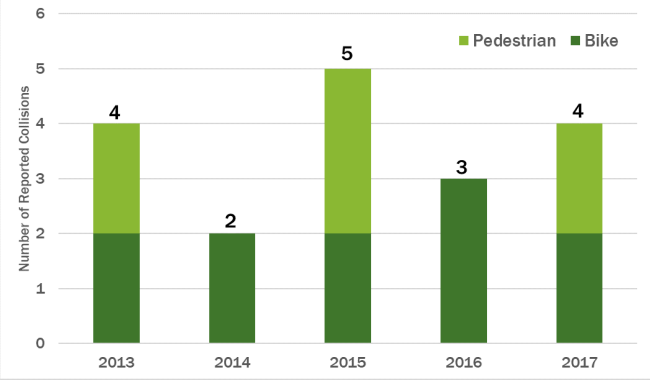
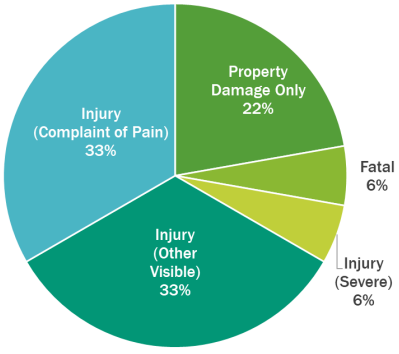


Figure 2.8 - Bicycle and Pedestrian Collisions by Severity, 2013 - 2017



2.5. Transit Service

Transit service within the State Route 218 study corridor is provided by Monterey-Salinas Transit (MST). Three routes run along the study corridor: Routes 7, 8 and the Del Rey Oaks Shuttle. Many other transit routes use the major cross streets with stops near the corridor. Crossing MST routes include 12, 20, and 67 on Del Monte Boulevard, 11, 18, 94, JAZZ A, JAZZ B and JAZZ C on Fremont Boulevard and 56 and 93 on State Route 68.

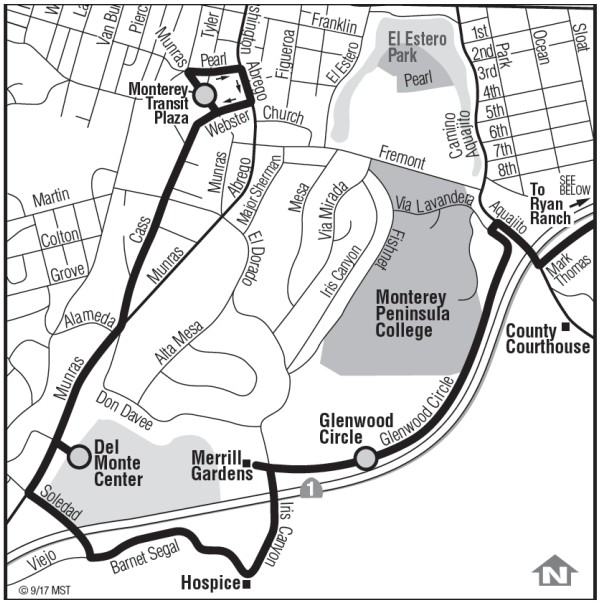
See **Figures 2.9**, **2.10** and **2.11** for the locations of routes and bus stops along State Route 218.

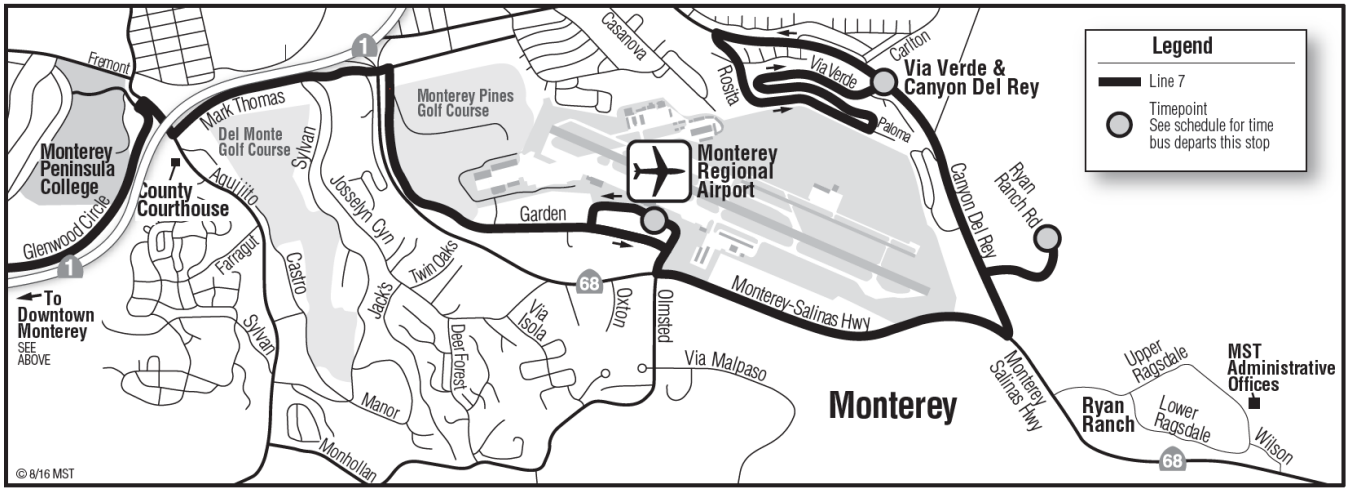
Transit provides opportunities to enhance walking and biking along the corridor to and from the bus stops. According to MST, all buses can fit two bikes on the front rack and include two spaces for wheelchairs inside.

Route 7: Del Rey Oaks – Monterey

Route 7 provides weekend service between Del Rey Oaks (outbound) and the Monterey Transit Plaza (inbound). The route travels on State Route 218 between Via Verde and State Route 68. Bus stops for the route along the corridor or directly adjacent are located at Via Verde (outbound), Pheasant Ridge Road (outbound), Del Rey Gardens Drive, Ryan Ranch Road and State Route 68 (outbound).

Figure 2.9 - Route 7 Del Rey Oaks – Monterey Route

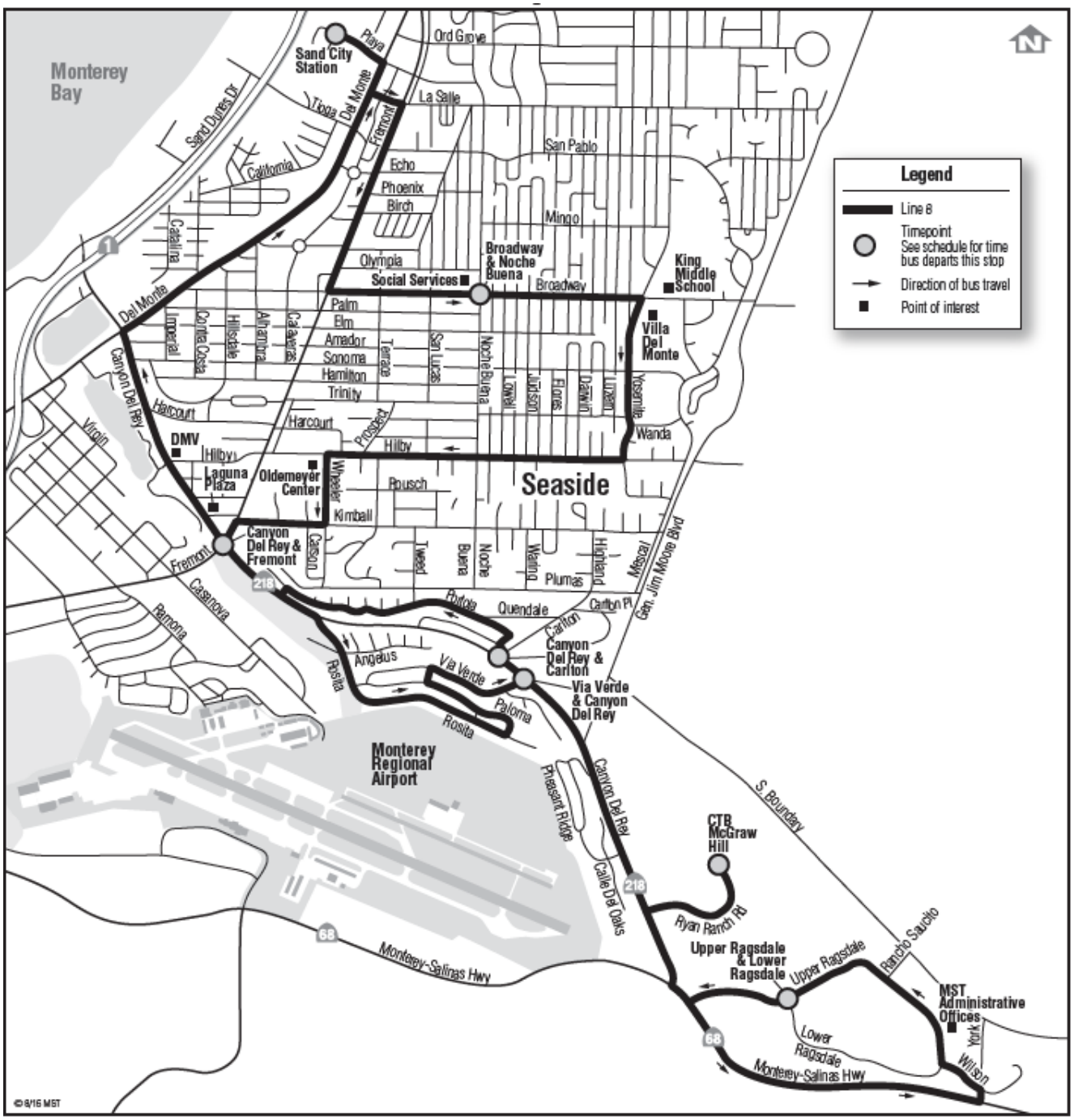




Route 8: Ryan Ranch – Sand City

Route 8 provides peak hour, weekday service between the Ryan Ranch business park (outbound), located east of the State Route 218 and 68 intersections, and the Sand City bus station (inbound). The route travels bi-directional on State Route 218 between Fremont Boulevard and Work Avenue and between Via Verde and State Route 68. Route 8 travels northbound only from Fremont Boulevard to Del Monte Boulevard. Bus stops are located at Del Monte Boulevard (outbound), Hilby Avenue (outbound), Carlton Drive (inbound), Via Verde (outbound), Pheasant Ridge Road (outbound), Del Rey Gardens Drive, Ryan Ranch Road and State Route 68 (outbound).

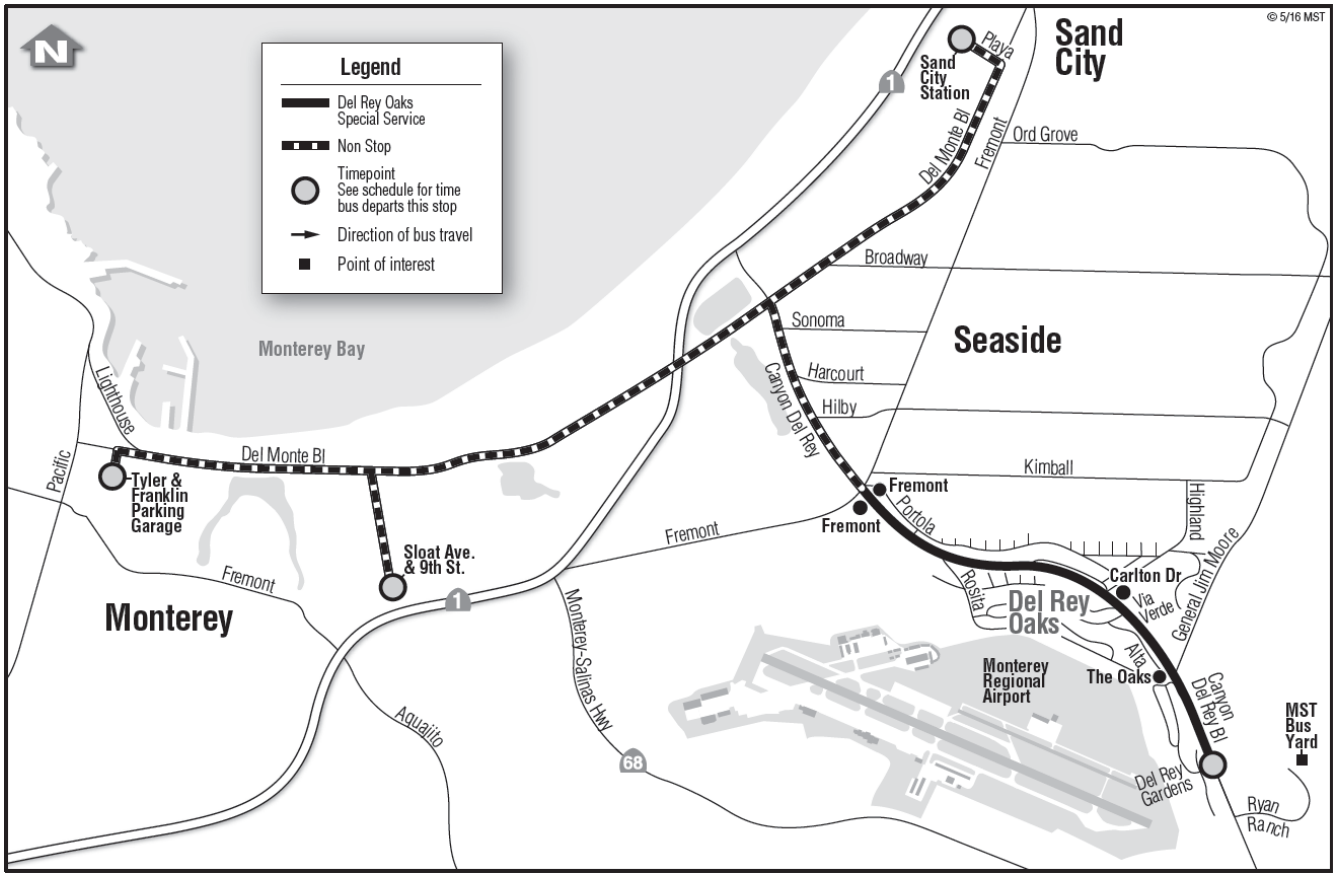
Figure 2.10 - Route 8 Ryan Ranch – Sand City Route



Del Rey Oaks Shuttle

The Del Rey Oaks Shuttle provides weekday service between Del Rey Oaks and both the Tyler and Franklin Parking Garages in Monterey and the Sand City bus station. The route begins at Del Rey Gardens Boulevard and travels along SR 218 to Del Monte Boulevard and either goes south to Monterey or north to Sand City. Bus stops in the corridor are located at Del Rey Gardens Drive, Pheasant Ridge Road, Carlton Drive, and Fremont Boulevard.

Figure 2.11 - Del Rey Oaks Shuttle Route



*In 2017, the annual ridership for the 12 bus stops along the corridor was **12,595 riders or 37 boardings per day.** The bus stops with the highest ridership are the Del Monte / SR-218 Stop and SR 218/ Hilby Stop.*

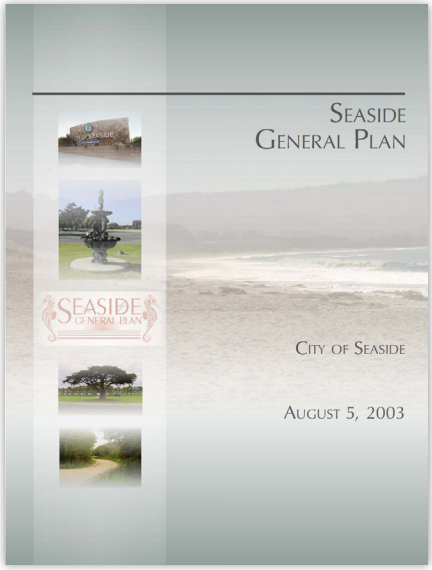
It should be noted that this ridership data was collected during the temporary suspension of the Del Rey Oaks (DRO) shuttle.

2.6. Related Planning Efforts

The State Route 218 Corridor Study utilized previous studies and planning documents to form the basis of understanding for the area. The planning documents facilitated the multimodal improvement recommendation process by indicating existing conditions and where enhancements are envisioned. Those planned improvements were incorporated into the recommendations or were enhanced based on community input or local context. The main documents used were the:

- Seaside General Plan
- Del Rey Oaks General Plan
- Caltrans State Route 218 Transportation Concept Report
- TAMC Active Transportation Plan
- Fort Ord Regional Trail and Greenway

Seaside General Plan (2004)



The City of Seaside's General Plan was last updated in 2004. The circulation element provides policy and guidance for the future of the City's transportation network. The General Plan highlights State Route 218's importance as a key component of the regional circulation system and that the future operations and land uses should match the roadway's characteristics. No specific bicycle or pedestrian improvements are stated for the study corridor area, but citywide multimodal goals and implementation plans include:

- *Goal C-3: Promote the increased use of multi-modal transportation* - Public transportation and alternative modes of travel, such as bicycling and walking, are an important component of a comprehensive circulation system. Public and alternative modes of transportation offer an alternative to the use of automobiles and help reduce air pollution and road congestion. To promote the increased use of these modes of transportation, adequate facilities must be provided and maintained.
- *Implementation Plan C-3.4.1: Bikeway Plan* - Update the existing Seaside Bikeway Plan and implement the recommended projects through the CIP.
- *Implementation Plan C-3.4.2: Pedestrian and Bicycle Facilities* - Require new development and redevelopment to provide bicycle and pedestrian facilities within the project and pedestrian connections with major destinations. Identify areas within the existing community that would benefit from improved facilities, such as Broadway Avenue, Fremont, and Del Monte. Explore additional funding sources to provide additional pedestrian facilities

Del Rey Oaks General Plan (1997)

The City of Del Rey Oaks General was last updated in 1997. The Circulation element provides policy and guidance for the future of the City's transportation network. The General Plan recognizes the importance of State Route 218 to the regional circulation system but has concerns about traffic impacting the community character of Del Rey Oaks. The following goals, policies and programs are relevant to multimodal improvements:

- *Goal C-2:* Provide or promote travel by means other than single-occupant automobile.
- *Policy C-10c:* Land use and circulation plans shall be integrated to create an environment that supports a multi-modal transportation system. Development shall be directed to areas with a confluence of transportation facilities (auto, buses, bicycles, pedestrian, etc.).
- *Policy C-11:* In order to provide or promote a safe, interconnected network of bicycle and pedestrian routes linking homes with places of work, school, recreation, shopping, transit centers, and other activity centers both within the City and nearby, four Class II City Bike Routes are hereby designated and adopted:
  - Highway 218 within City limits;
  - North/South Road [General Jim Moore Boulevard] from City limit to Highway 218 (requested Fort Ord annexation area)
  - Carlton Drive for Highway 218 to the City limit.
  - South Boundary Road (requested Fort Ord annexation area)

- *Policy C-12:* Any improvement, repavement, or signalization of the four dedicated City Bike Routes permitted by the City shall include Type II bike lanes on both sides of the affected segment of those routes.
- *Policy C-13:* New non-residential land uses which generate significant adverse traffic impacts shall dedicate an easement or make a monetary contribution, if appropriate, toward the completion of adopted bicycle routes.
- *Policy C-14:* For all proposed new land uses in the City, provision for bicycle circulation, sidewalks and pedestrian-friendly design will be required.
- *Policy C-15:* Land use and circulation plans shall be integrated to create an environment that supports a multimodal transportation system. Development shall be directed to areas with a confluence of transportation facilities (auto, bus, bicycle, pedestrian, etc.).


Transportation Concept Report
SR 218
District 5
June 2016
Caltrans

Caltrans State Route 218 Transportation Concept Report (2016)

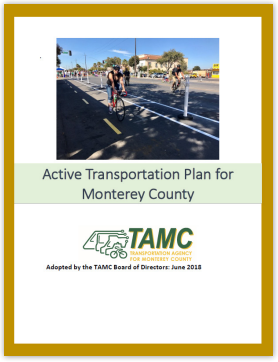
Caltrans produces transportation concept reports (TCR) to identify "trends and deficiencies within a transportation corridor, and … provides a basis for considering future actions to preserve the integrity of the corridor over the long-term. This information is valuable to Caltrans and its local and regional partners as they consider needs and priorities for future investments."

The State Route 218 TCR was last published in June 2016. Bicycles and pedestrians are allowed access along the entire corridor length, even though there are many gaps in bicycle and pedestrian facilities. Caltrans identifies several multimodal improvements for the corridor including widening the shoulder to accommodate Class II bicycle facilities and to close gaps in the pedestrian network.

TAMC Active Transportation Plan (2018)

Transportation Agency for Monterey County (TAMC) updated their 2011 Bicycle and Pedestrian Master Plan in June 2018. The vision of the updated plan is that, "Active transportation will be an integrated, convenient and safe part of daily life in Monterey County for residents and visitors of all ages and abilities."

The following goals demonstrate how to achieve this vision in Monterey County:



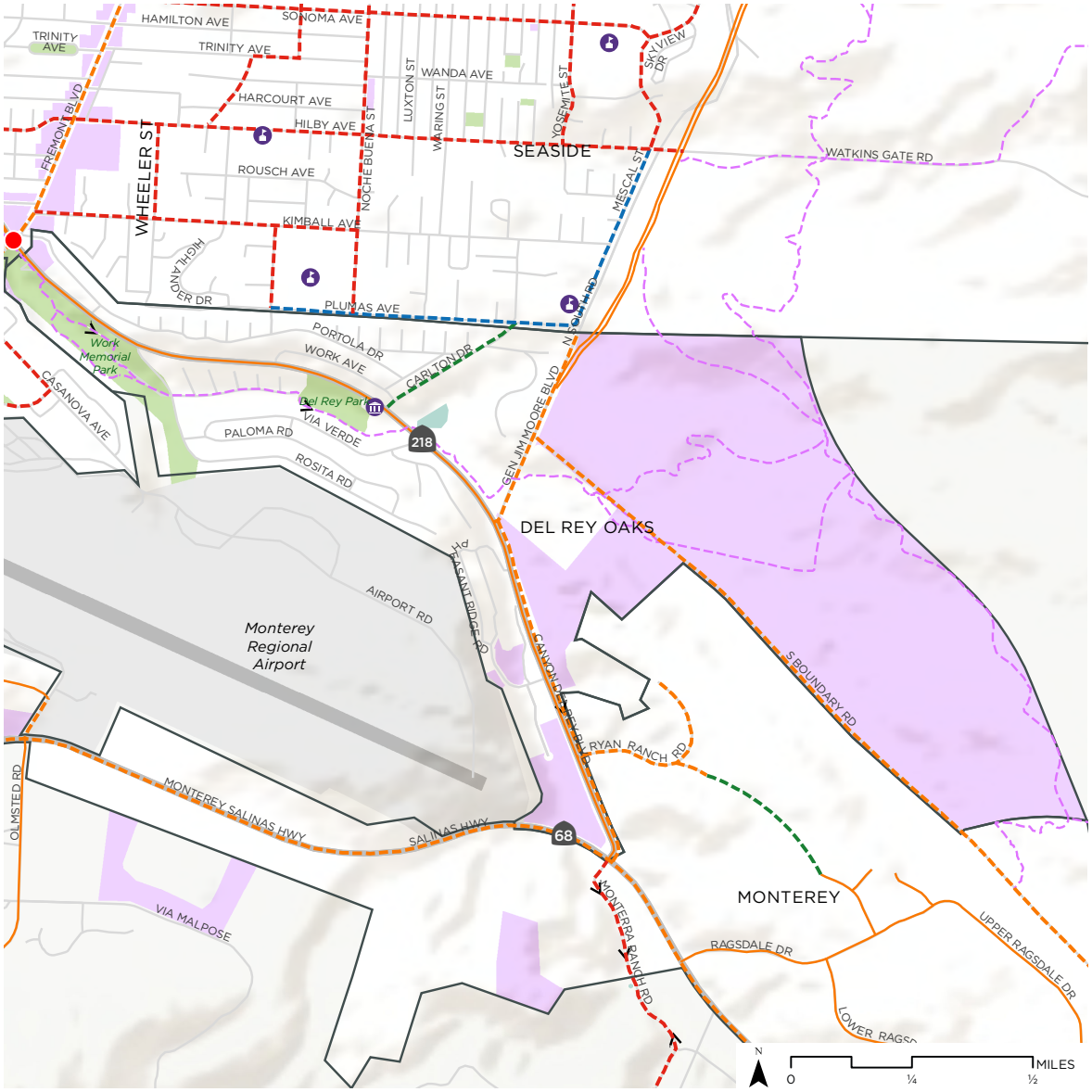
- Increase the proportion of trips accomplished by biking and walking throughout Monterey County.
- Improve bicycle and pedestrian safety.
- Remove gaps and enhance bicycle and pedestrian network connectivity.
- Provide improved bicycle and pedestrian access to diverse areas and populations in Monterey County via public engagement, program delivery and capital investment.
- Increase awareness of the environmental and public health benefits of bicycling and walking for transportation and recreation.
- Improve the quality of the bicycle and pedestrian network through innovative design and maintenance of existing facilities.

To achieve this vision, the Active Transportation Plan identifies approximately 221 miles of bicycle and pedestrian improvements to expand the county's bicycle and pedestrian network. In Del Rey Oaks, the ATP identified five proposed bicycle improvements and one pedestrian improvement. A class II bicycle path along SR 218 between General Jim Moore Boulevard and SR 68 (DRO-1) was identified as a proposed improvement and is incorporated in Chapter 5 Recommendations. The proposed pedestrian intersection (SEA-41) improvement at Fremont Boulevard would be a joint project with the City of Seaside, City of Monterey, and Caltrans.

In Seaside, the ATP identified 46 bicycle improvements and one pedestrian improvement. A class II bicycle path (SEA-22) was identified as a proposed improvement along SR 218 between Fremont Boulevard and Del Monte Boulevard and is incorporated in Chapter 5 Recommendations. The proposed pedestrian intersection (SEA-41) improvement at Fremont Boulevard would be a joint project with the City of Del Rey Oaks, City of Monterey, and Caltrans.

Figure 2.12 and **2.13** show the Monterey County Active Transportation Plan's pedestrian and bicycle facilities for the City of Del Rey Oaks and Seaside.

Figure 2.12 – Monterey County Active Transportation Plan Pedestrian and Bicycle Facilities – Del Rey Oaks



Del Rey Oaks
Monterey County Active Transportation Plan

Existing Bikeways
- Class II Bike Lane

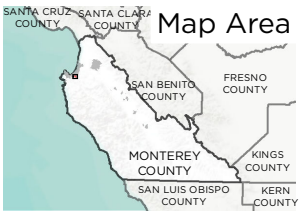
Proposed Pedestrian Improvements
- Intersection

Proposed Bikeway Improvements
- Class I Shared Use Path
- Class II Bike Lane
- Class III Bike Route
- Class IV Protected Bike Lane
- Fort Ord Rec Trail and Greenway

Points of Interest
- K-12 School
- City Hall

Land Use
- Park/Open Space
- Commercial Area
- City Boundary

>>> Uphill bikeway (Slope > 4%)

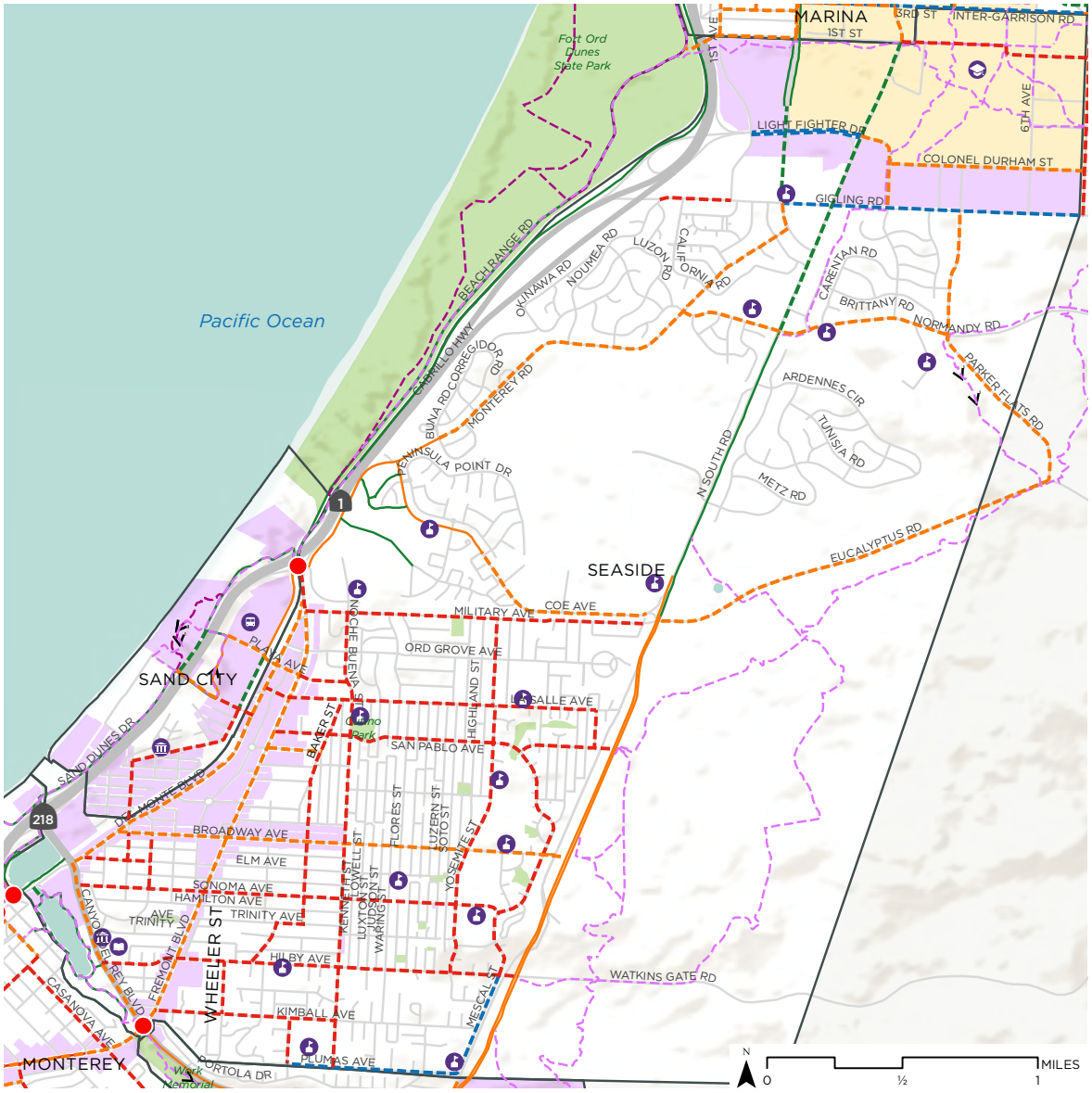


Data provided by Monterey County TAMC.
Terrain data by ESRI, NOAA.

Map produced October 2017 by Alta Planning + Design.

Source: TAMC, 2018

Figure 2.13 – Monterey County Active Transportation Plan Pedestrian and Bicycle Facilities – Seaside



Seaside and Sand City

Monterey County Active Transportation Plan

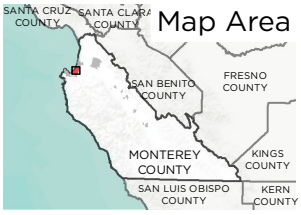
Existing Bikeways
- Class I Shared Use Path
- Class II Bike Lane
- Class III Bike Route

Proposed Pedestrian Improvements
- Intersection

Proposed Bikeway Improvements
- Class I Shared Use Path
- Class II Bike Lane
- Class III Bike Route
- Class IV Protected Bike Lane
- Fort Ord Rec Trail and Greenway
- Monterey Bay Sanctuary Scenic Trail
- >>> Uphill bikeway (Slope > 4%)

Points of Interest
- K-12 School
- College/University
- City Hall
- Transit Center
- Public Library

Land Use
- Park/Open Space
- Cal State Monterey Bay
- Commercial Area
- City Boundary



Data provided by Monterey County TAMC. Terrain data by ESRI, NOAA.

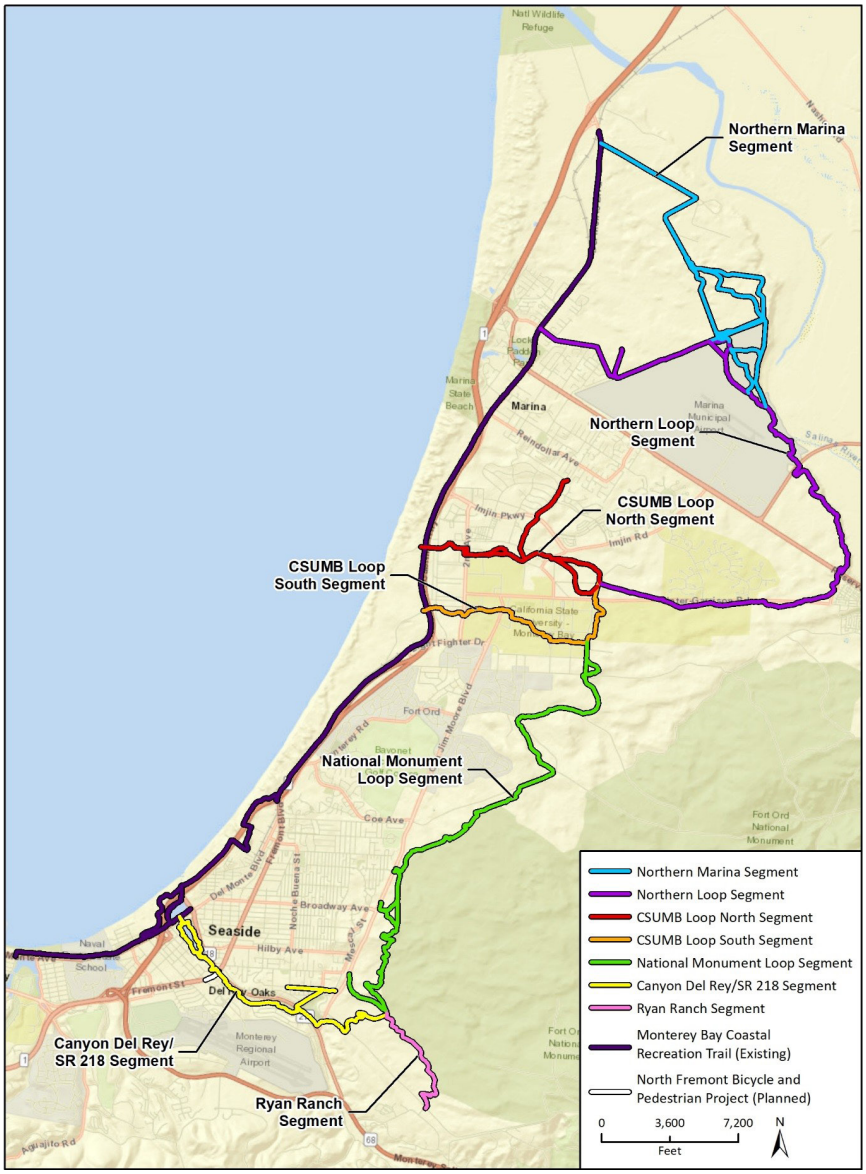
Map produced October 2017 by Alta Planning + Design.

Source: TAMC, 2018

Fort Ord Regional Trail & Greenway (FORTAG)

In Fall 2018, Transportation Agency for Monterey County (TAMC) began the environmental review and preliminary engineering of the Fort Ord Regional Trail & Greenway project. The project is a regional planning effort to connect the communities surrounding former Fort Ord. FORTAG would be a 27-mile continuous bicycle and pedestrian trail that would connect Seaside, Marina, Del Rey Oaks, Monterey, and unincorporated county areas to California State University Monterey Bay, the Fort Ord National Monument, and the Monterey Bay Sanctuary Scenic Trail.

Figure 2.14 – FORTAG Trail System



Source: TAMC, 2019

FORTAG overlaps with the Canyon Del Rey / State Route 218 corridor from just west of the intersection of General Jim Moore Boulevard to the intersection with Fremont Boulevard. The FORTAG alignment for this segment would follow the existing Frog Pond trail south and then west through the reserve crossing Canyon Del Rey Boulevard. From Canyon Del Rey / SR 218 near the Del Rey Oaks City Hall, the trail would extend northeast up Carlton Drive to Plumas Avenue. At Plumas Avenue, the trail would extend along the south side of Plumas Avenue west toward Del Rey Woods Elementary School and east to the top of Plumas Avenue near General Jim Moore Boulevard. Along Canyon Del Rey Boulevard/SR 218 the trail would also continue east along the south side of Del Rey Park, along the existing paved Angelus Way right-of-way, and then through Work Memorial Park to the Safeway

Shopping Center. Adjacent to the Safeway market, the trail would abut Canyon Del Rey Boulevard/ SR 218, crossing Fremont Boulevard within the existing intersection crosswalk. At this location FORTAG would connect with the planned North Fremont Street Bicycle and Pedestrian Project in Monterey. On the west side of Fremont Boulevard, the trail would switch back into Laguna Grande Regional Park, traversing the southwestern side of Laguna Grande in the City of Monterey, before crossing Del Monte Boulevard to connect with the Monterey Bay Coastal Recreation Trail at Roberts Lake Park. Roadway crossings on the SR 218 corridor would be provided at Carlton Drive and Fremont Boulevard.

Figure 2.14 illustrates complete proposed FORTAG Trail System, part of which connects to the State Route 218 corridor.

3. PUBLIC INPUT

The planning process included several outreach opportunities including:

- **Community Survey** – primarily gathered online, the survey ran from March 2018 – June 2018.
- **Community Meeting #1** – the first community meeting incorporated a corridor field survey/inventory followed by an opportunity for public input.
- **Community Meeting #2** – held on June 28, 2018.
- **City Councils, TAMC Bike and Pedestrian Committee, and TAMC Board presentations** – the project presented to City councils and TAMC boards and committees throughout the project process.
- By **email** or **phone**.

Publication of Events

Community meetings were publicized in several forms including updates to the project website, press releases, e-mail list serves, and postcard noticing. Prior to the first community meeting, a project website was created on the TAMC website, which was updated throughout the project timeline with meeting times and locations in addition to project documents.

TAMC issued press releases prior to community meetings to inform the community on upcoming events. Additionally, they issued invitations via the Active Transportation List Serve, which sends updates for those who have expressed interest in the TAMC bicycle and pedestrian program.

Postcards were sent to residents and business owners located within 500 feet of the State Route 218 Corridor in collaboration with the Cities of Del Rey Oaks and Seaside.

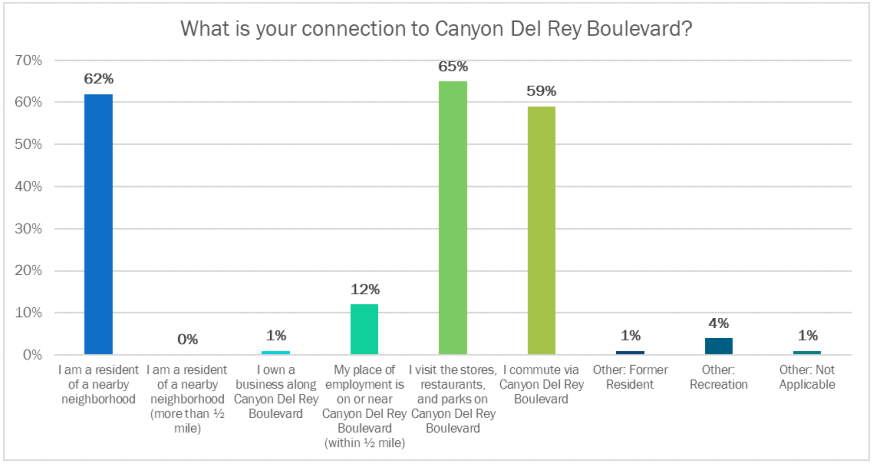
Online Survey

An online survey conducted from March to June 2018, was administered via Survey Monkey with hard copies provided to the City of Del Rey Oaks and Seaside for residents without internet access. There were 104 survey respondents, with 7 repeat respondents. The following is a summary of the survey findings. **Figures 3.1** to **3.6** illustrate the responses to survey questions. For complete results and summary, see **Appendix E**.

Connection to State Route 218/ Canyon Del Rey Boulevard

As illustrated in **Figure 3.1**, the majority of respondents are local residents and visitors utilizing the corridor for commuting purposes.

Figure 3.1 – What is your connection to Canyon Del Rey Boulevard?



Corridor Use and Frequency

Figures 3.2 and **3.3**, illustrate the corridor use by mode and frequency of use. **Figure 3.2** illustrates that the majority of respondents utilize the corridor by driving followed by walking and bicycling. Only one percent of respondents stated that they utilize transit. As shown in **Figure 3.3**, over 96% of the respondents use the corridor a few times a week or more frequently.

Figure 3.2 – How do you travel on Canyon Del Rey Boulevard? And, how often per week?

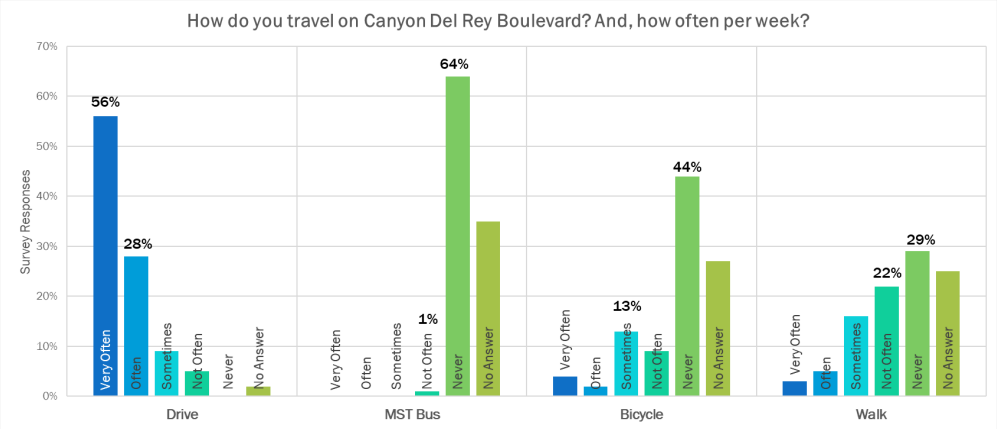
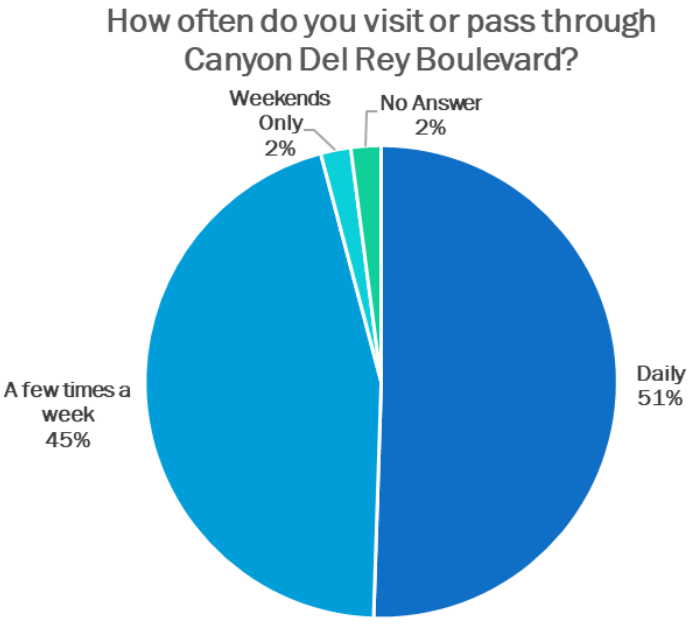


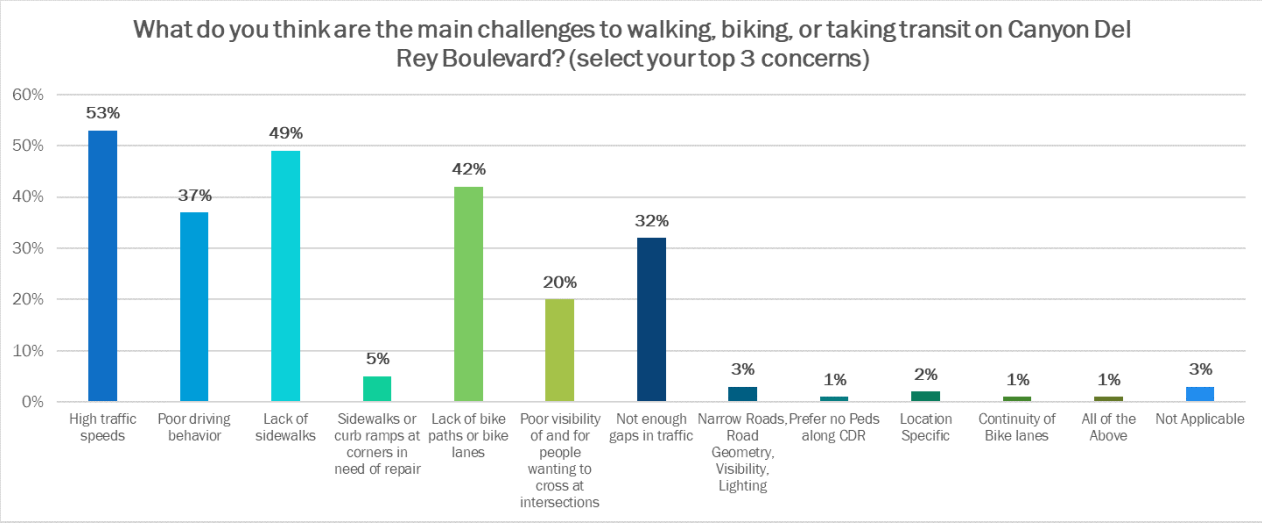
Figure 3.3 – How often do you visit or pass through Canyon Del Rey Boulevard?



Challenges and obstacles to using the Corridor

Figure 3.4 illustrates the main challenges identified by survey respondents. The top three concerns are: high traffic speeds, lack of sidewalks, and lack of bike paths or bike lanes.

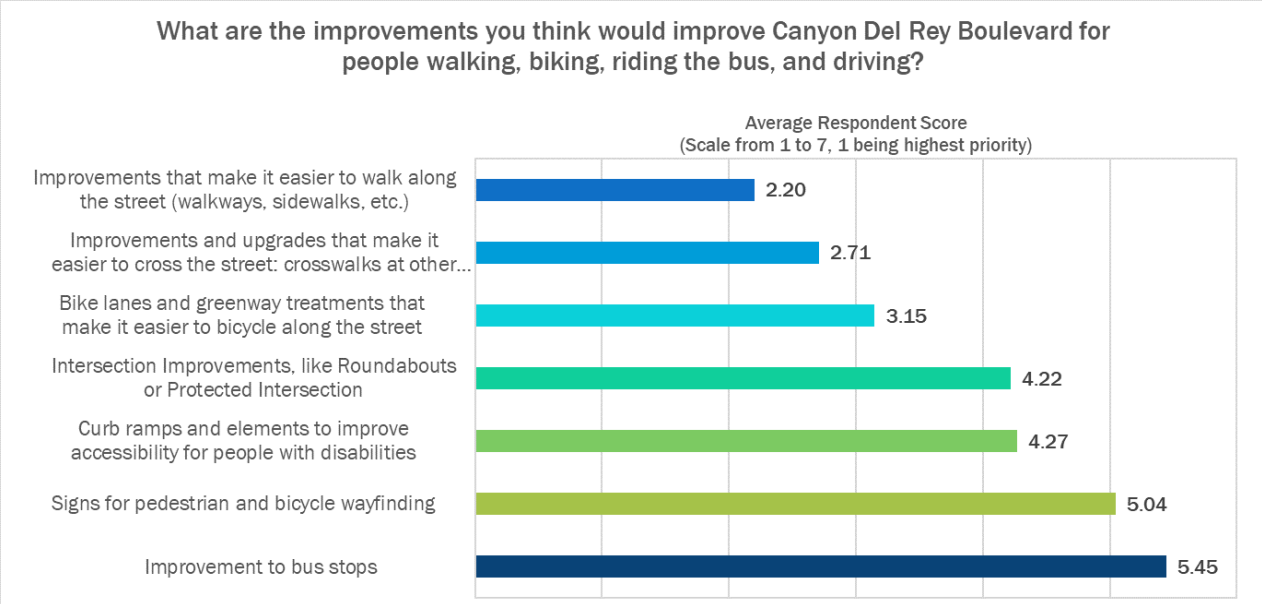
Figure 3.4 – What do you think are the main challenges to walking, biking, or taking transit on Canyon Del Rey Boulevard? (Select your top 3 concerns)



Preferred Improvements along the Corridor

When asked to prioritize improvements along the corridor, the top three priorities for respondents were pedestrian walkway improvements, pedestrian crossing improvements, and bicycle facility improvements as shown in **Figure 3.5**.

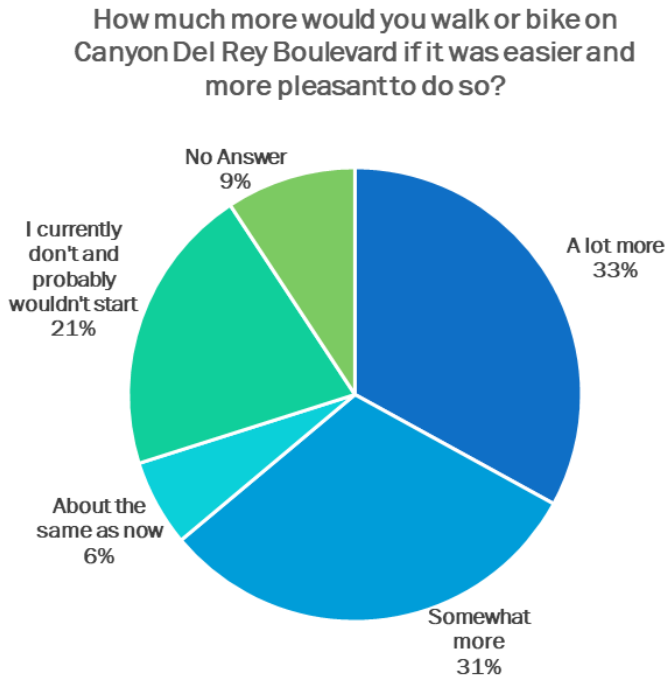
Figure 3.5 – What are the improvements you think would improve Canyon Del Rey Boulevard for people walking, biking, riding the bus, and driving?



Likelihood to using Canyon Del Rey Boulevard

As illustrated in **Figure 3.6**, when asked if Canyon Del Rey Boulevard (SR 218) was made more pleasant or convenient, more than half of the respondents indicated they would utilize Canyon Del Rey more.

Figure 3.6 – How much more would you walk or bike on Canyon Del Rey Boulevard if it was easier and pleasant to do so?

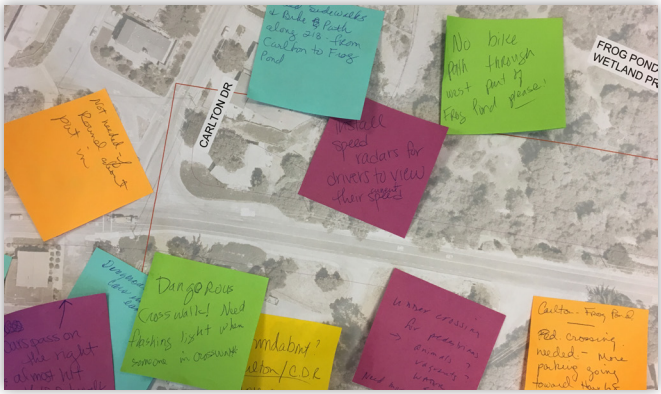


Community Meeting #1

On Saturday April 7, 2018, the Corridor Field Survey event was hosted at Seaside City Hall. Two corridor survey trips were held. These trips utilized buses making several stops along the way for attendees to disembark and survey potential improvement locations. In addition to the corridor survey trips, event attendees were given a 36-foot poster to write comments, concerns, or ideas. Attendees were also shown a "Complete Streets Toolbox" to give ideas for future improvements, as well as, preliminary concepts for some of the major intersections along the corridor. The corridor survey event was attended by approximately 20-25 people, including local residents, partner agencies, and consultants. **Figure 3.7** shows meeting activities and community feedback.

Figure 3.7 – Community Meeting #1

Community collaboration at Community Meeting #1 along Corridor Poster (Kimley-Horn, 2018)



Example of community input from Corridor Poster (Kimley-Horn, 2018)

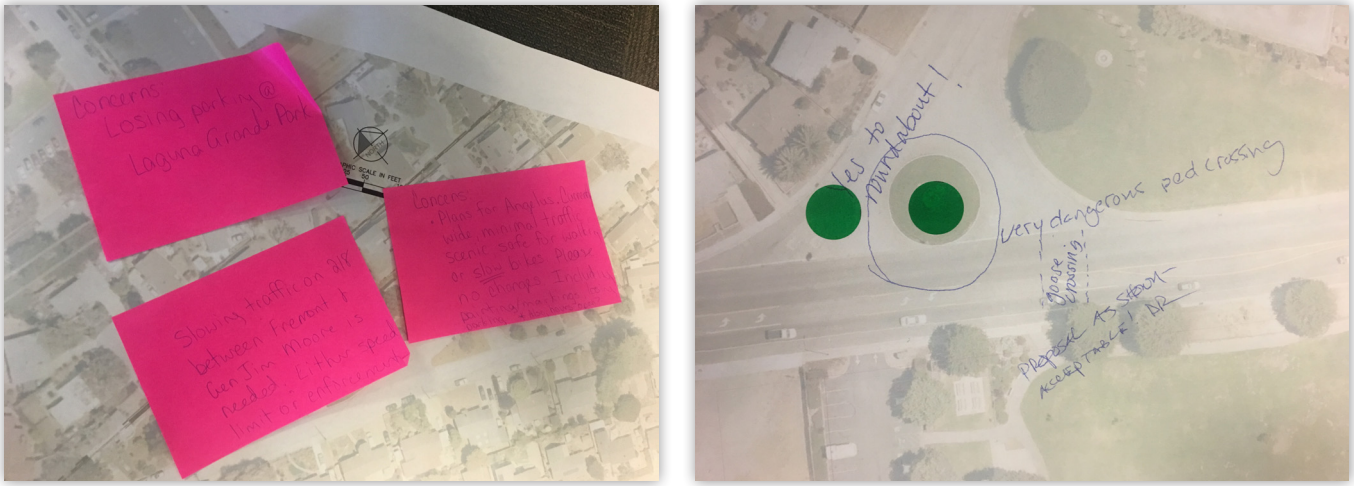
Explaining corridor survey instructions (Left)and photo taken during the corridor survey (Right). (TAMC, 2018 & Caltrans, 2018)

For complete results and summary, see **Appendix E**.

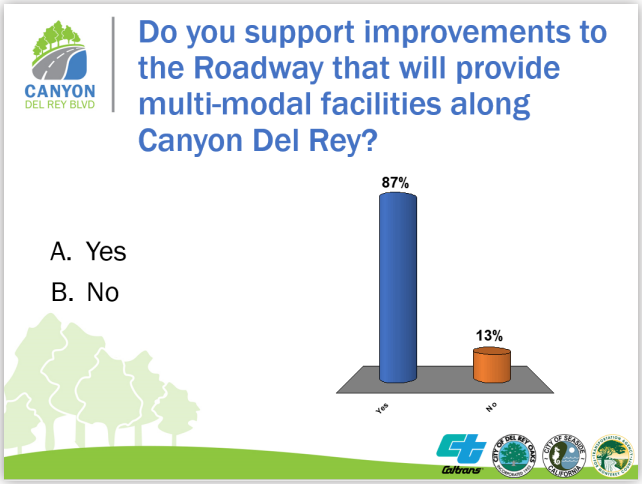
Community Meeting #2

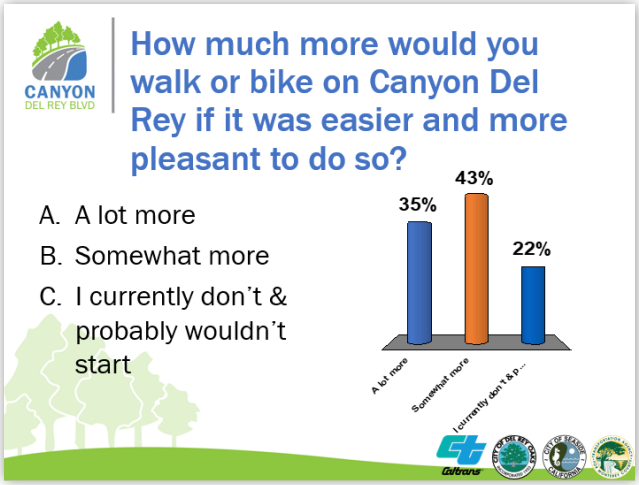
On Thursday June 28, 2018, the second community event was hosted at Oldermeyer Center in Seaside. Based on the feedback from the prior meeting, attendees were shown conceptual drawings of intersections and given the opportunity to vote on preferences and provide verbal feedback. In addition to the conceptual drawings, event attendees were given a 36-foot long poster to write comments, concerns, or ideas. Attendees were also shown a "Complete Streets Toolbox" to provide reference for what improvements could look like when completed. The corridor survey event was attended by approximately 24-30 people, including local residents, partner agencies, and consultants. **Figure 3.8** shows community feedback from Community Meeting #2.

Figure 3.8 – Community Meeting #2



Community collaboration at Community Meeting #2 (Kimley-Horn, 2018)





Polling results from the community meeting (Kimley-Horn, 2018)

For complete results and summary, see **Appendix E**.

City Council and TAMC Committee Presentations

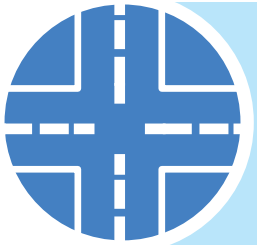
The State Route 218/ Canyon Del Rey Boulevard Corridor Study was presented to the City Councils of Del Rey Oaks, Seaside, and Monterey, as well as, the TAMC Bicycle and Pedestrian Committee and TAMC Board of Directors for review and comment.

Presentations to the City Councils occurred between April and May of 2019. The presentations to City Council were intended to gather feedback on the improvements previously identified and voted on at Community Meeting #2. Feedback on the improvements was generally positive, with questions directed on how improvements were decided and how some of the improvements would work.

In August 2019, the Final Draft of the State Route 218/Canyon Del Rey Boulevard Corridor Study was presented to the TAMC Board of Directors for approval.

3.1. Key Themes from Public Comment

This section details some of the key themes received from public comment events. A detailed list of observations is included in **Appendix E**. The following are a summary of comments and concerns along the corridor by topic:



Major Intersections

- Concerns with crossing safely
- Likes the idea of roundabouts, but concerned about roundabout education
- People run red lights, want to update signal timing

Pedestrian Access and Safety

- Especially concerned with crossings, particularly in Del Rey Oaks at Carlton Drive and near Laguna Grande Park in Seaside
- Missing sidewalks along State Route 218
- Need more pedestrian visibility
- Need flashing lights/beacons, crosswalks, stop signs and medians

Bicycle Access and Safety

- Cars pass on the right of left turning vehicles, very dangerous for bicycles
- Bike lanes in Del Rey Oaks, want more facilities in Safeway
- Intersection is important for future connections, how can it fit wider sidewalks
- People run red lights, dangerous, not safe for pedestrians

General Observations

- Speeding along the corridor
- Homeless population in the park
- Want more information on how FORTAG connects along State Route 218
- Concerns about FORTAG connection in Frog Pond
- Balance improve Pedestrian and Bicycle connections with vehicle.

4. RECOMMENDATIONS

4.1. Chapter Overview

The key objective of the State Route 128 Corridor Plan was to identify needs, gaps, opportunities, and community values to help inform decision makers on what type of conceptual improvements could enhance mobility for pedestrians and bicyclists by creating a complete street environment, thereby making the corridor a more attractive community transportation resource. The existing corridor provides limited access for all modes, but enhancing multi-modal features is desirable for movement along the corridor.

Based on input from the community and field observations, several main goals were identified.

- Fill in gaps in the existing sidewalk network.
- Add bicycle facilities from State Route 1 to Fremont Boulevard.
- Provide multi-use connection to the Monterey Peninsula Recreational Trail.
- Add pedestrian facilities from Fremont Boulevard to State Route 68.
- Provide future pedestrian and bicycle connection to FORTAG (Fort Ord Regional Trail and Greenway).
- Add westbound bicycle facilities from State Route 68 to General Jim Moore Boulevard.

Other improvements that were reviewed for feasibility were road diets and alternative intersection controls, such as roundabouts. A road diet results in reducing the number of surplus travel lanes and reallocating the space for transit, pedestrian, and bicycle improvements.

4.2. Conceptual Designs

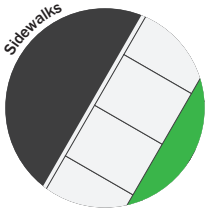
Identified improvements were split into two categories: short-term (3 to 5 year implementation), and mid-term (5 to 10 year implementation.) The entire study corridor, from State Route 1 to State Route 68, was identified for improvements and corridor layouts were created. The corridor layouts show planning level multimodal improvements overlaid on aerial imagery. Approximate right-of-way information is displayed from the County of Monterey geographical information system public database. The aerials and parcel data are not construction document accurate and the layouts represent planning level information only. All conceptual layouts will have further engineering study and be implemented where feasible. The layouts can be seen in **Appendices F** and **G**.

Recommended Improvement Categories

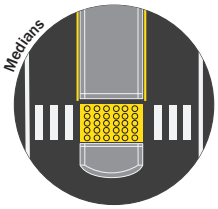
Table 4.1 lists recommendation improvement categories that were incorporated into the Canyon Del Rey Boulevard/ State Route 218 Corridor Study. These icons will be shown next to more detail descriptions on the type of improvement and extent of the improvement on the corridor.

Table 4.1 Recommended Improvement Categories

Pedestrian Improvements



Sidewalks: This icon represents any sidewalk improvement or ADA improvement to intersections

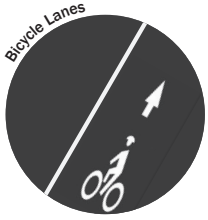


Medians: This icon represents any median improvements recommended for the roadway Medians are also used to improve bicycle conditions as well.

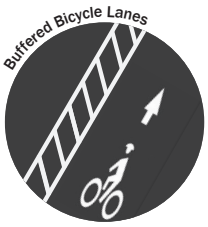
Pedestrian Crossings: This icon represents any improvement or addition of a pedestrian crossing.

Bicycle Improvements

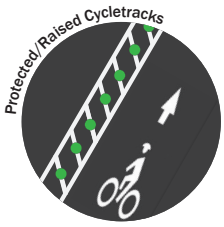
Multi Use: This icon represents any improvement or addition of a multi-use path, a shared pedestrian and bicycle facility (Class I bicycle facility).



Bicycle lanes: This icon represents any improvement or addition of bicycle lanes (Class II bicycle facility). This symbol is also used for any improvements or striping at intersections to complement the continuation of bicycle lanes.

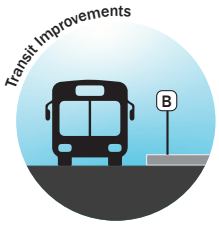


Buffered Bicycle lanes: This icon represents any improvement or addition of buffered bicycle lanes (Class II bicycle facility). This symbol is also used for any improvements or striping at intersections to complement the continuation of bicycle lanes.



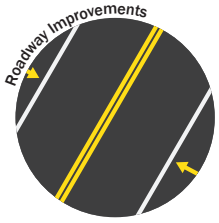
Protected/ Raised Cycletracks: This icon represents any improvement or addition of protected or raised cycle tracks (Class IV bicycle facility). This symbol is also used for any intersection improvements or striping at intersections to complement the continuation of cycletracks.

Transit Improvements

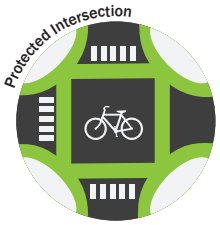


Transit Improvements: This icon represents any improvement or addition to transit access including bus stops and other transit amenities.

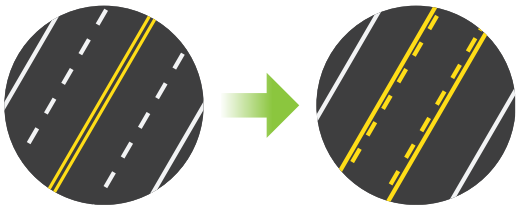
Roadway and Intersection Improvements



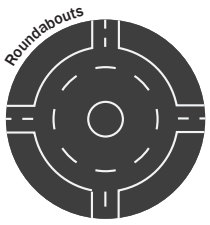
Roadway Improvements: This icon represents any improvement or addition to roadway such as lane narrowing or changes to intersection geometry.



Protected Intersections: This icon represents the recommendation to implement a protected intersection.



Roadway Improvements: This icon represents the recommendation to implement a road diet, which is the conversion from a four-lane road to a two-lane road with a two-way left turn lane.



Roundabouts: This icon represents the recommendation to implement a roundabout.

Short-Term Improvements

Corridor improvements were identified for both short and mid-term implementation. Since the scope of what is feasible for quick implementation hinges on many factors, such as right-of-way and funding availability, assumptions were made about what improvements constitute as “short-term”. For the purposes of the study, short-term improvements consist mainly of striping changes and minor pedestrian and signal improvements. The identified improvements are described below and the layouts can be seen in **Appendix F**.

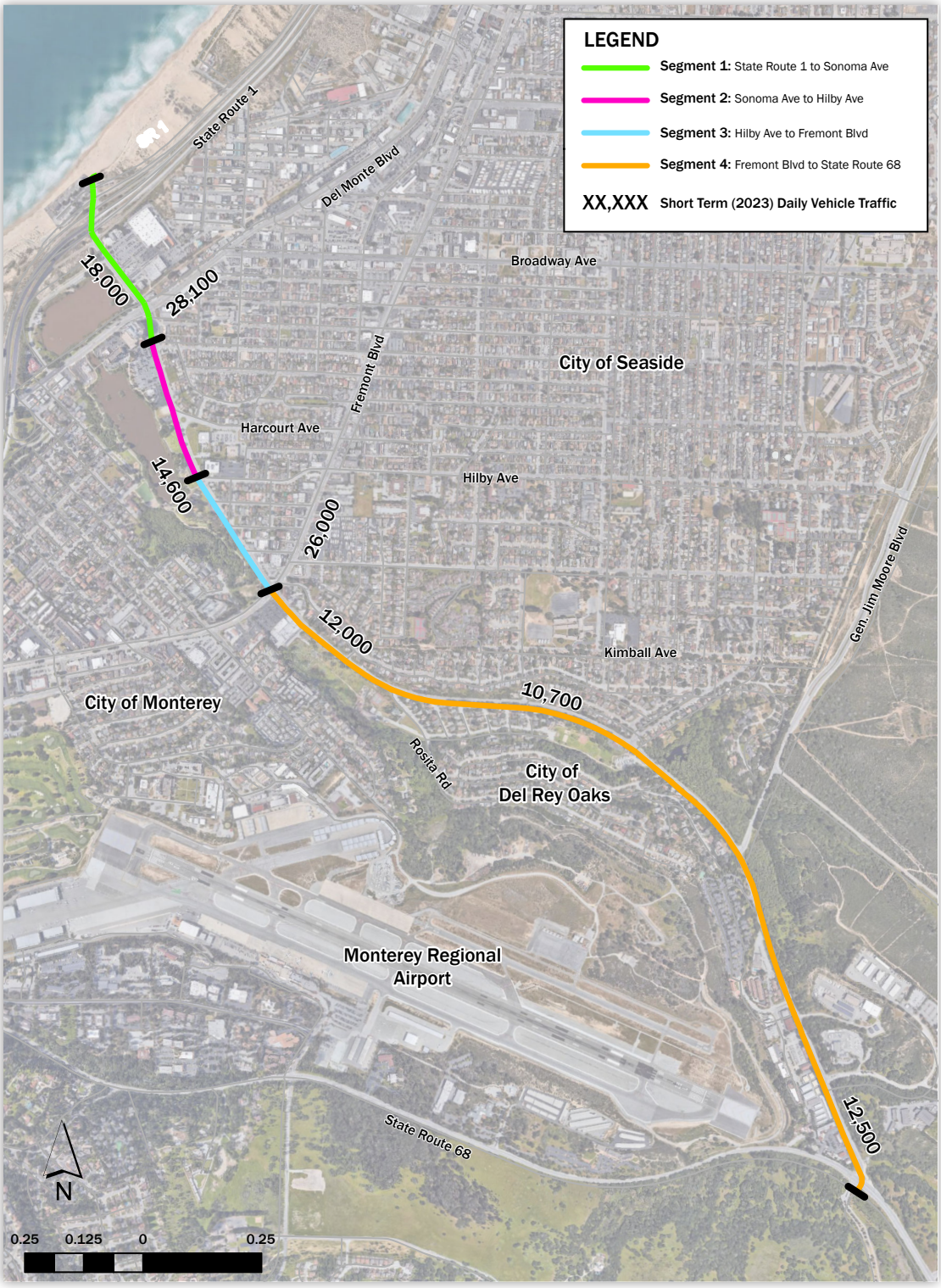
Transportation System Operations

Short-term improvements are estimated to be complete by 2023. A Short-Term (2023) Conditions Scenario was established by forecasting five years of growth from 2018 volumes. The intersection peak hour factor, heavy vehicle, pedestrian volumes and bicycle volumes were assumed to be the same as existing conditions. Study intersections were analyzed with existing condition lane geometry and traffic control to simulate traffic growth with no network improvements for the Short-Term (2023) Conditions. Proposed short-term improvements are primarily striping or sidewalk which would not affect the Highway Capacity Analysis. Three intersections operate at less than acceptable levels. All of these are side street, stop-controlled intersections along SR 218 and are operating at LOS D or below due to limited gap opportunities for stopped vehicles to access SR 218.

Figure 4.1 illustrates the estimated daily volumes for Short-Term (2023) Conditions.

For more detailed traffic operations analysis, see **Appendix A**.

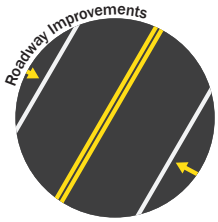
Figure 4.1 – Short-Term (2023) Conditions Daily Volumes



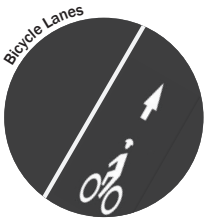
Segment 1: State Route 1 to Sonoma Avenue

This segment has existing sidewalk but has no on-street bicycle facilities. A spur of the Monterey Peninsula Recreational Trail connects the main trail to Roberts Lake Park and runs along the south side of State Route 218 under State Route 1.

Segment 1 Recommendations



- Narrow the travel lanes to 11 feet.



- Add green bicycle striping at intersections.
- Stripe a westbound bicycle lane (Class II) under SR 1.

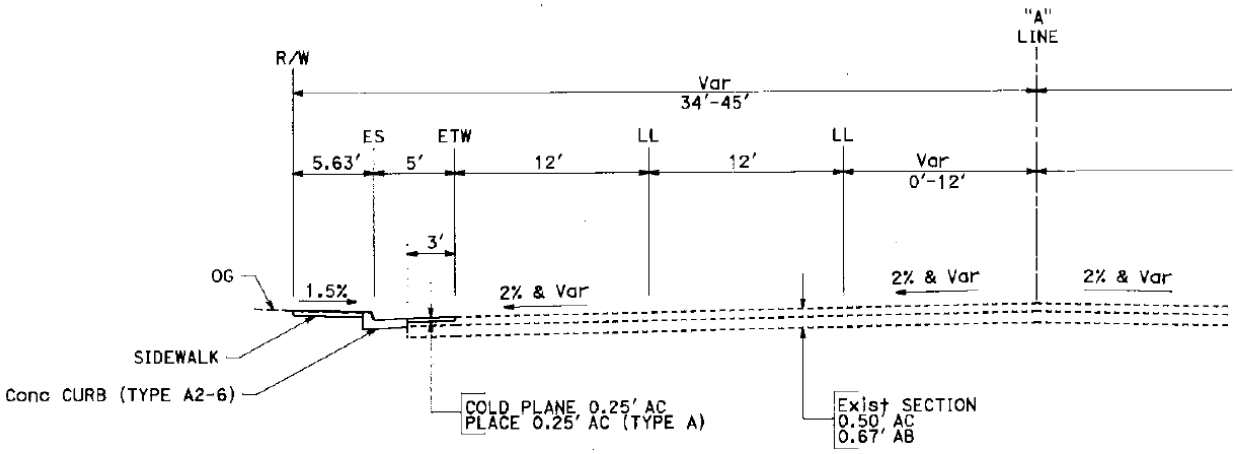
- Stripe buffered bike lanes in the eastbound and westbound direction from SR 1 to Del Monte Blvd.

For further detail see Appendix F, Short-Term Proposed Layouts.

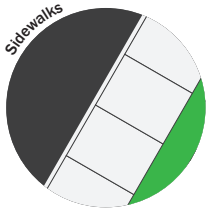
Segment 2: Sonoma Avenue to Hilby Avenue

This segment has intermittent sidewalk, but no bicycle facilities. Sidewalk gaps on the north side of SR 218 are planned to be improved in a concurrent Caltrans ADA project from Del Monte Boulevard to Fremont Boulevard. **Figure 4.2** shows the proposed cross section of improvements. No bicycle improvements are recommended in the short-term because narrowing the travel lanes alone does not provide a continuous, sufficient width for a striped bicycle lane. A road diet is considered for this segment in the mid-term improvements that would provide sufficient space for a bicycle facility.

Figure 4.2 – Planned Caltrans ADA Project Cross Section



Segment 2 Recommendations:

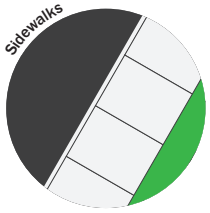


- ADA improvements and sidewalk extension, per the Caltrans planned improvement project.

Segment 3: Hilby Avenue to Fremont Boulevard

This segment has intermittent sidewalk but no bicycle facilities. Sidewalk gaps on the north side of State Route 218 are planned to be improved in a concurrent Caltrans ADA project from Del Monte Boulevard to Fremont Boulevard. No bicycle improvements are recommended in the short-term because narrowing the travel lanes alone does not provide a continuous sufficient width for a striped bicycle lane. A road diet is considered for this segment in the mid-term improvements that would provide sufficient space for a bicycle facility.

Segment 3 Recommendations:



- ADA improvements and sidewalk extension, per the Caltrans planned improvement project.

Segment 4: Fremont Boulevard to State Route 68

This segment has very little existing sidewalk, mostly near Fremont Boulevard, but has bicycle lanes in the shoulder for a majority of the segment. The main short-term improvements involve striping changes to increase the bicycle lane width. **Figure 4.3** shows the recommended typical section for this segment and **Figure 4.4** shows the constrained cross section at the Arroyo Del Rey creek crossing, where there is insufficient space for a westbound bicycle lane.

Figure 4.3 – Segment 4 Short-Term Typical Section (Looking West)

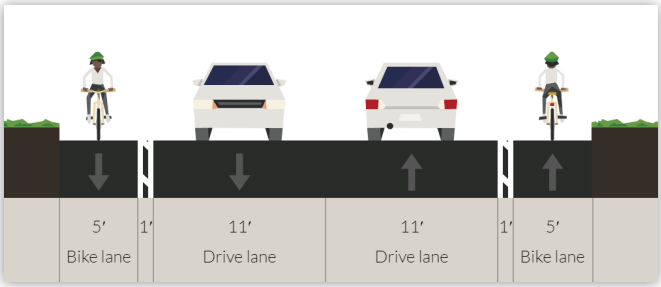
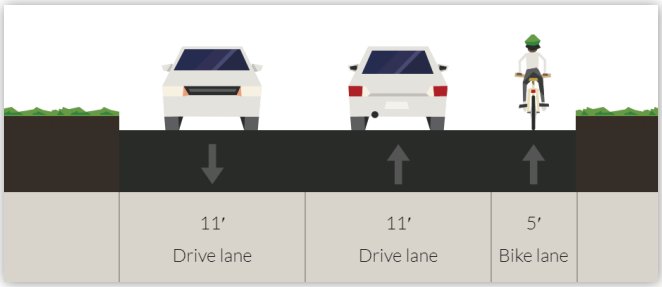
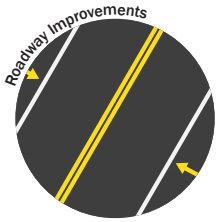


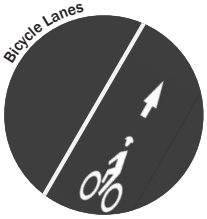
Figure 4.4 – Segment 4 Short-Term Constrained Section



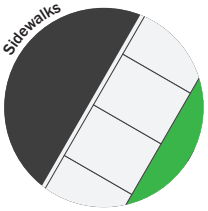
Segment 4 Recommendations



- Narrow the travel lanes to 11 feet.
- Remove the eastbound right turn pocket at Pheasant Ridge Rd and Del Rey Gardens Dr (to accommodate bicycle lane).
- Remove right turn pavement marking arrows at Stone Creek Village shopping center driveways.

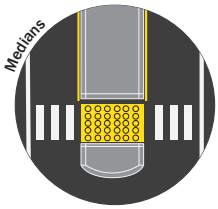


- Add green bicycle striping at intersections.
- Stripe a new bicycle lane westbound from Pheasant Ridge Rd through Gen. Jim Moore Blvd.
- Sign and stripe eastbound shoulder as a bicycle lane from Pheasant Ridge Rd to SR 68.
- Sign and stripe westbound shoulder as a bicycle lane from SR 68 to Del Rey Gardens Dr.

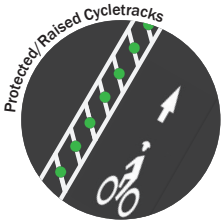


- Connect the existing asphalt path from east of Safeway to Rosita Rd with a raised sidewalk.

- Stripe the bicycle lanes with two solid white stripes to create a narrow-painted buffer.



- Construct a raised median opposite of Canyon St to divide the eastbound travel lane with the bicycle lane.



- Install flexible delineator posts opposite of Rosita Rd, Work Ave, Via Verde and Carlton Rd to divide the travel lane with the bicycle lane.

- Stripe uncontrolled crosswalk at Work Ave perpendicular across State Route 218 to shorten crossing time.

For further detail see **Appendix F**, *Short-Term Proposed Layouts.*

Mid-Term Improvements

Recommended mid-term improvements encompass all multimodal improvements that were not included in the short-term recommendations. Improvements include a desire to add pedestrian facilities, sidewalks or multiuse paths, throughout the entire corridor, creating a continuous walking connection that would provide enhanced access between residential, commercial, and recreational areas. For bicycle facilities, the recommendations include separated bikeways, either multiuse paths (Class I) or cycletracks (Class IV), for much of the study corridor. The separated bikeways will provide more space and enhance the comfort level for cyclists as compared to the existing conditions.

The core improvement recommendation is the implementation of a road diet on SR 218 from Sonoma Avenue to Fremont Boulevard. Converting this segment from four lanes to three lanes will allow the implementation of pedestrian and bicycle facilities that do not currently exist. This space reallocation will greatly improve the multimodal character of the corridor.

Other recommendations include the implementation of roundabouts at intersections with minor streets that are currently only side-street stop-controlled. The addition of the roundabouts will make it easier for vehicles to turn left from the minor street onto State Route 218 and will act as a traffic calming measure, slowing vehicles and allowing additional bicycle and pedestrian crossings.

The identified improvements are described below and the full corridor conceptual layouts can be seen in **Appendix G**.

Transportation System Operations

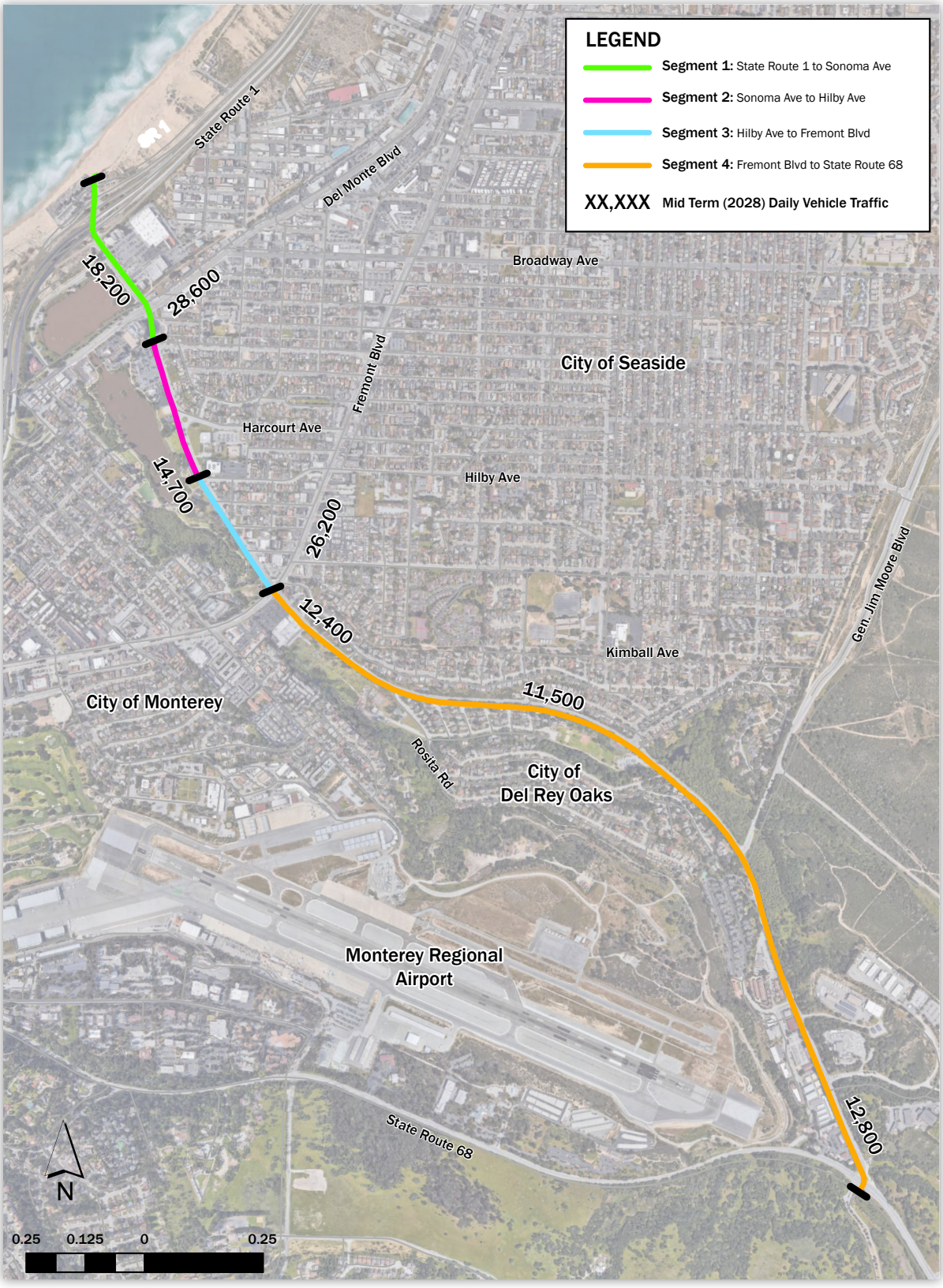
Mid-term improvements are estimated to be complete by 2028. A medium-Term (2028) Conditions Scenario was established by forecasting ten years of growth from 2018 volumes. The intersection peak hour factor, heavy vehicle, pedestrian volumes and bicycle volumes were assumed to be the same as existing conditions. Studies were analyzed with existing condition lane geometry and traffic control to simulate traffic growth with no network improvements for the Mid-Term (2028) Conditions. Proposed short-term improvements that may be in place for Mid-Term Conditions, are primarily striping or sidewalk which would not affect the Highway Capacity analysis. Five intersections operate at less than acceptable levels. Three of these are side street stop-controlled intersections along SR 218 and are operating at LOS D or below due to limited gap opportunities for stopped vehicles to access SR 218. The remaining two intersections that operate at less than acceptable levels are the signalized intersection of Del Monte Boulevard and Fremont Boulevard, which are considered principal arterials and carry significant amounts of regional traffic.

Several proposed improvements such as the addition of sidewalks or implementation of the Del Monte Boulevard Protected Intersection would impact Highway Capacity Manual (HCM) Level of Service analysis and cannot be fully reflected in Synchro or SimTraffic modeling. Additionally, the primary purpose of some improvements is for the integration of bicycle and pedestrian access and safety for all modes.

Caltrans is concerned about the congestion created on SR 218 relative to the road diet proposed on Segment 2, 3, and 4. However, this document is not for implementation but to identify needs, gaps, and opportunities, and the road diet may be kept as part of the overall discussion. It is important to note that the analysis performed with the road diet scenario results may result in significant impact to overall vehicle operations and efficiency of the facility.

Figure 4.5 illustrates the estimated daily volumes for Mid-Term (2028) Conditions. For more detailed traffic operations analysis, see **Appendix A**.

Figure 4.5 – Mid-Term (2028) Conditions Daily Volumes

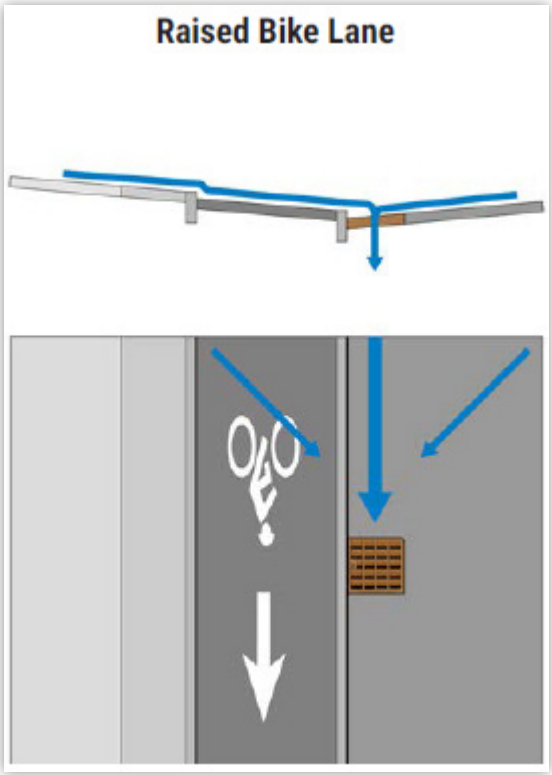


Segment 1: State Route 1 to Sonoma Avenue

This segment is the busiest on State Route 218 and currently has no bicycle facilities. It is recommended to narrow the travel lanes and add cycletracks in both directions. The cycletracks could be constructed with a raised lane or at street level with posts as protection. Examples of raised cycletrack are shown in **Figure 4.6**. The incorporation of storm water drainage is anticipated to be designed as shown in **Figure 4.7**.

Figure 4.6 – Raised Cycletrack Examples [1]

Figure 4.7 – Raised Cycletrack Drainage Design [2]



[1] *(National Association of City Transportation Officials (NACTO), 2014)*
[2] *MassDOT Separated Bike Lane Planning and Design Guide, Exhibit 3P, 2015*

Examples of protected cycletracks with posts is shown in **Figure 4.8**.

Figure 4.8 – Protected Cycletrack with Posts Example [3]

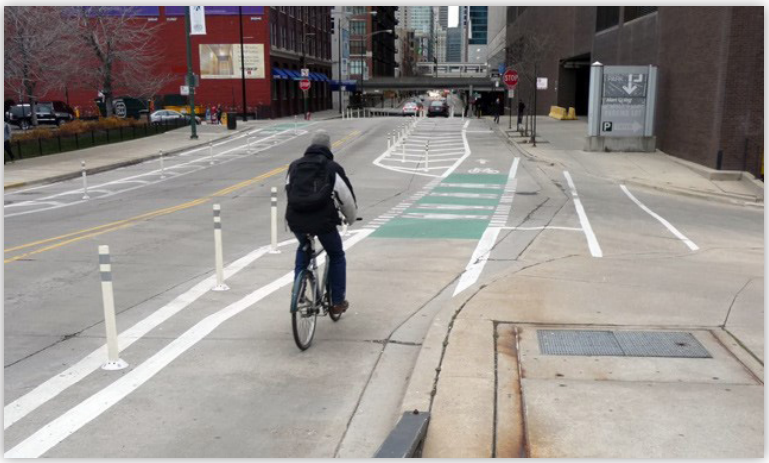
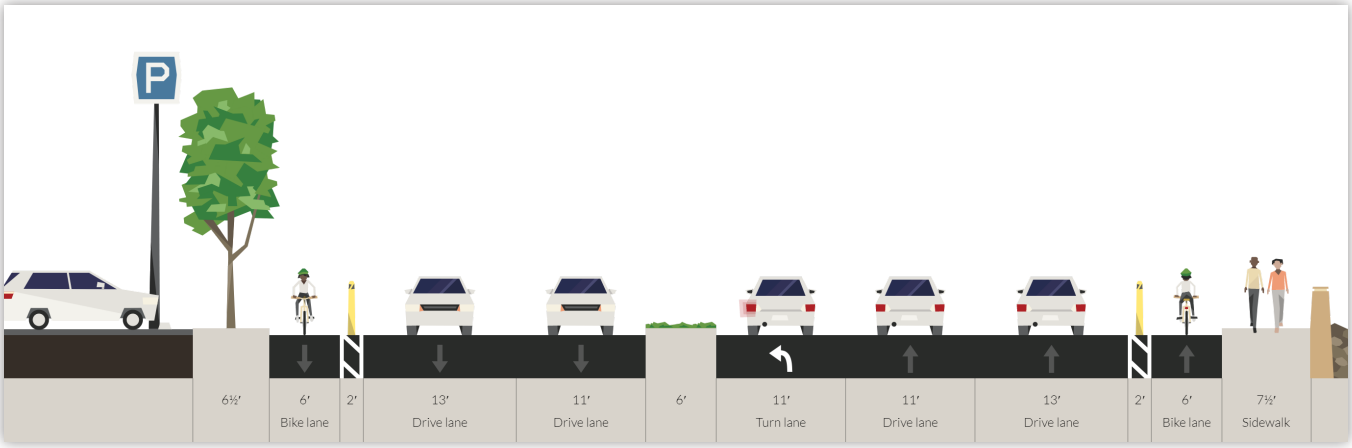


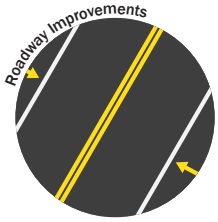
Figure 4.9 shows the recommended typical section for this segment. Posts are shown in the 2-foot buffer rather than a raised curb for illustrative purposes but either design treatment is acceptable for a cycletrack (Class IV).

Figure 4.9 – Segment 1 Mid-Term Typical Section

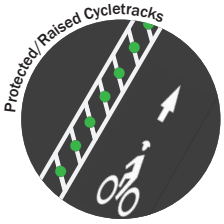


[3] *(National Association of City Transportation Officials (NACTO), 2014)*

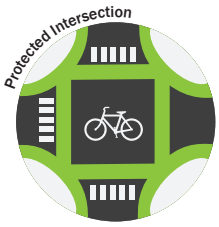
Segment 1 Recommendations:



- Narrow the travel lanes to 11 feet.



- Add green bicycle striping at intersections.
- Install cycletracks (Class IV) in both directions.



- Install a Protected Intersection at Del Monte Blvd.

For further detail see **Appendix G**, *Mid-Term Proposed Layouts.*

State Route 218 & Del Monte Boulevard Protected Intersection

The intersection of State Route 218 and Del Monte Boulevard is recommended to be converted to a protected intersection. A conceptual layout of the recommended improvements is shown in **Figure 4.10.** A protected intersection is set up to maintain cycletracks through an intersection and reduce the mixing zone area between vehicles and bicycles.

Common aspects of a protected intersection are:

- ***Tighter curb returns*** – reduces vehicle turning speeds.
- ***Forward stop line for bicycles and pedestrians*** – placing the crossing location of bicycles and pedestrians ahead of the vehicle stop line allows for greater visibility from turning motorists and shortens the crossing distance.
- ***Cycletrack bend out*** – redirecting the bicycle lane to the right through the intersection allows for turning vehicles to cross the bicycle lane and crosswalk more perpendicular, which provides greater visibility of crossing bicycles and pedestrians from turning motorists.
- ***Two-stage left turns*** – the curb bulb out areas allow for bicycles to make left turns without weaving into vehicle lanes or using crosswalks.

Figure 4.10 – Del Monte Blvd Protected Intersection

The Del Monte Boulevard protected intersection will enhance the bicycle connectivity from the Monterey Peninsula Recreational Trail, proposed State Route 218 cycletracks, and planned bicycle facilities north on Del Monte Boulevard.

Current examples of protected intersections in Northern California include the intersection of Alameda and Hopkins Street in Berkeley, CA (**Figure 4.11**) and the intersection of Stanley Boulevard and Valley Avenue in Pleasanton, CA (**Figure 4.12**). Protected intersections, although they have been implemented, are considered "experimental" by the California Manual on Uniform Traffic Control Devices and may require special approval from the Federal Highway Administration. Caltrans guidance on the design of protected intersections is provided in the Design Information Bulletin 89 for Class IV Bikeway Guidance.

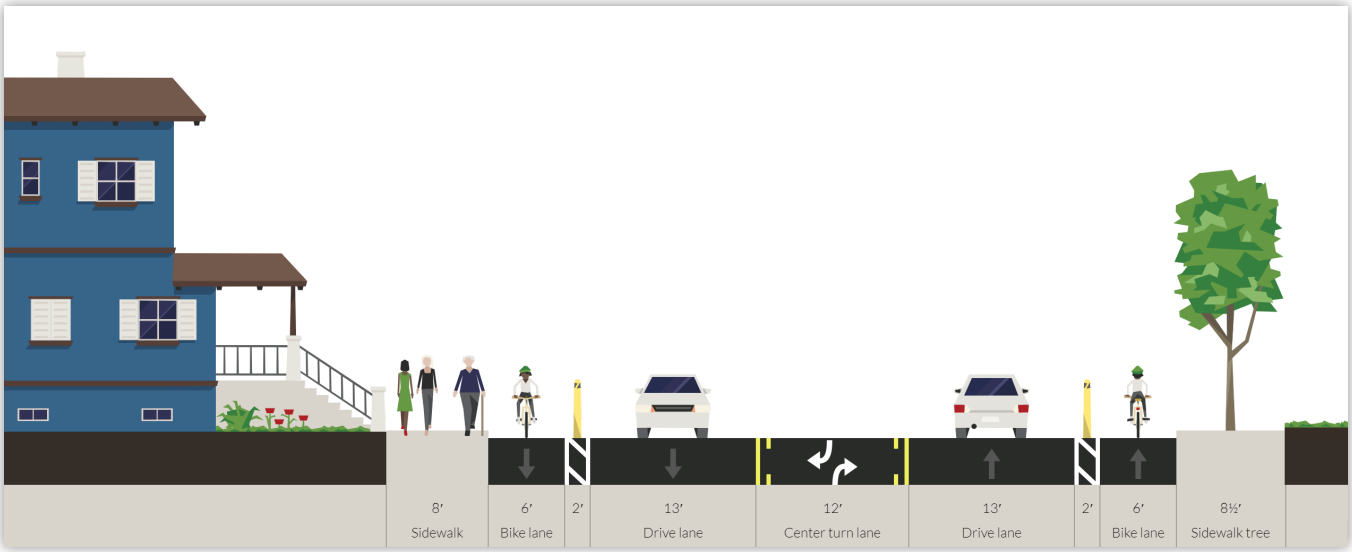
Figure 4.11 – Protected Intersection Example in Berkeley, CA

Figure 4.12 – Protected Intersection Corner Example in Pleasanton, CA

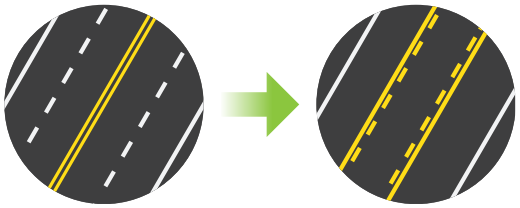
Segment 2: Sonoma Avenue to Hilby Avenue

A road diet is recommended from Sonoma Avenue to Hilby Avenue. A road diet is the reduction of lanes from the roadway to repurpose the space for other uses and travel modes. The reduction in lanes between Sonoma Avenue and Hilby will provide sufficient space for continuous sidewalk and cycletracks on both sides of State Route 218. Reductions in lanes may reduce capacity in roadways, however in urban conditions such as SR 218, intersections control the capacity on a collector road. The road diet does not decrease capacity at the intersections to unacceptable levels as indicated in the Level of Service analysis in **Appendix A**. **Figure 4.13** depicts the typical section for this segment. **Figure 4.14** shows the cross section of State Route 218 at the proposed bus pullouts between Harcourt Avenue and Hilby Avenue.

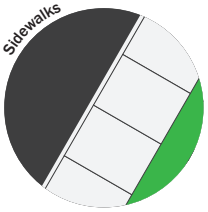
Figure 4.13 – Segments 2 and 3 Mid-Term Typical Section



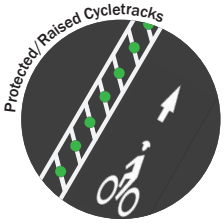
Segment 2 Recommendations:



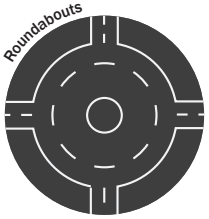
- Narrow the roadway from four lanes, to two lanes with a two way left turn lane



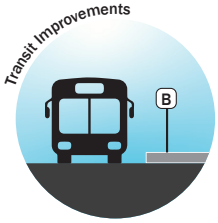
- Add sidewalks in both directions.



- Add green bicycle striping at intersections.
- Install cycletracks (Class IV) in both directions



- Install a Roundabout at Harcourt Ave



- Add bus pullouts in both directions between Harcourt Ave and Hilby Ave

For further detail see **Appendix G**, *Mid-Term Proposed Layouts.*

Bus Pullouts & Bus Islands

Monterey-Salinas Transit, the local transit agency, currently has a bus stop just south of the Department of Motor Vehicles building, however, the road diet will provide space for MST to relocate the bus stop to a more central location. This will provide greater area for amenities and greater pedestrian access. It also gives an opportunity for a paired bus stop to be able to provide transit service in both directions along SR 218.

Figure 4.14 – Pandora Avenue Cycletrack and Bus Stop, Victoria, British Columbia. [4]

The proposed bus pullouts are "bus islands" or "floating bus stops" and are elevated bus stops in which the bicycle lane or cycletrack passes behind the bus stop. This prevents potential conflicts between bicycle lanes and buses when they pull out into traffic. The bus stops can be designed with a raised crosswalk which acts as a bicycle speed bump, shown in **Figure 4.14**, or the bicycle facility can be raised to crosswalk level, shown in **Figure 4.15**. Striping and signing can be incorporated to provide direction on right-of-way between bicycles and pedestrians and should be designed to consider wheelchair access. The 8-foot-wide bus island should accommodate an assessible route to a bus landing area

[4] *https://www.cheknews.ca/victorias-first-protected-bike-lanes-open-monday-309850/*

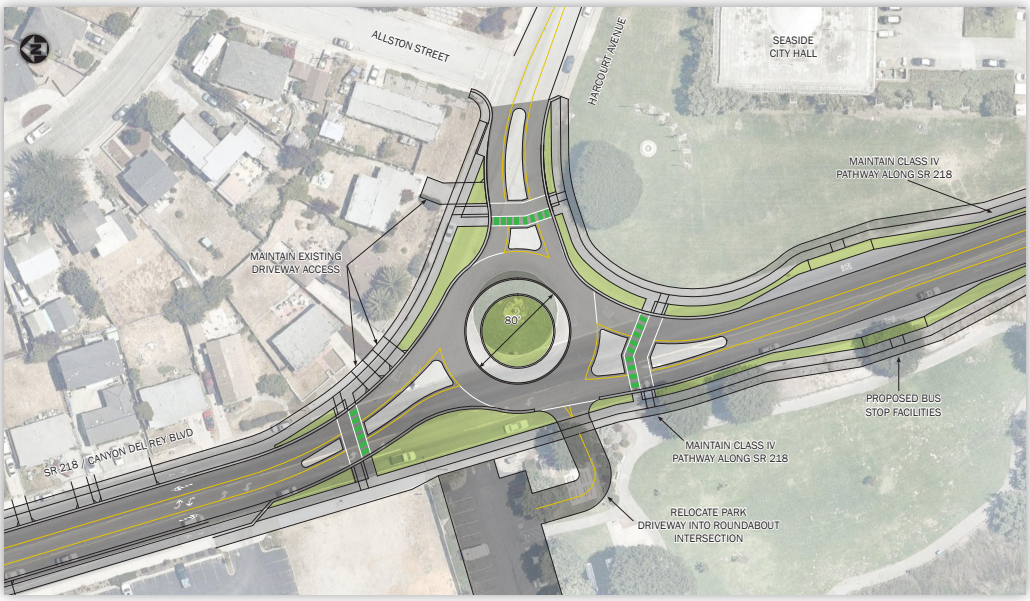
Figure 4.15 – Hearst Avenue Cycletrack and Bus Stop, Berkeley, CA [5]

State Route 218 & Harcourt Avenue Roundabout

The intersection of State Route 218 and Harcourt Avenue was identified as a good candidate for conversion from a side-street stop-control intersection to a roundabout. The existing Y-intersection has an abnormal lane geometry with both road segments from Harcourt Avenue allowing two-way traffic. The wide existing right-of-way at the intersection allows for a roundabout to be implemented within the existing right-of-way. **Figure 4.16** depicts a conceptual layout of the proposed roundabout.

The implementation of a roundabout would have many benefits. Additional pedestrian and bicycle crossings would enhance multimodal access to nearby key destinations, such as Seaside City Hall and Library and Laguna Grande Regional Park. The roundabout would also remove the confusing lane geometry at Harcourt Avenue and ease left turns onto State Route 218.

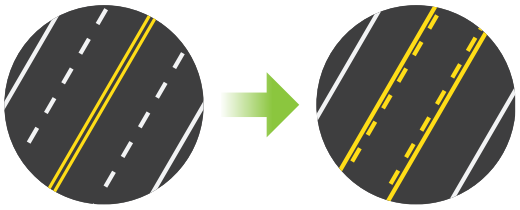
Figure 4.16 – Harcourt Avenue Roundabout



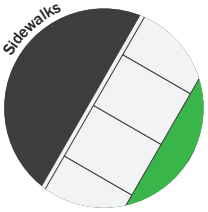
[5] *https://bikeeastbay.org/Hearst*

Segment 3: Hilby Avenue to Fremont Boulevard

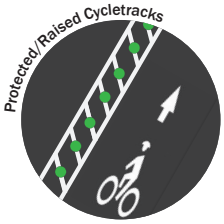
A road diet is also recommended from Hilby Avenue to Fremont Boulevard. This will provide space for continuous sidewalk and cycletracks on both sides of State Route 218. **Figure 4.13** depicts the typical section for this segment.



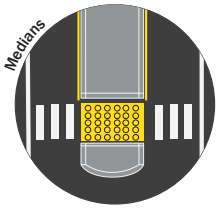
- Narrow the roadway from four lanes, to two lanes with a two way left turn lane



- Add sidewalks in both directions.



- Add green bicycle striping at intersections.
- Install cycletracks (Class IV) in both directions

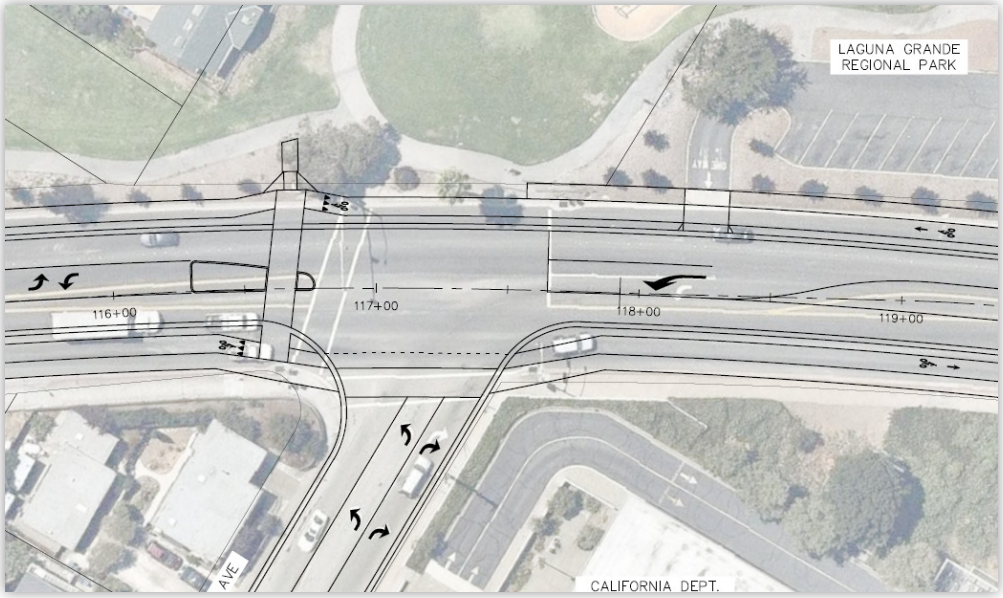


- Provide a median for the pedestrian crossing at the northbound approach at Hilby Ave Intersection

For further detail see **Appendix G**, *Mid-Term Proposed Layouts.*

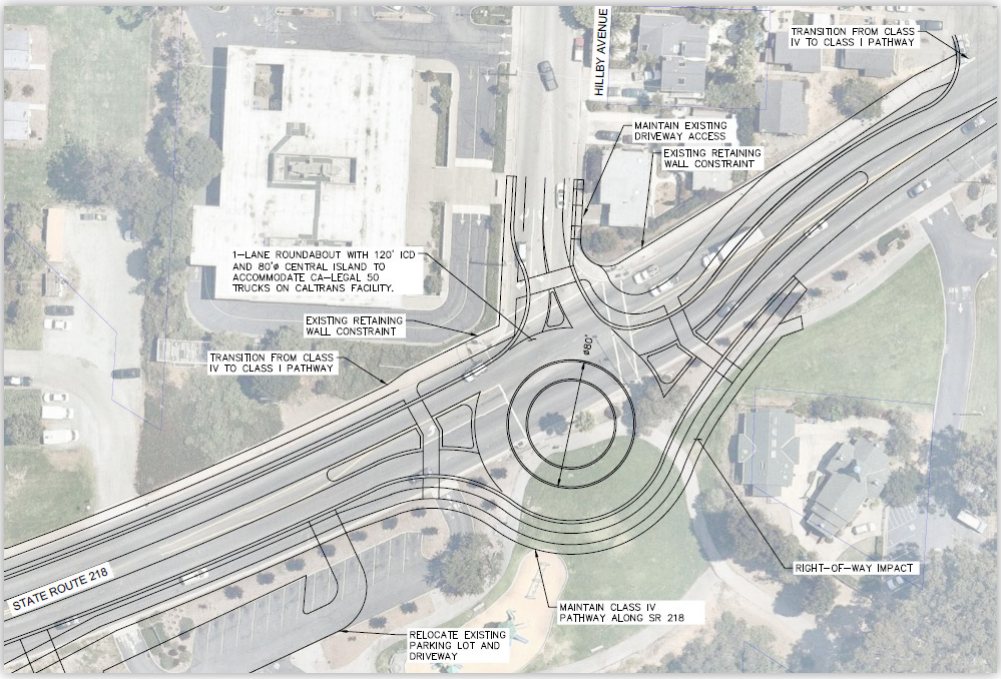
State Route 218 & Hilby Avenue Intersection

Figure 4.17 – Hilby Avenue Intersection Improvements



The intersection of State Route 218 and Hilby Avenue was identified as a potential candidate for conversion from a signalized intersection to a roundabout. A roundabout will operate at acceptable levels in mid-term conditions, however, the footprint of the roundabout would impact the Laguna Grande Regional Park's recreational areas and reduce the parking supply. Also, the roadway would become closer to the adjacent playground and Saint Seraphim's Russian Orthodox Church. The preferred alternative is to instead provide treatments to continue bicycle access at the intersection and provide a median at the northbound approach for the existing crosswalk. **Figure 4.17** depicts the preferred conceptual layout for Hilby Avenue and **Figure 4.18** depicts the conceptual layout of the roundabout alternative.

Figure 4.18 – Hilby Avenue Roundabout Alternative



Segment 4: Fremont Boulevard to State Route 68

This segment has very little existing sidewalk, mostly near Fremont Boulevard, but has bicycle lanes in the shoulder for a majority of the segment. The main mid-term improvements involve constructing a sidewalk on the north side of SR 218 between Fremont Boulevard and Carlton Drive and constructing a multiuse path between Carlton Drive and SR 68. **Figure 4.19** and **Figure 4.20** show the two main typical sections for this segment.

Figure 4.19 – Segment 4 Mid-Term Typical Section (Fremont Boulevard to Carlton Drive)

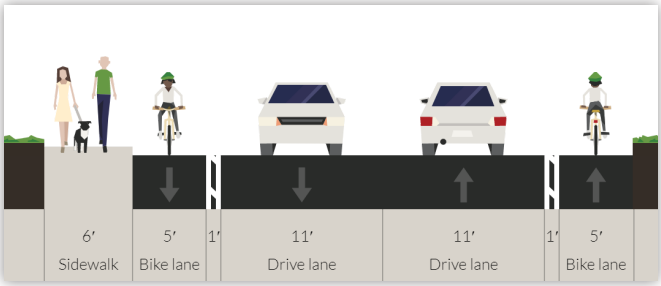
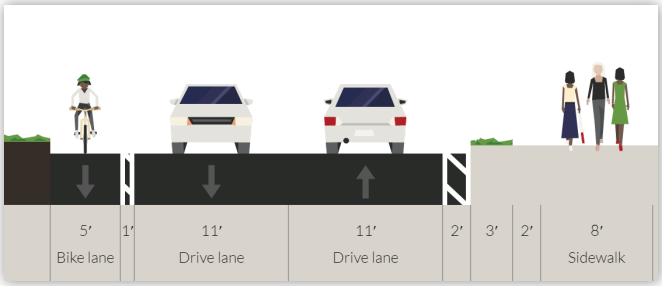
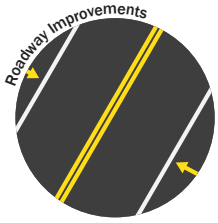


Figure 4.20 – Segment 4 Mid-Term Typical Section (Carlton Drive to State Route 68)

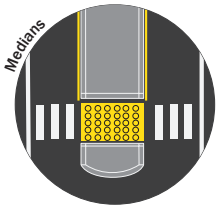


Segment 4 Recommendations:

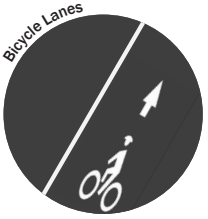


- Narrow the travel lanes to 11 feet.
- Remove right turn pavement marking arrows at Stone Creek Village shopping center driveways.

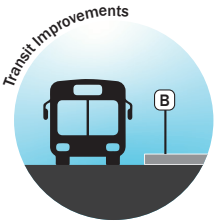
- Widen the sidewalk to a multiuse path between Fremont Blvd and the rear Safeway Driveway.
- Add multiuse path at Rosita Rd roundabout.
- Add multiuse path between Carlton Dr and SR 68.



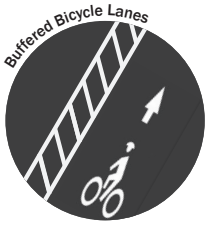
- Construct a raised median opposite of Canyon St and Work Ave to divide the eastbound travel lane with the bicycle lane



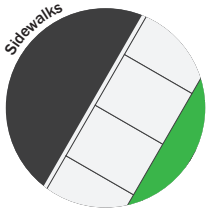
- Stripe new bicycle lane westbound from Pheasant Ridge Rd through General Jim Moore Blvd.
- Sign and stripe westbound shoulder as a bicycle lane from SR 68 to Del Rey Gardens Dr.



- Add bus pullouts eastbound at Del Rey Gardens Dr and westbound at Ryan Ranch Rd.

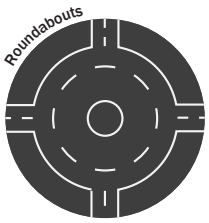


- Add green bicycle striping at intersections.
- Stripe the bicycle lanes with two solid white stripes to create a narrow-painted buffer.



- Connect the existing asphalt path on the south side of SR 218 from east of Safeway to Rosita Rd with a raised sidewalk.
- Add sidewalk on the north side of SR 218 from east of Fremont Blvd to Carlton Dr.

- Stripe the uncontrolled crosswalk at Work Ave perpendicular across SR 218 to shorten crossing time.



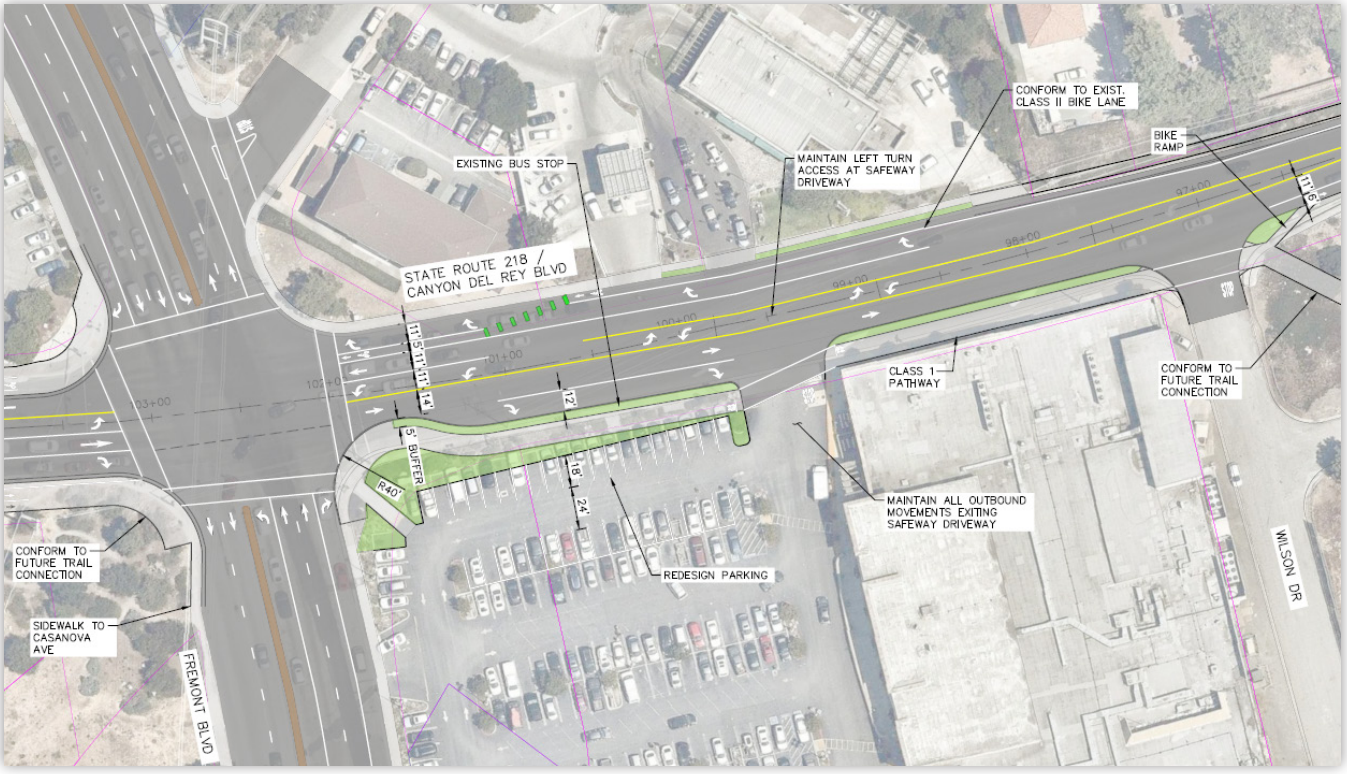
- Install a Roundabouts at Rosita Ave, Carlton Dr and Via Verde.

For further detail see **Appendix G**, *Mid-Term Proposed Layouts.*

State Route 218 & Fremont Boulevard Intersection

Based on the high volumes and the proximity of the existing Safeway driveway on State Route 218 east of Fremont Boulevard, the intersection of State Route 218 and Fremont Boulevard and the Safeway driveway were analyzed together. This intersection was one of the most discussed locations during public meetings due to the concerns and difficulties exiting the Safeway Driveway. This Safeway is one of the few larger grocery stores and serves the residents of Monterey, Del Rey Oaks and Seaside. The driveway on SR 218 is critically important because it is the only driveway in which patrons can exit left to return south to Monterey. The alternative route is to take SR 218 to SR 68, a much longer and circuitous route. Numerous design iterations and discussions were had with Caltrans to determine the best balance between multimodal and other improvements, while maintaining acceptable operations. **Figure 4.21** depicts the preferred concepts of the study. For further details on traffic operations, see **Appendix A**.

Figure 4.21: Fremont Boulevard & Safeway Driveway

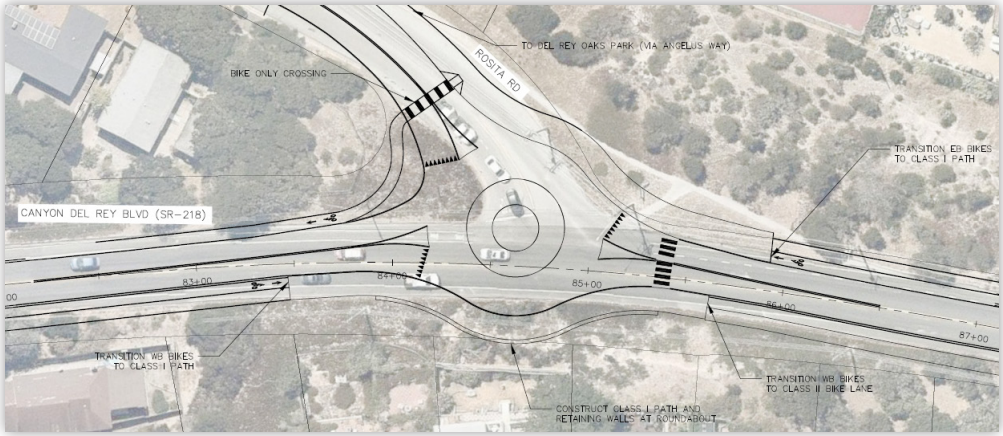


It was discussed to convert the eastbound outside lane to a right turn pocket and, also convert the outside eastbound lane to a right turn pocket at the Safeway driveway. This removes the existing lane merge. By converting the right lane to a right turn pocket, this removes a conflict point for vehicles exiting the Safeway driveway. Rather than trying to find a gap for two through lanes they only need to find a gap for one. Because of the road diet west of Fremont Boulevard, the outside westbound lane is converted to a right turn pocket. The center turn lane stays the same as existing. A multiuse path (Class I) is recommended along the Safeway frontage in order to bridge the gap in the eastbound bicycle facility. Bicycles will transition to bicycle lanes (Class II) at Wilson Drive or connect to the planned FORTAG. The future Fremont Boulevard median cycletracks are planned to terminate at State Route 218.

State Route 218 & Rosita Road Intersection

The intersection of State Route 218 and Rosita Road was identified as a potential location for an urban compact roundabout as shown in **Figure 4.22**. The roundabout would calm traffic in the corridor, aid left turns out onto State Route 218 and provide a pedestrian and bicycle crossing.

Figure 4.22 – Rosita Road Roundabout



State Route 218 & Work Avenue Intersection

The intersection of State Route 218 and Work Avenue has an existing uncontrolled pedestrian crossing on the east leg that connects to the staircase to Adair Place. These stairs were much discussed in community meetings. This is the primary pedestrian connection for residents to cross SR 218 and connect to Del Rey Park. It was discussed to widen and realign SR 218 to the north in order to provide a pedestrian refuge between the eastbound bicycle lane and travel lane. This would allow a pedestrian going north to Work Avenue to climb the stairs and first, cross the eastbound bicycle lane and then cross the travel lanes. **Figure 4.23** shows the existing uncontrolled pedestrian crossing at Work Avenue. **Figure 4.24** shows the proposed conceptual layout and **Figure 4.25** shows the proposed State Route 218 cross section at Work Avenue. See **Figure 4.26** for an example of a similar treatment in place in Sunnyvale, CA.

Figure 4.23 – Existing Work Avenue Pedestrian Crossing

Figure 4.24 – Work Avenue Pedestrian Crossing

Figure 4.25 – Mid-Term Cross Section at Work Avenue

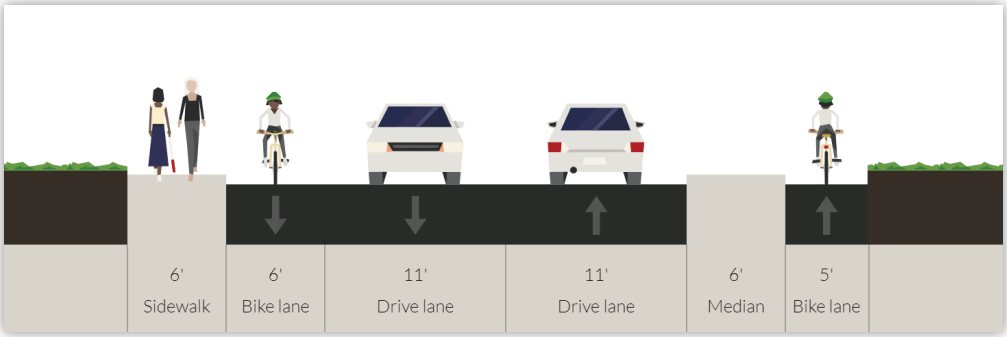
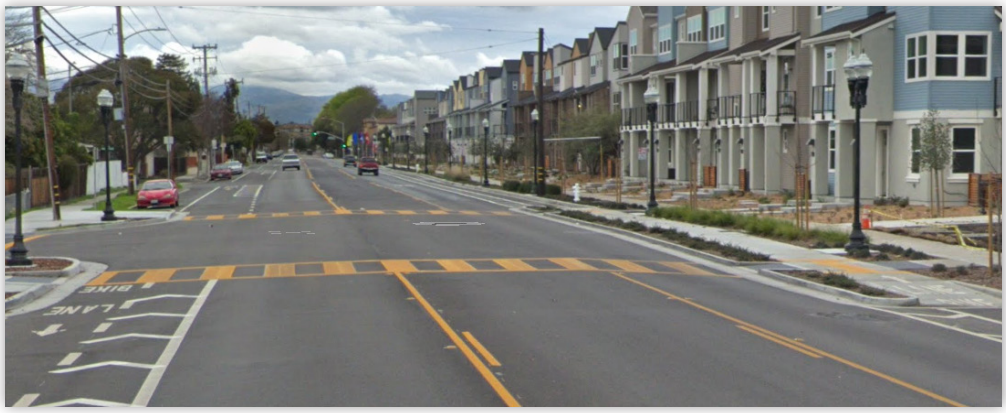


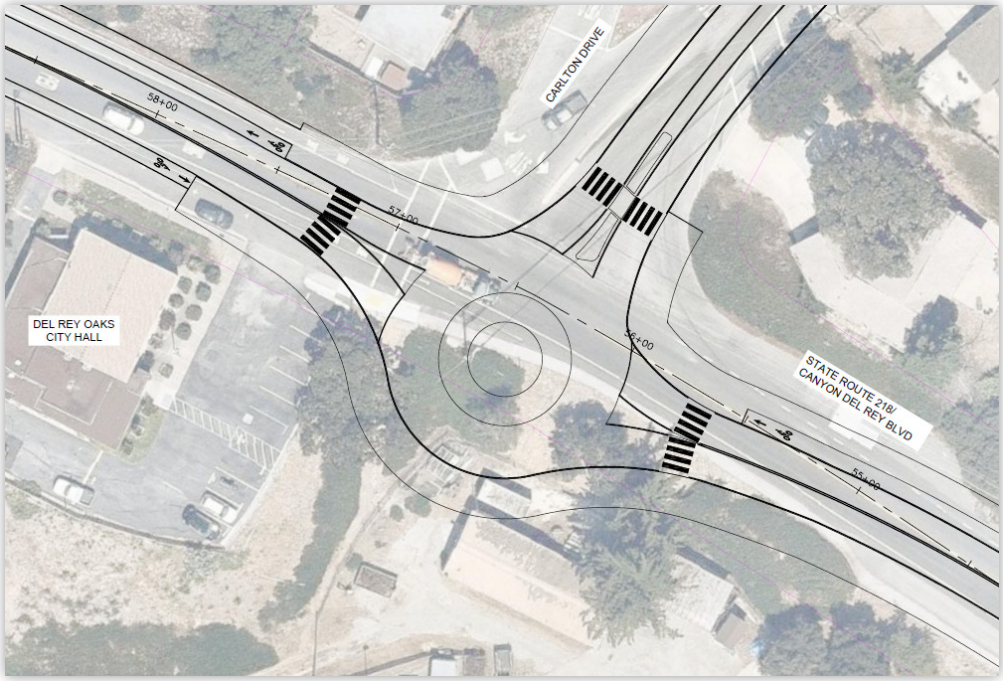
Figure 4.26 – Bicycle Curb Extension at T-Intersection, Sunnyvale, CA



State Route 218 & Carlton Drive Intersection

The intersection of State Route 218 and Carlton Drive provides access to Del Rey Oaks City Hall and the planned FORTAG and was identified as a potential location for an urban compact roundabout as shown in **Figure 4.27**. The roundabout would calm traffic in the corridor, aid left turns out onto State Route 218 and provide pedestrian and bicycle crossings. However, the drawbacks of roundabout implementation include impacts to Del Rey Oaks City Hall, steep grades and the need for extensive retaining walls and grading.

Figure 4.27 – Carlton Drive Roundabout



Several other intersection alternative conceptual layouts were prepared. **Figure 4.28** depicts the Alternative 1 improvements to the Carlton Drive and Work Avenue intersection and the northeast corner of State Route 218 and Carlton Drive intersection.

Figure 4.28 – Carlton Drive Alternative 1

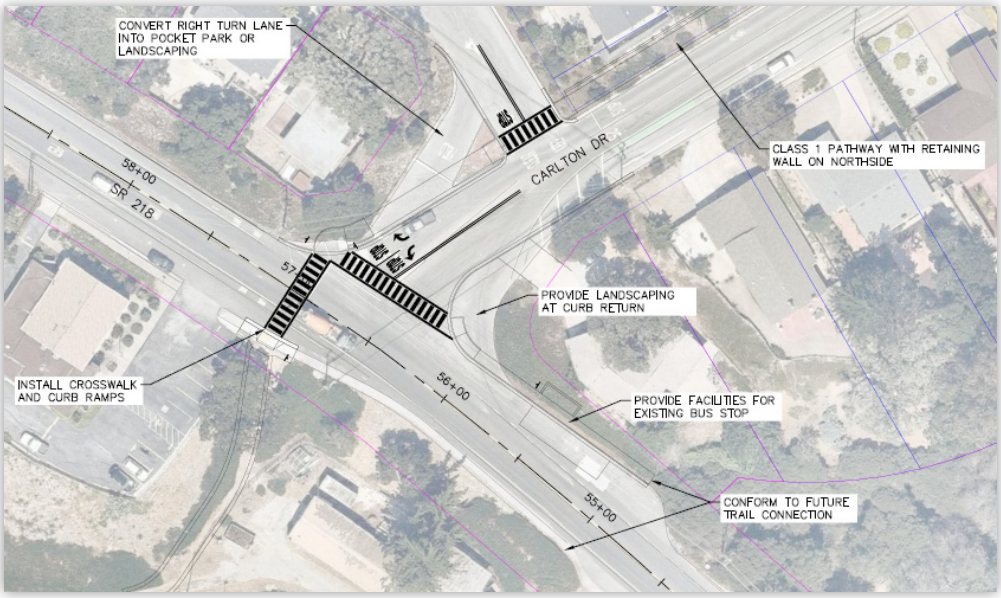
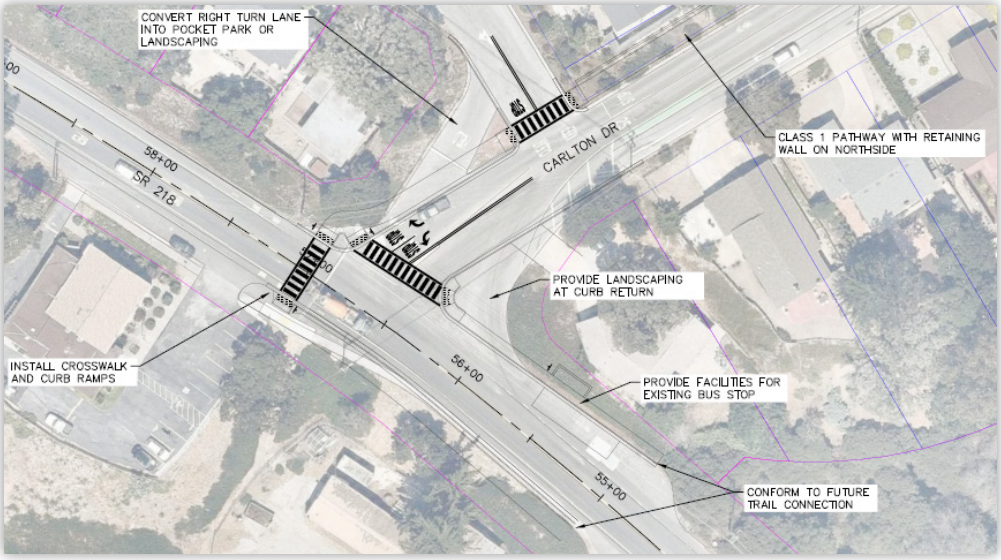


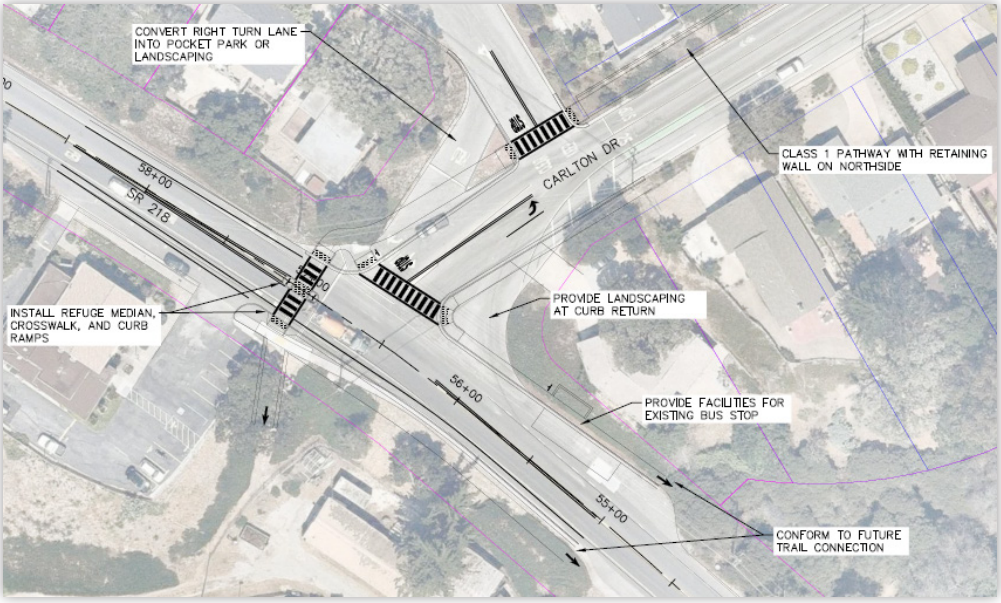
Figure 4.29 shows the Alternative 2 recommendations are similar to Alternative 1 but with smaller curb returns and narrower lanes.

Figure 4.29 – Carlton Drive Alternative 2



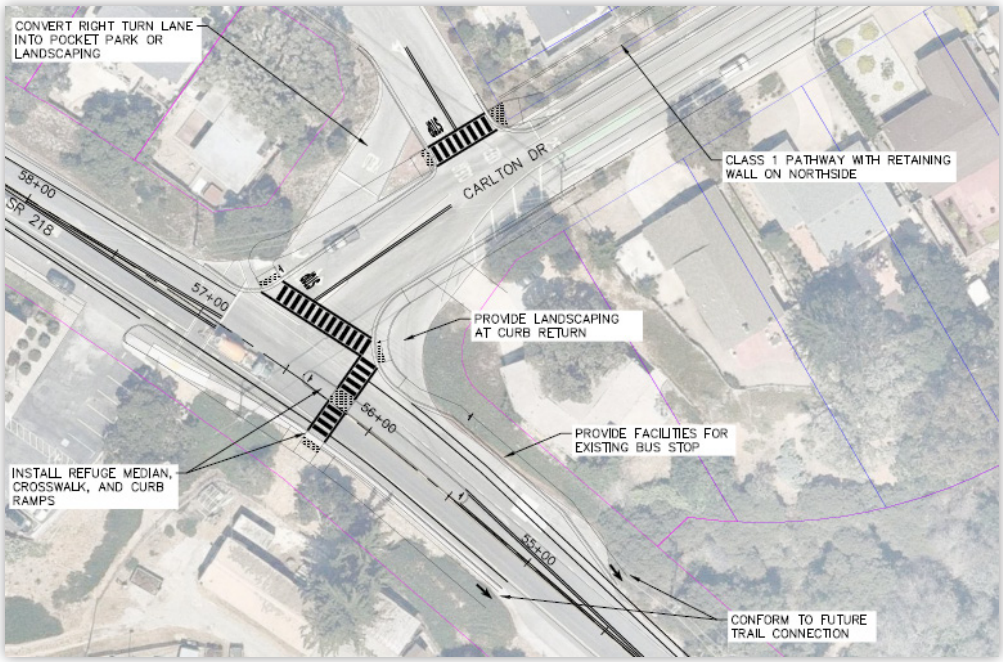
Alternative 3 is shown in **Figure 4.30** and is similar to Alternative 2 but provides a pedestrian refuge island on the State Route 218 trail crossing.

Figure 4.30 – Carlton Drive Alternative 3



Alternative 4 is shown in **Figure 4.31** and provides a crossing with a pedestrian refuge island on the east leg of the intersection instead of the west leg.

Figure 4.31 – Carlton Drive Alternative 4

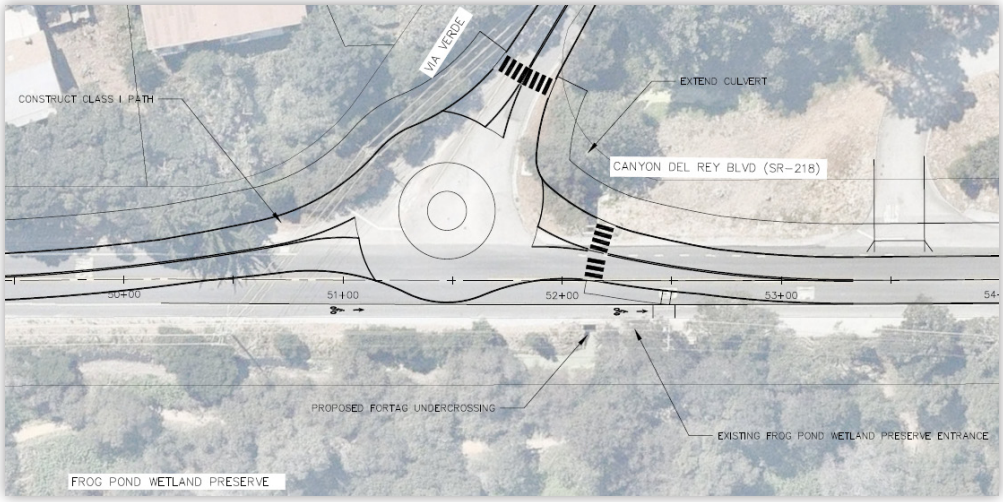


No preferred alternative for the intersection with Carlton Drive has been selected.

State Route 218 & Via Verde Intersection

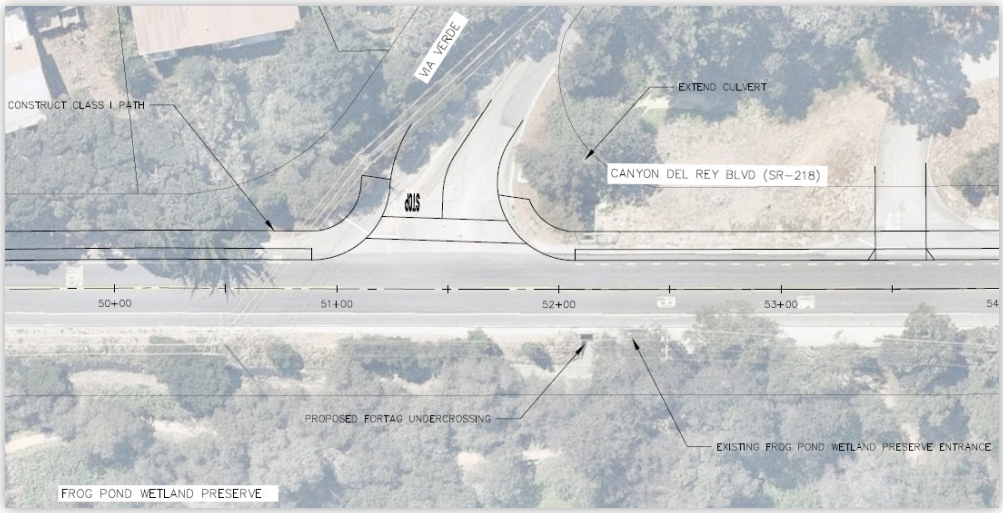
The intersection of State Route 218 and Via Verde was identified as a potential location for an urban compact roundabout show in **Figure 4.32**. The roundabout would calm traffic in the corridor, aid left turns out onto State Route 218 and provide a pedestrian and bicycle crossing to the Frog Pond Wetland Preserve.

Figure 4.32 – Via Verde Roundabout



If a roundabout is not chosen for implementation at Via Verde, **Figure 4.33** shows an alternative conceptual layout for the intersection. The multiuse path (Class I) will be maintained along a straight alignment and a crosswalk will be added across Via Verde.

Figure 4.33 – Via Verde Alternative 1



State Route 218 & General Jim Moore Boulevard Intersection

General Jim Moore Boulevard has existing bicycle lanes (Class II) and is the main bicycle route on the east side of the City of Seaside. Recommended improvements to the intersection of State Route 218 and General Jim Moore Boulevard are shown in **Figure 4.34**. The recommendations include removing the northbound merge lane, reconstructing both curb returns to allow more space for pedestrians and shorter crossings, narrowing the travel lanes on General Jim Moore Boulevard, adding a crosswalk to the east leg and bicycle crossings to the west and east legs, and creating a protected corner to aid bicycle crossings. **Figure 4.35** depicts an example of a protected intersection.

Figure 4.34 – General Jim Moore Boulevard Mid-Term Improvements

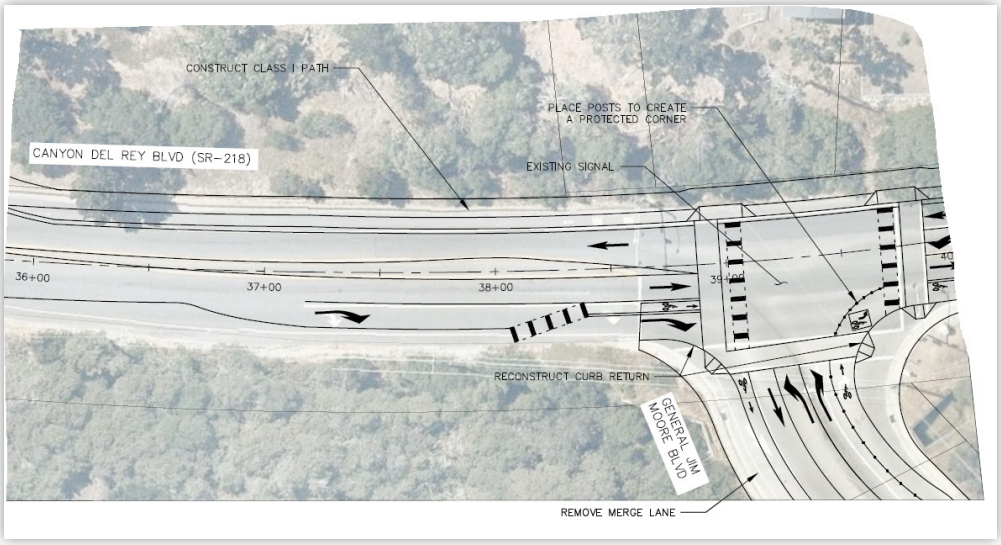


Figure 4.35 – Protected Corner, San Jose, CA [6]

State Route 218 & State Route 68 Intersection

The intersection of State Routes 218 and 68 has been analyzed as a roundabout under a separate study. The State Route 218 mid-term improvements have been designed to conform to those plans. The State Route 68 roundabout is shown in **Figure 4.36**.

Figure 4.36 - State Route 68 Roundabout Concept

5. IMPLEMENTATION CONCEPTS/DISCUSSION

This chapter contains six sections dealing with implementation of the proposed concepts discussed in the previous chapter:

- Cost Estimates for the Improvements Shown
- Potential Funding Sources
- Corridor Relinquishment
- Environmental Considerations
- Next Steps for Implementation.

Cost Estimate

Based on the improvements stated in the Recommendations section and the layouts in **Appendix F and G**, planning level cost estimates were developed for both the short-term and mid-term improvement scenarios. Estimated costs are further broken down per roadway study segment and shown in **Table 5.1**. The table also notes which segments are located within each city limits. Segments 1, 2, and 3 are located within the City of Seaside and Segment 4 is located within the City of Del Rey Oaks. These segments do not lie entirely within the one city listed, as several city limits meet near SR 218, but serve as an estimate for the potential relinquishment process. See the Caltrans Relinquishment section for more information on the potential relinquishment process.

Table 5.1 - Cost Estimate Summary by Segment

Jurisdiction	Segment	Short–Term	Mid-Term
Seaside	1: SR 1 to Sonoma Ave	$625,670	$5,490,812
	2: Sonoma Ave to Hilby Ave	- -	$9,662,441
	3: Hilby Ave to Fremont Blvd	- -	$2,373,916
Del Rey Oaks	4: Fremont Blvd to SR 68	$1,768,538	$67, 889,871
	Total	**$2,384,208**	**$85,417,041**

Source: Kimley-Horn, 2019

Approximate quantities of major improvement items, i.e. sidewalk, multiuse path, signal, curb, striping, etc., were calculated and multiplied by estimated unit costs to determine total costs per improvement item. These major items were sub-totaled and escalation factors were applied to account for soft costs (project management, environmental review, civil engineering design, construction management, etc.), contingency and minor improvement items that were not quantified. All items are noted in 2019 dollars and were not grown to a future date to account for inflation when the improvements would be constructed. For a detailed breakdown of the quantified improvement items, costs and notes, see **Appendix H**.

Funding Sources

Many of the proposed long-term projects will be at a substantial cost. Due to the size of the City of Del Rey Oaks and the City of Seaside, it is unlikely they will be able to fully fund these infrastructure projects. Although the cities may not be able to fund the projects solely, there are multiple opportunities for funding through the regional transportation agency, TAMC, and other State grants. Many of these improvements can be phased and incorporated into larger projects such as the Fort Ord Regional Trail and Greenway (FORTAG) Project or other improvements. **Table 5.2** lists potential future grant funding opportunities for corridor improvements.

Table 5.2 – Potential Funding Sources

Funding Program	Administering Agency	Program Description	Potential Funded Projects
Active Transportation Program (ATP)	California Transportation Commission (CTC)	A competitive state-level grant that funds in both infrastructure and non-infrastructure projects that focus of improving access and safety for bicycles, pedestrians and transit modes.	Sidewalk gaps, crossing enhancements, bikeways, Safe Routes to School activities, other programmatic activities.
Highway Safety Improvement Program (HSIP)	Caltrans	A competitive state-level grant program that is focused on funding projects that reduce traffic fatalities and serious injuries by correcting or improving a specific issue.	Improvements that target causes of collisions involving pedestrians or cyclists in the corridor, projects types depending on cycle priorities.
Solutions for Congested Corridor Program (SCCP)	California Transportation Commission (CTC)	A competitive state-level funding project which is designed to reduce congestion in congested corridors	Sidewalks, paths, crossing improvements, bicycle lanes, bicycle parking, bus stop improvements
Regional Surface Transportation Program (RSTP)	TAMC	A local grant that is distributed on a fair-share and a competitive basis to local jurisdictions for transportation projects.	Sidewalk gaps, crossing enhancements, intersection redesigns / roundabouts, bikeways.
Transportation Safety & Investment Plan (Measure X)	TAMC	A local sales tax measure used to fund local transportation projects. A grant that is distributed on a fair-share and a competitive basis to local jurisdictions for transportation projects.	Sidewalk gaps, crossing enhancements, intersection redesigns / roundabouts, bikeways. Measure X funding must be used with a 60% local share.

Caltrans Relinquishment

As noted in the 2016 State Route 218 (SR 218) Transportation Concept Report, SR 218 primarily serves the local residential and commercial traffic and therefore a potential candidate for right-of-way relinquishment. If Caltrans were to relinquish the State Route 218 Corridor ownership would then transfer to the Cities of Del Rey Oaks and Seaside which it currently runs through. There are several benefits and drawbacks which should be considered when acquiring right-of-way from Caltrans. Due to the fact that State Route 218 is under Caltrans jurisdiction, there is less flexibility in street design and longer permit approval process including changes to the street, even for a fronting development project.

The relinquishment process can be an extensive multi-year process which may require approval by Caltrans District 5, Caltrans Headquarters, the California Transportation Commission (CTC) and/or the Federal Highway Administration. The SR 218 corridor would need to follow the relinquishment by legislative enactment process. The minimum typical timeline for relinquishment is 41 months but can take longer depending on negotiations on the terms of relinquishments and the legislative sponsorship. Legislative sponsorship is the presentation of a bill or resolution for consideration by a State legislative representative.

The first step in the process is for the local agency to request Caltrans to initiate the relinquishment process. Alternatively, Caltrans may initiate the process independently. Caltrans Districts will work with Caltrans Headquarters to prepare a Relinquishment Assessment Report (RAR). A RAR assesses the benefit of maintaining state ownership of the state route. After the RAR is approved and it is determined that it is in the best interest for the state to relinquish the state route, the Caltrans District can enter negotiations with the affected local agencies. Based on the terms of relinquishment, Caltrans then enters the second phase of the relinquishment process and proceeds with the “No Cost, Financial Contribution Only”, or “Capital Project” relinquishment process.

A "No Cost" process is a relinquishment process in which Caltrans cannot provide any funding for road improvements or rehabilitation prior to relinquishment. Additionally, the local agencies may be requested to fund a study which evaluates the environmental, engineering and other aspects of the subject roadway and includes a survey identifying the boundaries of the right-of-way changing hands, a prerequisite for a land transfer of this nature. In addition to Caltrans approval, the CTC and local agencies affected by the relinquishment must adopt a resolution agreeing to the land transfer.

Alternatively, SR 218 may be relinquished through a financial contribution only process or Capital Project meaning that Caltrans Headquarters must agree to funds or project scope requested in the negotiation with the local agency. Any additional investment to the state route would require a benefit-cost analysis to show that it is in the State's benefit to provide a financial contribution to facilitate negotiations between Caltrans and the local agency. In additions to Caltrans approval, the CTC and local agencies affected by the relinquishment must adopt a resolution agreeing to the land transfer.

Appendix I shows the Relinquishment by Legislative Enactment process in the Caltrans Project Development Procedures Manual.

A drawback to the relinquishment process is the maintenance cost that would be undertaken by the City of Del Rey Oaks and Seaside. **Table 5.3** below shows a summary of on-going maintenance costs on SR 218 by Caltrans between 2012 and 2017. Seaside and Del Rey Oaks could expect similar maintenance cost on SR 218. The costs are based on Caltrans labor, vehicle and material costs and may differ from the cost to local agencies.

Table 5.3 - SR 218 Caltrans On-going Maintenance Costs by Jurisdiction, 2012 - 2017

	Total Cost	Average Cost Per Year	Average Cost Per Mile Per Year
Del Rey Oaks	$85,721	$15,825	$8,527
Seaside	$76,958	$14,208	$14,293
Total	**$162,679**	**$30,033**	**- -**

Source: Caltrans, 2018

Note: The costs included in this table are aggregate on-going maintenances costs from July 2012–November 2017, 5 years and 5 months. The segment length of SR 218 in Seaside is 0.994 miles and 1.856 in Del Rey Oaks

See **Appendix J** *for further details.*

Environmental Considerations

Construction of the State Route 218 roadway improvements may have some adverse impacts. Potential environmental constraints include impacts to aesthetics, biological resources, cultural and tribal cultural resources, geology and soils, hydrology and water quality, and noise.

Aesthetics

Grading, which may be required, and the removal of native vegetation may detract from the scenic quality of views from SR 218. Although State Route 218 is not an officially designated scenic highway, the aesthetics still may be impacted by grading and vegetation removal.

Biological Resources

Removal of native vegetation may also impact biological resources by removing the native vegetation cover, including forest, chaparral, and open grassland communities. Several special-status plant and animal species could occur in the study area and could be harmed by road improvement construction activities. In addition, the study area may support riparian or wetland vegetation communities, which are considered sensitive and may contain jurisdictional waters. Site-specific reconnaissance surveys will be needed to ascertain the presence and extent of these resources within the study area and permitting would be required in accordance with applicable regulations.

Cultural Resources

The Monterey peninsula has a well-known history of indigenous peoples and as a result there is a high probability of a cultural resource to be located near the study corridor. Construction of the road improvements would involve ground disturbing activities that would have the potential to impact archaeological resources. Future environmental review of the SR 218 road improvements would require consultation with Native American tribes that have requested formal notification from applicable lead agencies under Assembly Bill 52 to identify potential tribal cultural resource impacts and a cultural resources technical study to identify cultural resources within the study area.

Geology and Soils

Certain soils within the study area have been identified to have moderate erosion hazard and linear extensibility. Therefore, threats due to expansive soils and due to soil erosion would need to be addressed prior to implementation.

Hydrology and Water Resources

Construction of the road improvements could accelerate soil erosion and sedimentation of surface waters. Increased impervious surfaces from multilane roundabouts and road widening improvements would change site drainage patterns that could lead to erosion and sedimentation leading to impacts to downstream water flow and quality. Changes to site drainage could result in offsite flooding and erosion, as well as require expanded stormwater drainage facilities. The project would not be expected to impede or redirect flood flows or expose people or structures to the 100-year floodplain.

Noise

Construction of the road improvements on SR 218 would result in potential temporary construction-related noise and vibration. However, operational traffic noise is not anticipated to substantially increase.

Environmental impacts will be studied in greater detail when the project enters the design phase, impacts to the environment will be dependent on the final project area and scope of improvements. Further discussion of the Environmental Considerations can be found in **Appendix K**, *Canyon Del Rey (SR 218) Improvement Project: Environmental Fatal Flaw Analysis by Rincon Consultants.*

Next Steps

Implementing the projects proposed in the Mid-Term Recommendation will take several years, however there are a number of Short-Term projects which are currently in progress or can be implemented much sooner.

Below are a series of potential "next steps" to be implemented as funding and staff availability permits:

- Conduct detailed traffic studies and analyses (including initiating a formal Intersection Control Evaluation (ICE) for the intersections with proposed roundabouts).
- Conduct a right-of-way survey to verify the width and boundaries of the Caltrans right-of-way along the corridor and to determine the extent of encroachment by private property into the right-of-way.
- Conduct a topographic survey to verify roadway grade and determine the need for retaining walls or other supporting features.
- Conduct an archeological survey to identify potential cultural or archeological resources in and around the project area.
- Refine the concepts behind the designs presented in this report and develop preliminary engineering drawings, including dimensions and measurements. Also, begin initial studies under the California Environmental Quality Act (CEQA) for environmental review of the projects or National Environmental Policy Act (NEPA) if applicable.
- Continue to explore the process of corridor relinquishment, whereby Caltrans would cede control of Canyon Del Rey Boulevard State Route 218 to the Cities of Seaside and Del Rey Oaks.
- Strengthen and support enforcement of traffic laws in the corridor through regular enforcement campaigns and a variety of educational and awareness materials.
- $500,000 of SB 1 Local Partnership Program funds and $500,000 of Transportation Development Act funds have been allocated for the preliminary design and environmental impact studies of the Fort Ord Regional Trail and Greenway. In late 2018, the TAMC board awarded the contract for design and environmental services to Alta Planning and Design following a competitive RFP process. This was scoped to include the connections at Fremont Boulevard and Frog Pond Wetland Preserve. The preliminary design will provide more detail on the design footprint, feasibility and cost of the connections. The SR 218 Corridor Study evaluated these connections at a conceptual level only. TAMC will be applying for future funds to construct the Del Rey Oaks segment between Fremont Boulevard and Carlton Drive.
- The Monterey Regional Airport Master Plan was completed while the SR 218 corridor study was underway. This Master plan is proposing additional access to the airport from SR 218 at Del Rey Gardens. This connection will provide access to the relocated airport hangers, as well as, fire station access. It may also provide general access for future airport expansion. It is not the purpose of this study to address the feasibility of the new access. It is however recommended that any proposed access improvements incorporate the principles of this study and continue the multimodal facilities and access along the corridor.

6. APPENDICES

Appendix A: Transportation Systems Operations

Appendix B: Intersection Traffic Counts

Appendix C: City Circulation Maps

Appendix D: SWITRS Traffic Collisions (2013 – 2017)-

Appendix E: Community Outreach Summaries

Appendix F: Short-Term Conceptual Layout Recommendations

Appendix G: Mid-Term Conceptual Layout Recommendations

Appendix H: Cost Estimates

Appendix I: Caltrans Relinquishment by Legislative Enactment Process

Appendix J: Caltrans On-Going Maintenance costs, 2012 – 2017

Appendix K: Collision Data

Appendix L: Canyon Del Rey (SR 218) Improvement Project: Environmental Fatal Flaw Analysis, Rincon Consultants

Appendix A.1: Synchro Output Sheets – Existing Conditions

Appendix A.2: Synchro Output Sheets – Short-Term (2023) Conditions

Appendix A.3: Synchro Output Sheets – Mid-Term (2028) Conditions

Appendix A.4: Synchro Output Sheets – Mid-Term Improvement Conditions

Appendix A.5: Caltrans Review of Fremont Boulevard Alternatives

Appendix A.6: SimTraffic Simulation Outputs

APPENDIX A | TRANSPORTATION SYSTEM OPERATIONS

This section presents the results of the roadway and traffic operation impacts for the proposed SR 218 Corridor Study. An overview of the SR 218 project study area is shown in **Figure A.1**.

A.1 Development Conditions

This transportation impact analysis was based on the following development conditions:

Existing (2018) Conditions

Existing Conditions are represented by existing peak-hour traffic volumes on the existing roadway network. Traffic analysis is based on current traffic counts taken in 2018 as well as existing roadway geometry and traffic control.

Short-Term (2023) Conditions

Short-Term (2023) Conditions represents Year 2023 cumulative conditions, land use assumptions, and forecast traffic growth from the AMBAG Travel Demand Model. Traffic analysis is based on existing roadway geometry assuming no roadway and intersection improvements to the street network.

Short-Term (2023) Conditions with Improvements

No traffic analysis was conducted with the short-term improvements roadway geometry because the recommended improvements, while providing safety and multimodal access benefits, do not change factors that would change traffic operations.

Mid-Term (2028) Conditions

Mid-Term (2028) Conditions represents Year 2028 cumulative conditions, land use assumptions, and forecast traffic growth from the AMBAG Travel Demand Model. Traffic analysis is based on existing roadway geometry assuming no roadway and intersection improvements to the street network.

Mid-Term (2028) Conditions with Improvements

Mid-Term (2028) Conditions represents Year 2028 cumulative conditions, land use assumptions, and forecast traffic growth from the AMBAG Travel Demand Model. Traffic analysis is based on Mid-Term Conditions Traffic with the following improvements added: Harcourt Avenue Roundabout, Hilby Avenue Roundabout, Fremont Boulevard/Safeway Driveway intersection improvements, and the Sonoma Avenue to Fremont Boulevard Road Diet.

A.2 Criteria for Intersections

Analysis of potential environmental impacts at intersections are based on the concept of Level of Service (LOS). The LOS is a qualitative measure used to describe operational conditions. LOS ranges from A (best), which represents minimal delay, to F (worst), which represents heavy delay and a facility that is operating at or near its functional capacity. Levels of Service for this study were determined using methods defined in the Highway Capacity Manual 6 (HCM), Synchro 9 traffic analysis software, and Sidra Intersection 8.0 software.

HCM methodologies include procedures for analyzing side-street stop-controlled (SSSC), all-way stop-controlled (AWSC), signalized, and roundabout intersections. The SSSC procedure defines LOS as a function of average control delay for each minor street approach movement. Conversely, the AWSC, roundabout, and signalized intersection procedures define LOS as a function of average control delay for the overall intersection. **Table A.1** relates the operational characteristics associated with each LOS category for each intersection and roadway type analyzed in this study.

Table A.1 – Intersection Level of Service Definitions

Level of Service	Description	Signalized Average Control Delay (sec/vehicle)	Unsignalized[1] Average Control Delay (sec/vehicle)
A	Free flow with no delays. Users are virtually unaffected by others in the traffic stream	Equal or less than 10	Equal or less than 10
B	Stable traffic. Traffic flows smoothly with few delays.	10 to less than 20	10 to less than 15
C	Stable flow but the operation of individual users becomes affected by other vehicles. Modest delays.	20 to less than 35	15 to less than 25
D	Approaching unstable flow. Operation of individual users becomes significantly affected by other vehicles. Delays may be more than one cycle during peak hours.	35 to less than 55	25 to less than 35
E	Unstable flow with operating conditions at or near the capacity level. Long delays and vehicle queuing.	55 to less than 80	35 to less than 50
F	Forced or breakdown flow that causes reduced capacity. Stop and go traffic conditions. Excessive long delays and vehicle queuing.	Equal or more than 80	Equal or more than 50

[1] Unsignalized intersection include, side street stop-controlled, all-way stop-controlled, and roundabout controlled intersections
Source: Transportation Research Board, Highway Capacity Manual, 6th Edition, 2016, National Research Council

A.3 LOS Design Standards

The California Department of Transportation (Caltrans) has jurisdiction over all state highways and ramps. Caltrans endeavors to maintain a target level of service at the transition between LOS C and LOS D on state highway facilities; however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS.

The TAMC and Monterey County Regional Transportation Plan identifies a target LOS D standard for roadways and intersections within its Congestion Management Program network.

The City of Seaside currently has adopted LOS C as the level of service standard for signalized and unsignalized intersections. For intersections already operating at unacceptable LOS D, projects may increase the average delay up to 2.0 seconds without causing a significant impact. If the intersection is already operating at LOS E or F, projects may increase the average delay up to 1.0 seconds without causing a significant impact.

The City of Del Rey Oaks currently has adopted LOS C as the level of service standard for intersections or lower the level of service from 1995 level of service levels.

For the purposes of this analysis, a LOS C standard was applied for all study intersections within the project study area.

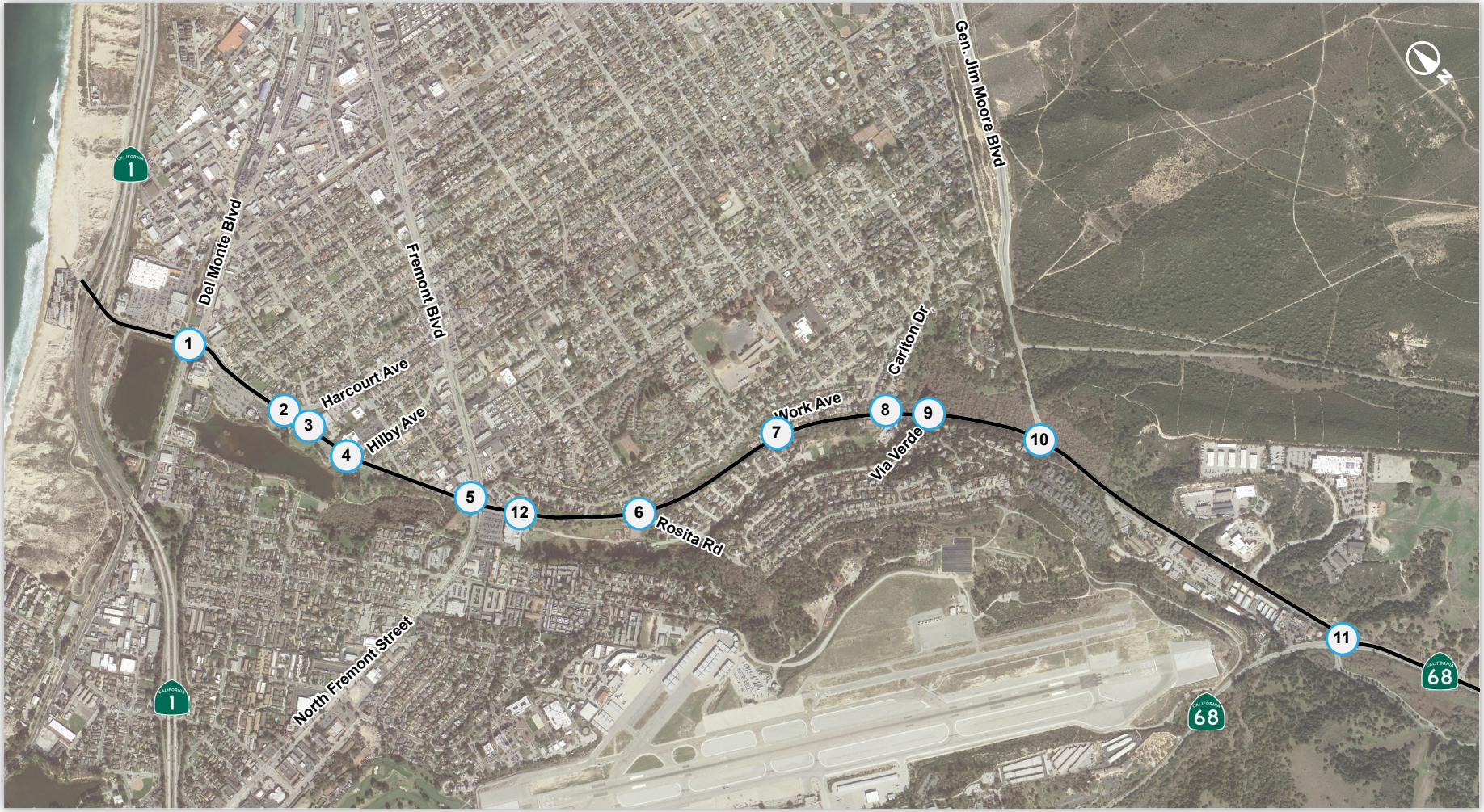
A.4 Study Area Intersections

The project will impact existing and future vehicular trips and travel patterns to the surrounding State Route 218 street network in Monterey County. To assess changes in traffic conditions associated with the project, the following intersections were analyzed based on Congestion Management Program criteria, knowledge of the area, engineering judgement, and consultation with TAMC staff.

1. State Route 218 & Del Monte Boulevard
2. State Route 218 & Harcourt Avenue (West Leg)/ Parking Lot
3. State Route 218 & Harcourt Avenue (East Leg)
4. State Route 218 & Hilby Avenue
5. State Route 218 & Fremont Boulevard
6. State Route 218 & Rosita Road
7. State Route 218 & Work Avenue
8. State Route 218 & Carlton Drive
9. State Route 218 & Via Verde
10. State Route 218 & General Jim Moore Boulevard
11. State Route 218 & State Route 68
12. State Route 218 & Safeway Driveway

Figure A.1 illustrates the location of the study intersection along the State Route 218 corridor.

Figure A.1 - Study Intersection Map



A.5 Level of Service (LOS) Impacts

Existing Roadway Network and Traffic Volumes

Below is a description of the principal roadways and highways within the project study area:

State Route 218 – Canyon Del Rey Boulevard

SR 218 is currently a four-lane minor arterial roadway between State Route 1 and Fremont Boulevard and a two-lane minor arterial roadway between Fremont Boulevard and State Route 68. This 2.8-mile segment of roadway forms an important connection between SR 1 and SR 68 for local and-regional access in Monterey Bay Peninsula.

State Route 1

State Route 1 is a north-south four-lane freeway that provides regional access between the Monterey / Santa Cruz County line, and the Monterey / San Luis Obispo County line. It provides access to SR 218 via a grade separated interchange in Seaside.

Del Monte Boulevard

Del Monte Boulevard is a four-lane, north-south major arterial road that provides local access to the Monterey Peninsula Region. Del Monte Boulevard serves nearly as many cars as Highway 1 in the study area and is Downtown Monterey, Cannery Row and the City of Pacific Grove.

Fremont Boulevard

Fremont Boulevard is a north-south, four-lane major arterial that provides local access between the cities of Monterey, Seaside and Del Rey Oaks and regional access though State Route 1, State Route 68 and State Route 218.

State Route 68

SR 68 (Monterey-Salinas Highway) is an east-west, two-lane highway that provides local access between the Monterey Peninsula and Salinas. It connects with SR 218 via a signalized intersection at the eastern terminus of State Route 68.

Existing Conditions Traffic Volumes

Weekday turning movement volumes for the existing study intersections, were collected in 2018 during the months of March to September. These counts included vehicles, bicycles, and pedestrians. Volumes for intersections were collected during the AM and PM peak periods of 7:00-9:00 AM and 4:00-6:00 PM. These traffic counts were taken when local schools were in session and the weather was fair.

Existing lane geometry and AM and PM peak hour intersection volumes are shown in **Figure A.2** And **Figure A.3** respectively. Intersection volume data sheets for all traffic counts are provided in **Appendix B**.

For Existing Conditions, the intersection peak hour factor, was determined from the collected traffic counts. For analysis of SR 218, an 2% truck / heavy vehicle usage was assumed. Pedestrian and Bicycle count data was incorporated into the HCM intersection analysis.

Figure A.2 - Existing Conditions Geometry

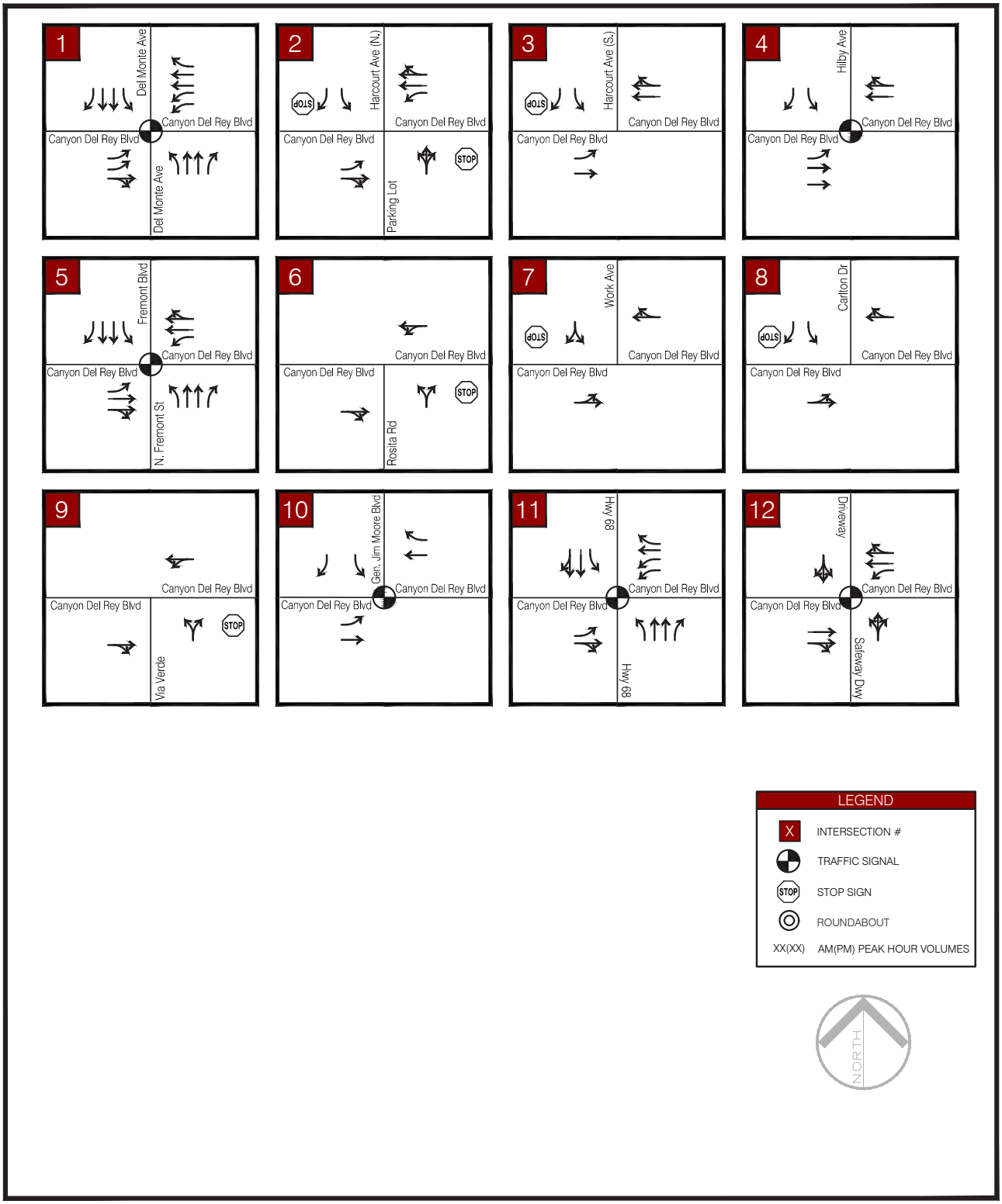
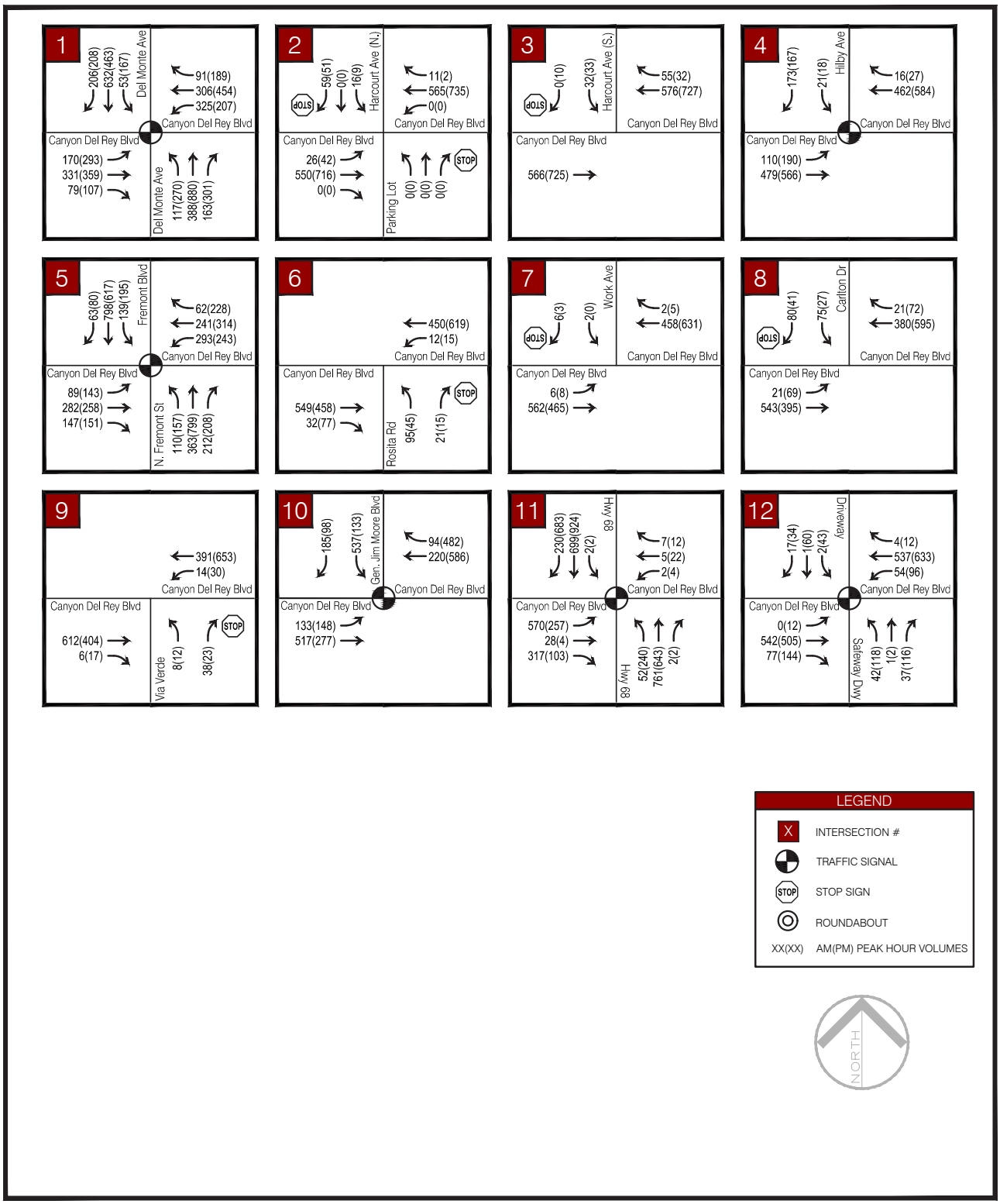


Figure A.3 - Existing Conditions Traffic Volumes



Existing Intersection LOS

Traffic operations were evaluated at the study intersections based on Existing Conditions lane geometry, traffic control, and peak hour traffic volumes. The following intersections operate at unacceptable LOS under Existing Conditions:

- State Route 218 & Harcourt Avenue (East Leg) (Intersection #3) (AM & PM Peak)
- State Route 218 & Rosita Road (Intersection #6) (AM Peak)
- State Route 218 & Safeway Driveway (Intersection #12) (PM Peak)

Results of the analysis are presented in **Table A.2** and Synchro output sheets are provided in **Appendix A.1**. As shown in **Table A.2** the existing side street stop-controlled intersections along State Route 218 are operating at LOS D or below due to limited gap opportunities for stopped vehicles to access the highway.

Table A.2 – Existing Conditions Intersection Level of Service

#	Intersection	Control		AM Peak		PM Peak	
				Delay	LOS	Delay	LOS
1	SR 218 & Del Monte Blvd	Signal	Overall	23.7	C	30.4	C
2	SR 218 & Harcourt Ave (West Leg)/ Parking Lot	SSSC	Overall	1.2	-	1.0	-
			Worst Approach	17.0	C (SB)	18.8	C (SB)
3	SR 218 & Harcourt Ave (East Leg)	SSSC	Overall	0.9	-	1.1	-
			Worst Approach	**33.5**	**D (SB)**	**39.1**	**E (SB)**
4	SR 218 & Hilby Ave	Signal	Overall	8.8	A	9.0	A
5	SR 218 & Fremont Blvd	Signal	Overall	31.0	C	32.4	C
6	SR 218 & Rosita Rd	SSSC	Overall	3.0	-	1.3	-
			Worst Approach	**29.1**	**D (NB)**	24.7	C (NB)
7	SR 218 & Work Ave	SSSC	Overall	0.2	-	0.1	-
			Worst Approach	13.4	B (SB)	12.8	B (SB)
8	SR 218 & Carlton Dr	SSSC	Overall	2.6	-	1.6	-
			Worst Approach	17.6	C (SB)	19.0	C (SB)
9	SR 218 & Via Verde	SSSC	Overall	0.8	-	0.7	-
			Worst Approach	15.1	C (NB)	16.4	C (NB)
10	SR 218 & Gen. Jim Moore Blvd	Signal	Overall	15.0	B	13.4	B
11	SR 218 & SR 68	Signal	Overall	24.8	C	25.3	C
12	SR 218 & Safeway Dwy	SSSC	Overall	2.3	-	22.6	-
			Worst Approach	13.4	B (NB)	**154.4**	**F (NB)**

Notes:
1. Analysis performed using HCM 6 methodologies
2. The average overall control delay is reported for signalized and all-way stop-controlled (AWSC) intersections. The delay for the worst movement is reported for side-street stop-controlled (SSSC) intersections
3. Delay indicated in seconds/vehicle.
4. Intersections that fall below Caltrans standard are highlighted/bolded

A.6 Short-Term (2023) Conditions

Short-Term Roadway Network and Traffic Volumes

The Association of Monterey Bay Area Governments (AMBAG) is the designated Metropolitan Planning Organization for Monterey, San Benito, and Santa Cruz Counties. AMBAG is the agency responsible for developing and maintaining a traffic model for air quality purposes as required by the Clean Air Act Amendment of 1990. To this end, AMBAG developed a travel demand model to forecast vehicle travel demand from future land use and population assumptions.

Year 2035 AM and PM peak hour traffic volumes for the study area were determined from the AMBAG model. To determine Short-Term (2023) Conditions, growth between Existing (2018) and Year 2035 was interpolated. Traffic volumes for Short-Term (2023) Conditions were also adjusted for volume balancing to ensure consistency between adjacent intersections.

For Short-Term (2023) Conditions, the intersection peak hour factor, heavy vehicle, pedestrian volumes and bicycle volumes were assumed to be the same as existing conditions. Study were analyzed with Existing Condition lane geometry and traffic control to simulate traffic growth with no network improvements for the Short-Term (2023) Conditions. Proposed Short-Term improvements are primarily striping or sidewalk which would not affect the HCM analysis.

Short-Term (2023) Conditions for the AM and PM peak hour are shown in **Figure A.4**.

Short-Term Intersection LOS

Traffic operations were evaluated at the study intersections based on Existing Conditions lane geometry, traffic control, and Short-Term peak hour traffic volumes. The following intersections operate at unacceptable LOS under Short-Term Conditions:

- State Route 218 & Harcourt Avenue (East Leg) (Intersection #3) (AM & PM Peak)
- State Route 218 & Rosita Rd (Intersection #6) (AM Peak)
- State Route 218 & Safeway Driveway (Intersection #12) (AM & PM Peak)

Results of the analysis are presented in **Table A.3** and Synchro output sheets are provided in **Appendix A.2** As shown in **Table A.3** the existing side street stop-controlled intersections along SR 218 are operating at LOS D or below due to limited gap opportunities for stopped vehicles to access the highway.

Figure A.4 – Short-Term (2023) Conditions Traffic Volumes

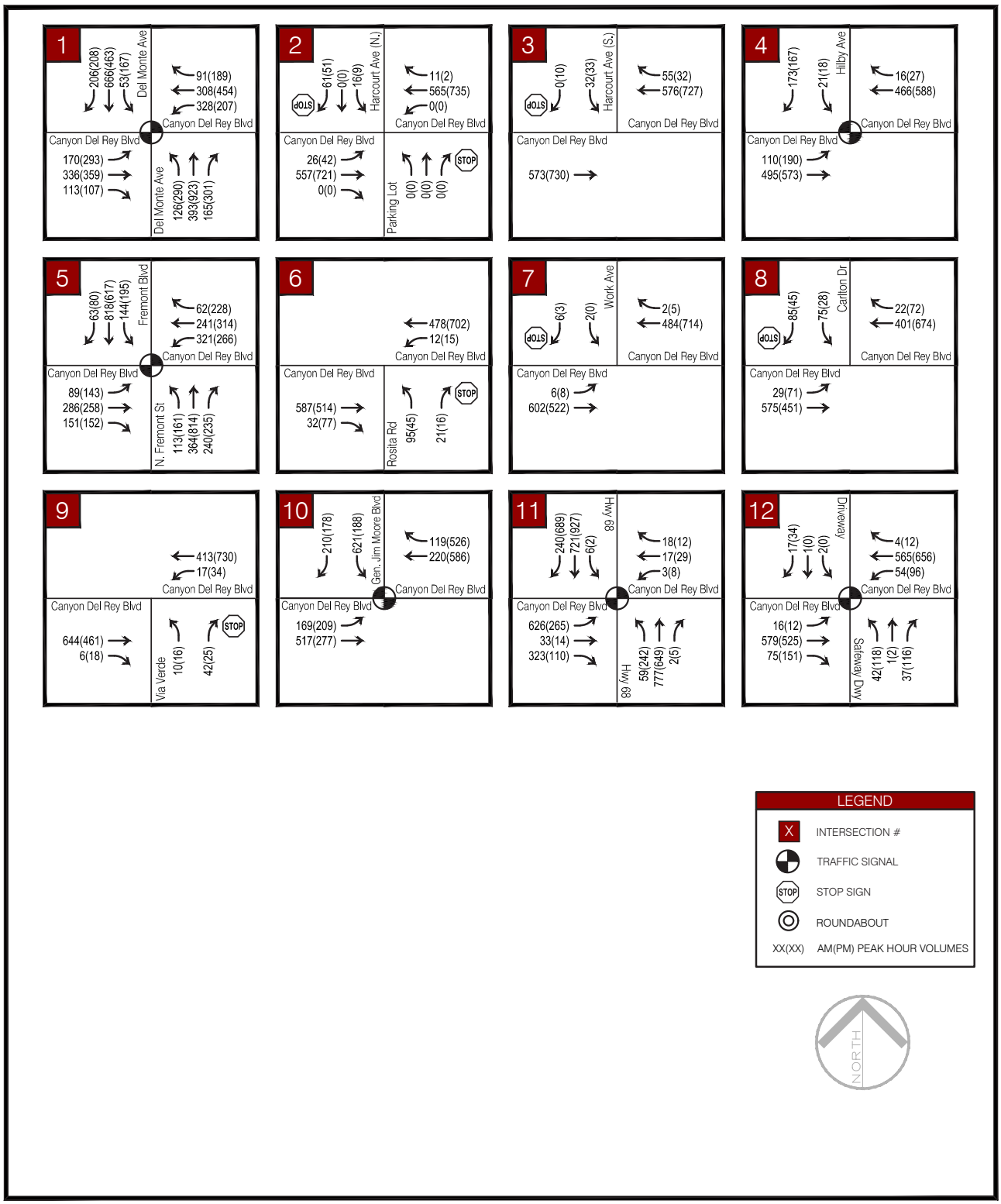


Table A.3 – Short-Term (2023) Conditions Intersection Level of Service

#	Intersection	Control		AM Peak		PM Peak	
				Delay	LOS	Delay	LOS
1	SR 218 & Del Monte Blvd	Signal	Overall	24.5	C	32.4	C
2	SR 218 & Harcourt Ave (West Leg)/ Parking Lot	SSSC	Overall	1.3	-	1.0	-
			Worst Approach	17.1	C (SB)	18.8	C (SB)
3	SR 218 & Harcourt Ave (East Leg)	SSSC	Overall	0.9	-	1.1	-
			Worst Approach	**33.9**	**D (SB)**	**39.5**	**E (SB)**
4	SR 218 & Hilby Ave	Signal	Overall	8.4	A	9.0	A
5	SR 218 & Fremont Blvd	Signal	Overall	34.0	C	34.3	C
6	SR 218 & Rosita Rd	SSSC	Overall	3.2	-	1.5	-
			Worst Approach	**33.4**	**D (NB)**	30.3	C (NB)
7	SR 218 & Work Ave	SSSC	Overall	0.2	-	0.1	-
			Worst Approach	14.0	B (SB)	13.8	B (SB)
8	SR 218 & Carlton Dr	SSSC	Overall	2.8	-	1.7	-
			Worst Approach	19.0	C (SB)	22.2	C (SB)
9	SR 218 & Via Verde	SSSC	Overall	0.9	-	0.9	-
			Worst Approach	16.2	C (NB)	20.2	C (NB)
10	SR 218 & Gen. Jim Moore Blvd	Signal	Overall	17.4	B	15.7	B
11	SR 218 & SR 68	Signal	Overall	28.2	C	26.6	C
12	SR 218 & Safeway Dwy	SSSC	Overall	2.4	-	26.1	-
			Worst Approach	**31.3**	**D (NB)**	**184.3**	**F (NB)**

Notes:
1. Analysis performed using HCM 6 methodologies
2. The average overall control delay is reported for signalized and all-way stop-controlled (AWSC) intersections. The delay for the worst movement is reported for side-street stop-controlled (SSSC) intersections
3. Delay indicated in seconds/vehicle.
4. Intersections that fall below Caltrans standard are highlighted/bolded

A.7 Mid-Term (2028) Conditions

Mid-Term Roadway Network and Traffic Volumes

Similar to the Short-Term Conditions, Mid-Term (2028) Conditions are based on the AMBAG travel demand model and growth between Existing and Year 2035 volumes were interpolated. Traffic volumes for Mid-Term (2028) Conditions were also adjusted for volume balancing to ensure consistency between adjacent intersections.

For Mid-Term (2028) Conditions, the intersection peak hour factor, heavy vehicle percentages, pedestrian volumes and bicycle volumes were assumed to be the same as existing conditions. Studies were analyzed with Existing Condition lane geometry and traffic control to simulate traffic network operations for the Mid-Term (2028) Conditions. Proposed Short-Term improvements, that may be in place for Mid-Term Conditions, are primarily striping or sidewalk which would not affect the HCM analysis.

Mid-Term (2028) Conditions for the AM and PM peak hour are shown in **Figure A.5**.

Mid-Term Intersection LOS

Traffic operations were evaluated at the study intersections based on Existing Conditions lane geometry, traffic control, and Mid-Term peak hour traffic volumes. The following intersections operate at unacceptable LOS under Mid-Term Conditions:

- State Route 218 & Del Monte Boulevard (Intersection #1) (PM Peak)
- State Route 218 & Harcourt Avenue (East Leg) (Intersection #3) (AM & PM Peak)
- State Route 218 & Fremont Boulevard (Intersection #5) (AM & PM Peak)
- State Route 218 & Rosita Rd (Intersection #6) (AM & PM Peak)
- State Route 218 & Safeway Driveway (Intersection #12) (AM & PM Peak)

Results of the analysis are presented in **Table A.4** and Synchro output sheets are provided in **Appendix A.3** As shown in **Table A.2** the existing side street stop-controlled intersections along State Route 218 are operating at LOS D or below due to limited gap opportunities for stopped vehicles to access the highway.

Figure A.5 - Mid-Term (2028) Conditions Traffic Volumes

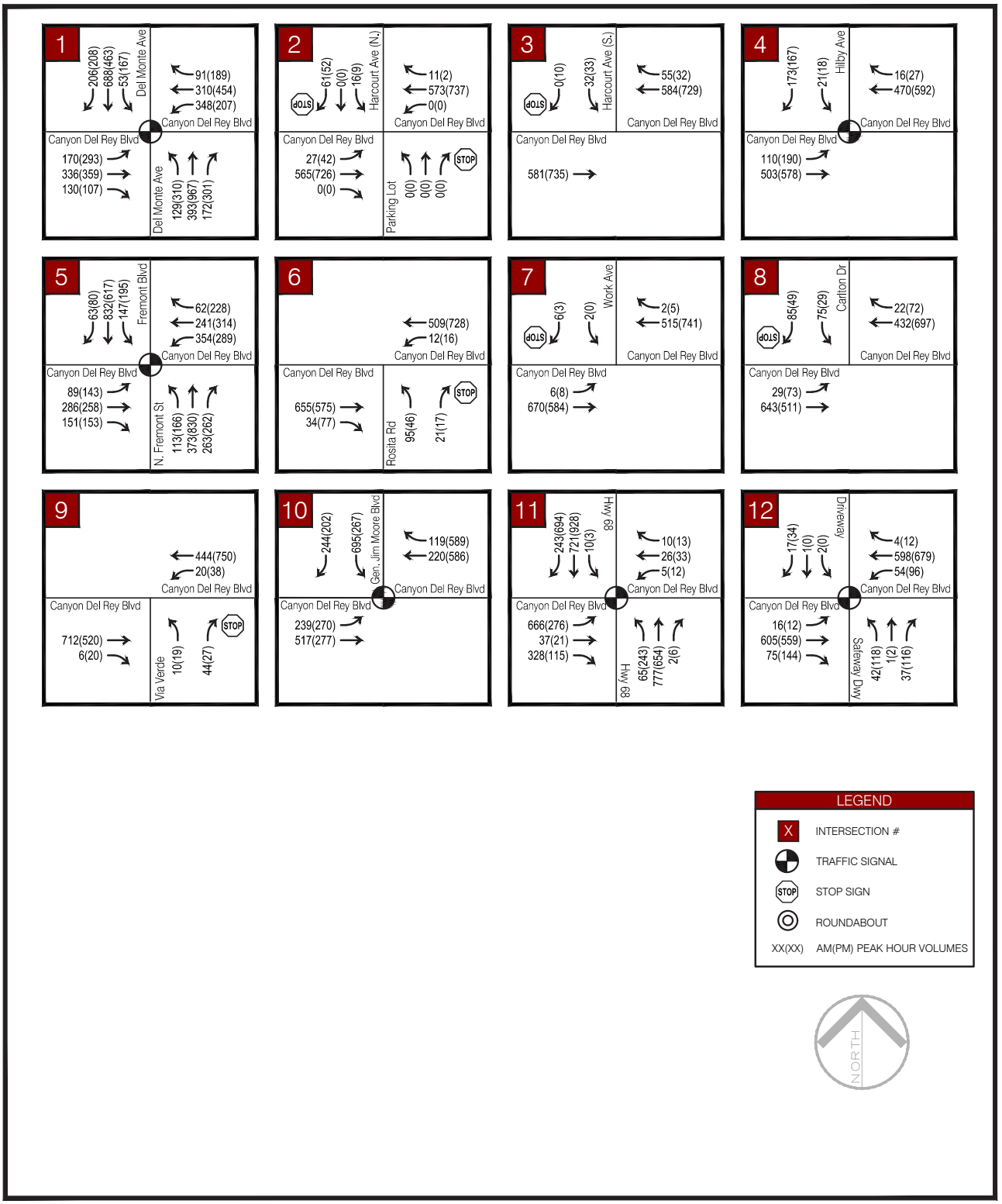


Table A.4 – Mid-Term (2028) Conditions Intersection Level of Service

#	Intersection	Control		AM Peak		PM Peak	
				Delay	LOS	Delay	LOS
1	SR 218 & Del Monte Blvd	Signal	Overall	25.2	C	**35.3**	**D**
2	SR 218 & Harcourt Ave (West Leg)/ Parking Lot	SSSC	Overall	1.3	-	1.0	-
			Worst Approach	17.4	C (SB)	18.9	C (SB)
3	SR 218 & Harcourt Ave (East Leg)	SSSC	Overall	0.9	-	1.1	-
			Worst Approach	**33.9**	**D (SB)**	**40.3**	**E (SB)**
4	SR 218 & Hilby Ave	Signal	Overall	8.4	A	9.0	A
5	SR 218 & Fremont Blvd	Signal	Overall	**38.6**	**D**	**36.6**	**D**
6	SR 218 & Rosita Rd	SSSC	Overall	3.8	-	1.5	-
			Worst Approach	**42.3**	**D (NB)**	**35.9**	**E (NB)**
7	SR 218 & Work Ave	SSSC	Overall	0.2	-	0.1	-
			Worst Approach	14.8	B (SB)	14.1	B (SB)
8	SR 218 & Carlton Dr	SSSC	Overall	2.9	-	1.8	-
			Worst Approach	21.7	C (SB)	24.7	C (SB)
9	SR 218 & Via Verde	SSSC	Overall	0.9	-	1.0	-
			Worst Approach	17.9	C (NB)	23.9	C (NB)
10	SR 218 & Gen. Jim Moore Blvd	Signal	Overall	23.8	B	23.6	C
11	SR 218 & SR 68	Signal	Overall	29.0	C	27.5	C
12	SR 218 & Safeway Dwy	SSSC	Overall	2.6	-	30.5	-
			Worst Approach	**34.4**	**D (NB)**	**223.1**	**F (NB)**

Notes:
1. Analysis performed using HCM 6 methodologies
2. The average overall control delay is reported for signalized and all-way stop-controlled (AWSC) intersections. The delay for the worst movement is reported for side-street stop-controlled (SSSC) intersections
3. Delay indicated in seconds/vehicle.
4. Intersections that fall below Caltrans standard are highlighted/bolded
5. Intersections 5 and 12 were updated to reflect the Caltrans model revisions

A.8 Mid-Term (2028) Conditions with Improvements

Mid-Term Conditions with Improvements Roadway Network and Traffic Volumes

The Mid-Term (2028) Conditions with Improvement Scenario uses same assumptions as the Mid-Term (2028) Conditions without Improvements for the peak hour traffic volumes, the intersection peak hour factor, heavy vehicle percentages, pedestrian volumes and bicycle volumes were assumed to be the same as existing conditions.

The following improvements were incorporated into the transportation network for corridor analysis:

- Canyon Del Rey Boulevard Road Diet, from Sonoma Ave to Fremont Boulevard
- Harcourt Avenue Roundabout
- Hilby Avenue Roundabout
- Fremont Boulevard/ Safeway Driveway Intersection Improvements

Proposed concept design layouts can be seen in **Appendix G**. Several proposed improvements such as the addition of sidewalk or implementation of the Del Monte Boulevard Protected Intersection would impact HCM Level of Service analysis and cannot be reflected in Synchro or SimTraffic modeling. The proposed improvements to the intersection of State Route 218 and State Route 68 has been studied independently in the Highway 68 Scenic Highway Plan and not included in the improvement section. It should be noted that the Hilby Avenue Roundabout is no longer the preferred alternative for the Mid-Term improvements, the level of service is still presented for comparison improvement Level of Service can be substituted, the roundabout will however impact corridor analysis the addition of a roundabout may slow the speed of through traffic.

Other roundabout improvements studied but not incorporated into the corridor analysis include:

- Rosita Road Roundabout
- Carlton Drive Roundabout
- Via Verde Roundabout

Mid-Term with Improvements Intersection LOS

Traffic operations were evaluated at the study intersections based on Existing Conditions lane geometry, traffic control, and Mid-Term peak hour traffic volumes. The following intersections operate at unacceptable LOS under Mid-Term Conditions:

- State Route 218 & Del Monte Boulevard (Intersection #1) (PM Peak)
- State Route 218 & Harcourt Avenue (East Leg) (Intersection #3) (AM & PM Peak)
- State Route 218 & Fremont Boulevard (Intersection #5) (AM & PM Peak)
- State Route 218 & Rosita Rd (Intersection #6) (AM & PM Peak)
- State Route 218 & Safeway Driveway (Intersection #12) (AM & PM Peak)

Results of the analysis are presented in **Table A.5** and Synchro and Sidra output sheets are provided in **Appendix A.4**. As shown in **Table A.4** the mid-term conditions without improvements side street stop-controlled intersections along SR 218 are operating at LOS D or below due to limited gap opportunities for stopped vehicles to access the highway.

Table A.5 – Mid-Term (2028) Conditions with Improvements Intersection Level of Service

#	Intersection	Control		AM Peak		PM Peak	
				Delay	LOS	Delay	LOS
1	SR 218 & Del Monte Blvd	Signal	Overall	25.3	C	**36.1**	**D**
2	SR 218 & Harcourt Ave	RAB	Overall	8.1	A	10.1	B
5	SR 218 & Fremont Blvd	Signal	Overall	**40.8**	**D**	**37.4**	**D**
10	SR 218 & Gen. Jim Moore Blvd	Signal	Overall	24.9	C	28.9	C
12	SR 218 & Safeway Dwy	SSSC	Overall	2.4	-	21.7	-
			Worst Approach	**31.9**	**D (NB)**	**156.5**	**F (NB)**

Notes:
1. Analysis performed using HCM 6 methodologies
2. The average overall control delay is reported for signalized, all-way stop-controlled (AWSC) intersections, and roundabout (RAB) intersections. The delay for the worst movement is reported for side-street stop-controlled (SSSC) intersections
3. Delay indicated in seconds/vehicle.
4. Intersections that fall below Caltrans standard are highlighted/bolded.
5. Intersections 5 and 12 were updated to reflect the Caltrans model revisions

The following table summarizes the findings of proposed roundabout improvements at three unsignalized intersections along State Route 218. The intersection level of service was studied but not incorporated into the corridor analysis as they require further feasibility studies due to topography and right of way impacts. **Table A.6** summarizes the intersection level of service for potential roundabout alternatives.

Table A.6 – Other Roundabout Alternatives Intersection Level of Service

#	Intersection	Control		AM Peak		PM Peak	
				Delay	LOS	Delay	LOS
4	SR 218 & Hilby Ave	RAB	Overall	7.8	A	9.8	A
6	SR 218 & Rosita Rd	RAB	Overall	7.9	A	8.8	A
8	SR 218 & Carlton Dr	RAB	Overall	7.7	A	9.5	A
9	SR 218 & Via Verde	RAB	Overall	7.8	A	9.0	A

Notes:
1. Analysis performed using HCM 6 methodologies
2. The average overall control delay is reported for signalized, all-way stop-controlled (AWSC) intersections, and roundabout (RAB) intersections. The delay for the worst movement is reported for side-street stop-controlled (SSSC) intersections,
3. Delay indicated in seconds/vehicle.
4. Intersections that fall below Caltrans standard are highlighted/bolded

SR 218 and Fremont Boulevard Intersection

Several alternatives were evaluated for the intersection of SR 218 and Fremont Boulevard, which includes the Safeway driveway immediately east of the intersection. The primary reason for the proposed change at the proposed FORTAG trail along the Safeway frontage. Alternatives considered for accommodating the FORTAG trail from the westside of the SR 218/ Fremont Boulevard past Safeway requires widening of the sidewalk area along the Safeway frontage. Traffic analysis included an evaluation of several geometric lane change and lane drop options. The Safeway driveway is also busy and poses several challenges for both entering and exiting traffic. Additionally, there are business driveways on the north side of SR 218 in the subject area.

Of the various alternatives, five were presented to Caltrans. These alternatives varied in lane configuration, bicycle facilities, and sidewalk configuration. It should be noted that when comparing alternatives, due to the limitations of traffic analysis software, not all of the complexities could be incorporated. The various driveways leading up to the intersection includes a left turn lane that extends into a two-way left turn lane that provides access to four driveways, including the Safeway Driveway. The two-way left turn lane is used as an extended left turn lane storage for westbound traffic in peak periods. A bus stop is located in the eastbound curb lane between Fremont Boulevard and the Safeway

Driveway. This bus stop serves three buses in the peak hours. A short merge area is provided just east of the Safeway Driveway. Bike lanes are provided just east of the last driveway, but no transition to the intersection is provided.

Alternatives were also discussed at community meetings. It included the potential closure of the Safeway Driveway on SR 218, the conversion from a full access driveway to right in, right out only, and the relocation of the driveway to a road behind Safeway. The community provided over 25 comments on just the segment of road between Fremont Boulevard and Safeway. All of these suggestions could potentially improve the congestion and confusion around this intersection, however there are several drawbacks. The closure or conversion of the driveway would limit the right-of-way and access of Safeway. This would result in approximately half of the vehicles exiting the Safeway driveway to take a longer more circuitous route. As U-turns are prohibited at the intersection with SR-218, the closure or conversion of the driveway would also likely result in neighborhood cut-through traffic of vehicles trying to return to Fremont Boulevard. The relocation of the delivery access to behind Safeway, would provide improved spacing from the intersection, as well as, separate heavy vehicle entrance. The relocation of the driveway would be difficult to implement as it requires the reconstruction of the Safeway building and change to their delivery access.

Three alternatives were focused on by Caltrans: the No Project alternative, Alternative 2 and Alternative 5. The preferred alternative for Caltrans is No Project, meaning no geometric changes to the existing roadway. Alternative 5 was considered to have minimal vehicle operational impact to the intersections, and Alternative 2 was not considered to have vehicle operational benefits. The conclusions were based on the Caltrans performance report in **Appendix A.5**, which focus on network delay and queueing. These conclusions also do not factor in any pedestrian or bicycle operations which cannot be accounted for in the transportation model software utilized. Alternatives 2 and 5 are described in the following paragraph.

Alternative 2

Alternative 2 includes the conversion of the eastbound and westbound from shared through-right lane to a right turn lane at the Fremont Boulevard intersection, the center through lane will remain. The conversion from shared through-right turn lanes to a right turn only lane is to provide most efficient transition to the recommended road diet between Fremont Boulevard and Sonoma Avenue. The road diet and turn lanes would provide sufficient right of way accommodate the proposed bicycle and pedestrian improvements. At the Safeway Driveway the eastbound shared though -right lane would be converted to a right turn pocket for the Safeway Driveway. The benefits of this conversion are that is helps to organize traffic, it eliminates the need for a merge area, it reduces the conflicts for vehicles exiting the Safeway driveway and accommodates areas for increased bicycle and pedestrian facilities. The conceptual layout for Alternative 2 can be found in Appendix A.5.

Alternative 5

Alternative 5, similar to Alternative 2, includes the conversion of the eastbound and westbound from shared through-right lane to a right turn only lane at the Safeway Driveway. To accommodate the widened sidewalk Alternative 5 proposes the relocation and shortening of the merge area. The shortening of the merge area was needed to provide adequate space to meet the Caltrans standard for a Class I facility which would connect to the existing bike lane and future FORTAG connection. The conceptual layout for Alternative 2 can be found in Appendix A.5.

Table A.7 shows the Level of Service for the intersection alternatives.

Table A.7 – SR 218 and Fremont Boulevard Level of Service Alternative Comparison

#	Intersection	Control		AM Peak		PM Peak	
				Delay	LOS	Delay	LOS
Mid-Term No Project							
5	SR 218 & Fremont Blvd	Signal	Overall	**38.6**	**D**	**36.6**	**D**
12	SR 218 & Safeway Dwy	SSSC	Overall	2.6	-	30.5	-
			Worst Approach	**34.4**	**D (NB)**	**223.1**	**F (NB)**
Mid-Term, Alternative 2							
5	SR 218 & Fremont Blvd	Signal	Overall	**40.8**	**D**	**37.4**	**D**
12	SR 218 & Safeway Dwy	SSSC	Overall	2.4	-	21.7	-
			Worst Approach	**31.9**	**D (NB)**	**156.5**	**F (NB)**
Mid-Term, Alternative 5							
5	SR 218 & Fremont Blvd	Signal	Overall	**40.8**	**D**	**37.3**	**D**
12	SR 218 & Safeway Dwy	SSSC	Overall	2.4	-	21.7	-
			Worst Approach	**34.4**	**D (NB)**	**223.1**	**F (NB)**

Notes:
1. Analysis performed using HCM 6 methodologies
2. The average overall control delay is reported for signalized, all-way stop-controlled (AWSC) intersections, and roundabout (RAB) intersections. The delay for the worst movement is reported for side-street stop-controlled (SSSC) intersections,
3. Delay indicated in seconds/vehicle.
4. Intersections that fall below Caltrans standard are highlighted/bolded
5. Source: Caltrans, 2018.

Table A.8 shows the comparison in alternatives for queueing results, the 95th percentile queue which is often used as an indication of required turn pocket length. The two alternatives presented for consideration are indicated in the table. In the AM peak hour, both alternatives indicate similar vehicle queue length, with an increase of less than one vehicle in all but one movement with the recommended improvements. In the PM, more approaches have an increase in queue length of greater than one vehicle (~25 feet). While the 95th percentile queue at the exit approach of the Safeway driveway (Intersection 5 northbound) increases by 4 vehicle lengths, the overall delay decreases, (shown in **Table A.7**) which means improved operations for SR 218.

Table A.8- SR 218 and Fremont Boulevard Queueing Alternative Comparison

#	Intersection	MVMT	Turn Pocket Length (feet)	Mid-Term Conditions		Mid-Term Conditions with Alternative		Change in Queue Length	
				AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Mid-Term, Alternative 2									
5	SR 218 & Fremont Blvd	EBL	150	133	**151**	143	**232**	+10 (<1 veh)	+80 (3 veh)
		EBT/R4	150	**168**	**167**	**174**	**219**	+8 (<1 veh)	+52 (2 veh)
		WBL	150	**222**	**213**	**232**	**175**	+10 (<1 veh)	-38 (2 veh)
		WBT/R[4]	-	138	209	148	169	+10 (<1 veh)	-40 (2 veh)
		NBL	250	115	**273**	127	**258**	+12 (<1 veh)	-26 (1 veh)
		NBR	450	91	154	148	151	+57 (2 veh)	-3 (<1 veh)
		SBL	200	**235**	**221**	**246**	**242**	+11 (<1 veh)	+21 (1 veh)
		SBR	250	152	78	182	105	+30 (1 veh)	+27 (1 veh)
12	SR 218 & Safeway Dwy	EBL	25	26	25	**28**	**24**	+2 (<1 veh)	-1 (<1 veh)
		EBT/R[4]	115	5	11	6	20	+2 (<1 veh)	+9 (<1 veh)
		WBL	150	43	59	47	60	+4 (<1 veh)	+1 (<1 veh)
		NBL/T/R	-	84	347	84	445	-	+98 (4 veh)
		SBL/T/R	-	40	51	41	57	+1 (<1 veh)	+6 (<1 veh)
Mid-Term, Alternative 5									
5	SR 218 & Fremont Blvd	EBL	150	133	**151**	142	**170**	+9 (<1 veh)	+19 (<1 veh)
		EBT/R4	150	**168**	**167**	**163**	**157**	-5 (<1 veh)	-10 (<1 veh)
		WBL	150	**222**	**213**	**227**	**226**	+5 (<1 veh)	+13 (<1 veh)
		WBT/R[4]	-	138	209	121	207	-17 (<1 veh)	-2 (<1 veh)
		NBL	250	115	**273**	132	**267**	+17 (<1 veh)	-6 (<1 veh)
		NBR	450	91	154	108	132	+17 (<1 veh)	-18 (<1 veh)
		SBL	200	**235**	**221**	**253**	**222**	+18 (<1 veh)	+1 (<1 veh)
		SBR	250	152	78	130	85	-22 (<1 veh)	+8 (<1 veh)
12	SR 218 & Safeway Dwy	EBL	25	**26**	25	**26**	**60**	-	+35 (1 veh)
		EBT/R	115	5	11	22	74	+17 (<1 veh)	+63 (3 veh)
		WBL	150	43	59	47	25	+4 (<1 veh)	-34 (1 veh)
		NBL/T/R	-	84	347	74	388	-10 (<1 veh)	+41 (2 veh)
		SBL/T/R	-	40	51	40	53	+1 (<1 veh)	+2 (<1 veh)

Notes:
1. Roundabout queue lengths calculated using Sidra 8.0, Signalized and SSSC intersection queue lengths were determined using SimTraffic 10 analysis and utilize 10 model runs.
2. Queue Lengths that exceed turn pocket lengths are highlighted/bolded
3. Turn Pocket Lengths with "– "are do not have turn pockets and instead run the length of the roadway segment.
4. Transitions to a right turn lane in with the proposed Alternative.

Source: Caltrans, 2018

A.9 Intersection Queueing

Queuing at study intersections was evaluated to determine the potential impact of improvements to corridor operations. Intersection level of service is only one component of traffic operations. Studying queueing can provide an alternative viewpoint of corridor congestion that is directly related to driver frustration and driving experience. The 95th percentile queue is used for the evaluation of queueing on a corridor and can help determine turn pocket lengths. SimTraffic 10 and Sidra Intersection 8.0 were used to determine queue lengths in the corridor. SimTraffic Simulation Outputs including intersection queueing can be found in **Appendix A.6**.

Mid-Term (2028) Conditions with and without Improvements

Queueing at intersections was studied in order to better understand the impact of proposed improvements to intersection queues in the Mid-Term Conditions. The Mid-Term Conditions have the highest traffic volumes and represent the worst-case traffic volumes. **Table A.9** provides a summary of queue lengths for study intersections.

Some intersections experience an increase in the 95th percentile queue as a result of the proposed improvements. It should be noted that the primary purpose of some improvements is for the integration of bicycle and pedestrian access and safety for all modes and the increase in queues can be expected. However, the increase in queues are minimal or negligible at busy intersections and longer queues will occur at intersections that operate at acceptable conditions.

The following intersections have an increase in one or more vehicles in the AM or PM Peak hour that extend beyond the turn pocket lengths as a result of the improvements along the corridor:

- State Route 218 & Del Monte Boulevard (Intersection #1)
- State Route 218 & Harcourt Ave (Intersection #2/3)
- State Route 218 & Hilby Ave (Intersection #4)
- State Route 218 & Fremont Blvd (Intersection #5)
- State Route 218 & Rosita Rd (Intersection #6)
- State Route 218 & Safeway Driveway (Intersection #12)

Table A.9 – Mid-Term (2028) Conditions with and without Improvement Queue Lengths

#	Intersection	MVMT	Turn Pocket Length (feet)	Mid-Term Conditions		Mid-Term Conditions with Improvements		Change in Queue Length	
				AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
1	SR 218 & Del Monte Blvd	EBL	230	120	230	109	**252**	-11 (<1 veh)	+22 (<1 veh)
		EBL2	230	178	**241**	188	**267**	+10 (<1 veh)	+26 (1 veh)
		WBL	215	170	106	164	118	-6 (<1 veh)	+12 (<1 veh)
		WBL	215	180	129	171	133	-9 (<1 veh)	+4 (<1 veh)
		WBR	100	68	**147**	60	**141**	-8 (<1 veh)	-6 (<1 veh)
		NBL	200	144	**232**	151	**232**	+7 (<1 veh)	0
		NBR	200	93	**292**	74	**294**	-19 (<1 veh)	+2 (<1 veh)
		SBL	120	**150**	**170**	**129**	**169**	-21 (<1 veh)	-1 (<1 veh)
		SBR	50	**96**	**95**	**97**	**94**	+1 (<1 veh)	-1 (<1 veh)
2[4]	SR 218 & Harcourt Ave (West Leg)/ Parking Lot	EBL	-	36	48	104	153	+68 (3 veh)	+105 (4 veh)
		SBL	-	14	9	18	18	-48 (2 veh)	-49 (2 veh)
		SBR	-	12	16				
3[4]	SR 218 & Harcourt Ave (East Leg)	SBL	-	40	42				
4[5]	SR 218 & Hilby Ave	EBL	60	**76**	**91**	**76**	**91**	0	0
		SBL	75	21	21	21	21	0	0
5	SR 218 & Fremont Blvd	EBL	150	133	**151**	143	**232**	+10 (<1 veh)	+80 (3 veh)
		EBR	150	168	167	174	**219**	+8 (<1 veh)	+52 (2 veh)
		WBL	150	**222**	**213**	232	**175**	+10 (<1 veh)	-38 (2 veh)
		WBR	-	138	209	148	169	+10 (<1 veh)	-40 (2 veh)
		NBL	250	115	**273**	127	**258**	+12 (<1 veh)	-26 (1 veh)
		NBR	450	91	154	148	151	+57 (2 veh)	-3 (<1 veh)
		SBL	200	**235**	**221**	**246**	**242**	+11 (<1 veh)	+21 (1 veh)
		SBR	250	152	78	182	105	+30 (1 veh)	+27 (1 veh)
6	SR 218 & Rosita Rd	NBL/R	-	41	66	98	71	+57 (2 veh)	+5 (<1 veh)
7	SR 218 & Work Ave	SBL/R	-	29	17	30	18	+1 (<1 veh)	+1 (<1 veh)
8	SR 218 & Carlton Dr	EBL/T	-	80	211	73	209	-7 (<1 veh)	-3 (<1 veh)
		WBR	100	4	9	0	12	-4 (<1 veh)	+4 (<1 veh)
		SBL	-	77	55	63	54	-14 (<1 veh)	-1 (<1 veh)
		SBR	50	**66**	48	**63**	48	-3 (<1 veh)	0
9	SR 218 & Via Verde	WBL/T	-	87	131	97	145	+10 (<1 veh)	+14 (<1 veh)
		NBL/R	-	38	41	36	44	-2 (<1 veh)	+3 (<1 veh)

Table A.9 – Mid-Term (2028) Conditions with and without Improvement Queue Lengths, (continued)

#	Intersection	MVMT	Turn Pocket Length (feet)	Mid-Term Conditions		Mid-Term Conditions with Improvements		Change in Queue Length	
				AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
10	SR 218 & Gen. Jim Moore Blvd	EBL	425	194	216	194	226	0	+10 (<1 veh)
		WBR	150	104	**200**	108	**200**	+4 (<1 veh)	0
		SBL	-	1,115	250	816	224	-299 (12 veh)	-26 (1 veh)
		SBR	125	**200**	156	**200**	158	0	+2 (<1 veh)
12	SR 218 & Safeway Dwy	EBL	25	26	25	**28**	24	+10 (<1 veh)	-1 (<1 veh)
		EBR	115	5	11	6	20	+1 (<1 veh)	+9 (<1 veh)
		WBL	150	43	59	47	60	-4 (<1 veh)	+1 (<1 veh)
		NBL/T/R	-	84	347	84	445	0	+98 (4 veh)
		SBL/T/R	-	40	51	41	57	+3 (<1 veh)	+6 (<1 veh)

Notes:
1. Roundabout queue lengths calculated using Sidra 8.0, Signalized and SSSC intersection queue lengths were determined using SimTraffic 10 analysis and utilize 10 model runs.
2. Queue Lengths that exceed turn pocket lengths are highlighted/bolded
3. Turn Pocket Lengths with "– "are do not have turn pockets and instead run the length of the roadway segment.
4. Intersections 2 and 3 combine to become one single lane roundabout.
5. SR 218 and Hilby Avenue, due to a change in preferred alternative the same results as No Project were substituted, no new simulation was run.

A.10 Speed, Travel Time and Emissions Analysis

Methodology

This section examines travel pattern, travel time and emission impacts for the increase in traffic volumes and impact of improvements between the Existing, Short-Term (2023), Mid-Term (2028) and Mid-Term (2028) Condition with Improvement scenarios. The average estimated travel time for each analysis scenario and roadway segment was determined using a SimTraffic microscopic multi-modal traffic flow simulation of the study area network. The SimTraffic traffic model simulates traffic conditions using various input parameters including driver behavior, roadway geometry, travel speed, vehicle characteristics, intersection traffic control, trip distribution, and traffic volumes.

Average travel times, uninterrupted speed, and emissions for each studied roadway segment were computed by timing the duration simulated vehicles in the model would travel between two designated control points. These travel times were calculated for each direction of travel on the roadway.

SimTraffic Simulation Outputs including delay time, travel time, average speed, distances and emissions queueing can be found in **Appendix A.6**.

Travel Time Analysis and Uninterrupted Speed Results

The average travel time in Existing Conditions in the AM peak hour between Del Monte Boulevard and State Route 68 along State Route 218 estimated to be 5.7 minutes in the eastbound direction and 6.5 minutes in the westbound direction, with average travel speeds of 28 mph and 25 mph respectively. In the PM peak hour, the estimated travel time is 5.4 minutes in the eastbound direction and 5.9 minutes in the westbound direction, with average travel speeds of 30 mph and 27 mph respectively.

The average travel time in Short-Term (2023) Conditions in the AM peak hour is estimated to be 5.9 minutes in the eastbound direction and 5.6 minutes in the westbound direction, with average travel speeds of 28 mph and 29 mph respectively. In the PM peak hour, the estimated travel time is 5.6 minutes in the eastbound direction and 6.1 minutes in the westbound direction, with average travel speeds of 29 mph and 26 mph respectively.

The average travel time in Mid-Term (2028) Conditions in the AM peak hour is estimated to be 6.0 minutes in the eastbound direction and 5.6 minutes in the westbound direction, with average travel speeds of 27 mph and 28 mph respectively. In the PM peak hour, the estimated travel time is 5.6 minutes in the eastbound direction and 7.0 minutes in the westbound direction, with average travel speeds of 29 mph and 23 mph respectively.

The average travel time in Mid-Term (2028) Conditions with Improvements in the AM peak hour is estimated to be 6.2 minutes in the eastbound direction and 5.9 minutes in the westbound direction, with average travel speeds of 26 mph and 27 mph respectively. In the PM peak hour, the estimated travel time is 6.0 minutes in the eastbound direction and 6.6 minutes in the westbound direction, with average travel speeds of 29 mph and 23 mph respectively.

Table A.10 summarizes the finding of the corridor travel times by scenario.

Table A.10 – Corridor Travel Time by Scenario (in minutes)

Segment Direction	Existing Conditions		Short-Term Conditions		Mid-Term Conditions		Mid-Term Conditions with Improvements	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
EB	5.7	5.4	5.9	5.6	6.0	5.6	6.2	6.0
WB	6.5	5.9	5.6	6.1	5.6	7.0	5.9	6.2

Notes:
1. Corridor times determined using SimTraffic 10, with 10 random seedings.
2. Corridor travel time in minutes, speed estimates are based on a distance of 2.7 miles.

The following table summarizes the uninterrupted travel speed the average driver would feel if they drive through the corridor experiencing little to no delay. Average travel speed discussed above with corridor travel time is the average speed for the corridor, including delay and stopped time experienced at intersections. **Table A.11** summarizes the findings of the uninterrupted travel speed travel times by scenario.

Table A.11 – Uninterrupted Corridor Speed by Scenario

Segment Direction	Existing Conditions		Short-Term Conditions		Mid-Term Conditions		Mid-Term Conditions with Improvements	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
EB	41.4	42.5	42.6	42.3	42.6	42.4	41.3	41.1
WB	42.1	42.6	42.4	43.3	43.0	42.1	41.4	41.8

Notes:
1. Uninterrupted travel speed determined using SimTraffic 10, with 10 random seedings.
2. Speed limit is 35 mph from SR 1 to just west of Fremont Blvd and 45 mph from west of Fremont Blvd to SR 68, the expected free flow travel speed based on the speed limit is 42.4 mph

Relative Emission Analysis Results Using SimTraffic

The increase in vehicle emission due to transportation improvements is of major concern for roadway users and neighboring communities. Projects must balance the impact to vehicle operations with providing bicycle and pedestrian amenities that encourage a reduction in vehicle use. It should be noted that the shift in mode share and increase in alternative transportation modes such walking or bicycling as a result of the project improvements are not considered in the analysis.

Total emissions of hydrocarbons, carbon monoxide, and nitrous oxide emissions increase in all scenarios with the increase in traffic. The addition of improvements in the Midterm conditions lowers total emissions in the AM peak hour, but slightly increases them in the PM peak hour.

Table A.12 summarizes the changes to vehicle emissions by scenario to compare the changes due to increased traffic and proposed improvements.

Table A.12 – Vehicle Emissions by Scenario

Emissions	Existing Conditions		Short-Term Conditions		Mid-Term Conditions		Mid-Term Conditions with Improvements	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Hydrocarbon Emissions								
Total Emissions (g)	2,740	3,175	2,880	3,289	3,054	3,334	3,005	3,480
Emissions per entering vehicles (g/veh)	0.37	0.36	0.37	0.36	0.38	0.36	0.38	0.37
Carbon Monoxide Emissions								
Total Emissions (g)	110,968	127,496	122,350	133,341	128,203	135,605	128,162	141,335
Emissions per entering vehicles (g/veh)	15.07	14.35	15.91	14.50	16.03	14.48	16.09	14.97
Nitrous Oxide Emissions								
Total Emissions (g)	9,768	11,289	10,331	11,787	10,955	11,887	10,794	12,355
Emissions per entering vehicles (g/veh)	1.33	1.27	1.34	1.28	1.37	1.27	1.35	1.31

Notes:
1. Emissions were estimated using SimTraffic 10 default emissions setting, with 10 random seedings

APPENDIX B | INTERSECTION TRAFFIC COUNTS

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- Online Survey Summary
- Community Meeting #1 Summary
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APPENDIX F | SHORT-TERM CONCEPTUAL LAYOUT RECOMMENDATIONS

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APPENDIX K | CANYON DEL REY (SR 218) IMPROVEMENT PROJECT: ENVIRONMENTAL FATAL FLAW ANALYSIS, RINCON CONSULTANTS

APPENDIX A.1 | SYNCHRO OUTPUT SHEETS – EXISTING CONDITIONS

APPENDIX A.2 | SYNCHRO OUTPUT SHEETS – SHORT-TERM (2023) CONDITIONS

APPENDIX A.3 | SYNCHRO OUTPUT SHEETS – MID-TERM (2028) CONDITIONS

APPENDIX A.4 | SYNCHRO AND SIDRA OUTPUT SHEETS – MID-TERM IMPROVEMENT CONDITIONS

APPENDIX A.5 | CALTRANS REVIEW OF FREMONT BOULEVARD ALTERNATIVES

APPENDIX A.6 | SIMTRAFFIC SIMULATION OUTPUTS

CANYON
DEL REY BLVD