

Fehr&Peers

West of 101 Complete Streets Study

Alternatives Evaluation

Prepared for:
City of South San Francisco

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Appendix A: Existing Conditions

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Introduction

Fehr & Peers developed 10% conceptual designs for seven corridors in the City of South San Francisco (City). These seven corridors were selected for the West of 101 Complete Streets Study (“the Study”) because they were previously identified as part of the High Injury Network in the City’s General Plan and identified for planned or upgraded facilities in the City’s Active South City Plan. The Study explored the feasibility of implementing recommendations from the City’s Active South City Plan considering geometric constraints and impacts to multimodal safety, multimodal connectivity, vehicle operations, and transit operations. The following report provides a summary of the considerations and assumptions in developing the concept designs, and approach for the alternatives evaluation. Each corridor is presented as a separate chapter including existing conditions data, design considerations and decisions, and findings from the evaluation.

Corridors:

Hickey Boulevard is an east–west arterial connecting Skyline Boulevard to El Camino Real. It runs through residential neighborhoods and provides access to Alta Loma Middle School, shopping centers, and other community amenities.

Hillside Boulevard is an east–west corridor along the northern border of the City of South San Francisco, extending from west of Lawndale Avenue to Linden Avenue. It runs along the edge of hillside residential neighborhoods and provides access to schools, parks, a fire station, and the Town of Colma to the northwest.

Mission Road is an east–west corridor between Lawndale Avenue / McLellan Drive and Chestnut Avenue. It primarily serves residential areas and provides access to the South San Francisco BART station and Centennial Way Trail.

Grand Avenue is an east–west connector and connects through the Downtown core. It spans from Mission Road to east of Airport Boulevard and US 101. It supports access to the South San Francisco Caltrain Station and a mix of commercial, residential, civic, and community uses.

Spruce Avenue is a north–south collector running between El Camino Real and Sister Cities Boulevard. It serves primarily commercial uses to the south and primarily residential areas to the north. The street provides access to community amenities such as parks, schools, and the South San Francisco Fire Department, as well as the San Bruno BART Station.

Orange Avenue is a north–south local street connecting El Camino Real to residential areas extending to the Sign Hill Trailhead, north of Grand Avenue. It serves residential areas and provides access to schools and community facilities.

Downtown is the City’s civic and commercial hub, centered along Grand Avenue. It features shops, restaurants, and public buildings, serving as a gathering place for residents and visitors. For the purposes of this study, Downtown is defined as the area along Grand Avenue and Miller Avenue from Spruce Avenue to Airport Boulevard, as well as five individual intersections being studied along Maple Avenue and Linden Avenue.

Design Approach

The overarching goal for these designs is to advance a vision for modal balance which improves the connectivity, experience, and safety for people walking, biking, taking transit, and driving. The designs prioritize right sizing the number of vehicle lanes for existing vehicle volumes, advancing connectivity for people walking and biking, and implementing responsive and proactive safety improvements. The proposed active transportation facilities are based upon the recommendations from the Active South City Plan shown in **Table 0.1** and the modal prioritization are derived from policies and roadway typologies in the South San Francisco 2040 General Plan, as shown in

Table 0.2.

Table 0.1. Active South City Recommended Bikeways

Study Corridor	Active South City Facility
Hickey Boulevard	Class IV Separated Bikeway
Hillside Boulevard Sister Cities Boulevard	Class IIB Buffered Bike Lane Class IV Separated Bikeway
Mission Road	Class IIB Buffered Bike Lane
Grand Avenue	Class IV Separated Bikeway
Orange Avenue	Class IIIB Bike Boulevard and Class IIB Buffered Bike Lanes
Spruce Avenue	Class IV Separated Bikeway

Table 0.2. General Plan Definitions

Study Corridors	General Plan Definition
Hickey* Hillside*	<p>Existing Boulevard (Arterial) Prioritize person throughput and safety over vehicle delay or parking. Key design features include:</p> <ul style="list-style-type: none"> • Multiple lanes of vehicle traffic in each direction with dedicated left turn lanes • Buffered or protected bike lanes, including intersection conflict treatments • Appropriate lane striping and widths to manage vehicle speeds and collision severity • Comfortable sidewalks and crosswalks usually a minimum of 10 feet wide, including median refuge islands and curb bulbs to reduce crossing distance • Landscaping and stormwater management infrastructure • Speed limits of 25 mph with an option to set higher speed limits if appropriate

Study Corridors	General Plan Definition
Mission* Grand* Spruce Orange	<p>Existing Connector (Collector)</p> <p>Provide mobility space for all travelers, accommodate a moderate volume of travelers. Key design features may include:</p> <ul style="list-style-type: none"> • Typically a single lane of vehicle traffic in each direction, sometimes accompanied by on-street parking or dedicated left turn lanes • Buffered or protected bike lanes, including intersection conflict treatments • Appropriate lane striping and widths to manage vehicle speeds and collision severity • Comfortable sidewalks and crosswalks usually a minimum of eight feet wide, including median refuge islands and curb bulbs to reduce crossing distance • Landscaping and stormwater management infrastructure <p>Speed limits of 25 mph to prioritize safety</p>
Downtown	<p>Existing Main Street (Collector)</p> <p>Typically serve as destination corridors rather than through routes, with lower traffic speeds, higher pedestrian and bicycle volumes, and flexible use of curb space for high-turnover on-street parking, loading, bicycle parking, and parklets. Key design features may include:</p> <ul style="list-style-type: none"> • Typically a single lane of vehicle traffic in each direction + flexible curb space • On-street commercial loading areas • Sidewalks a minimum of 10 feet wide, bulb outs, and mid-block crosswalks • Bike lanes on designated corridors • Parklets and outdoor café seating • Landscaping and stormwater management infrastructure • Speed limits of 25 mph to prioritize safety
Hickey* Hillside* Mission* Grand*	<p>Transit Priority Corridor*</p> <p>Corridors that serve high frequency bus and shuttle routes under existing or future conditions. Key design features include:</p> <ul style="list-style-type: none"> • Transit only lanes • Transit signal priority • In-lane, far-side bus stops • Bus bulbs (with bike lane bypasses on designated bike corridors) • Queue jumps • Bus shelters • Sidewalk and crosswalk gap closures

*Streets that are transit priority corridors.

In addition to the City’s planning and policy guidance, we applied guidance from other state and federal resources to align recommendations with appropriate multimodal facilities and safety countermeasures. We applied guidance from the FHWA¹ to assess the feasibility of implementing a road diet along applicable corridors based upon vehicle volume thresholds. We evaluated the appropriate bikeway facilities along the corridors based upon Caltrans Design Information Bulletin 94 (DIB-94) Complete Streets: Contextual Design Guidance. **Figure 0.1** shows the preferred bike facility for a roadway based upon its daily traffic volumes and posted speeds. Additional resources

¹ https://safety.fhwa.dot.gov/road_diets/guidance/info_guide/ch3.cfm#s31

referenced throughout the design process include the NACTO Urban Bikeway Design Guide, FHWA guidance for unsignalized crossings, and the California MUTCD.

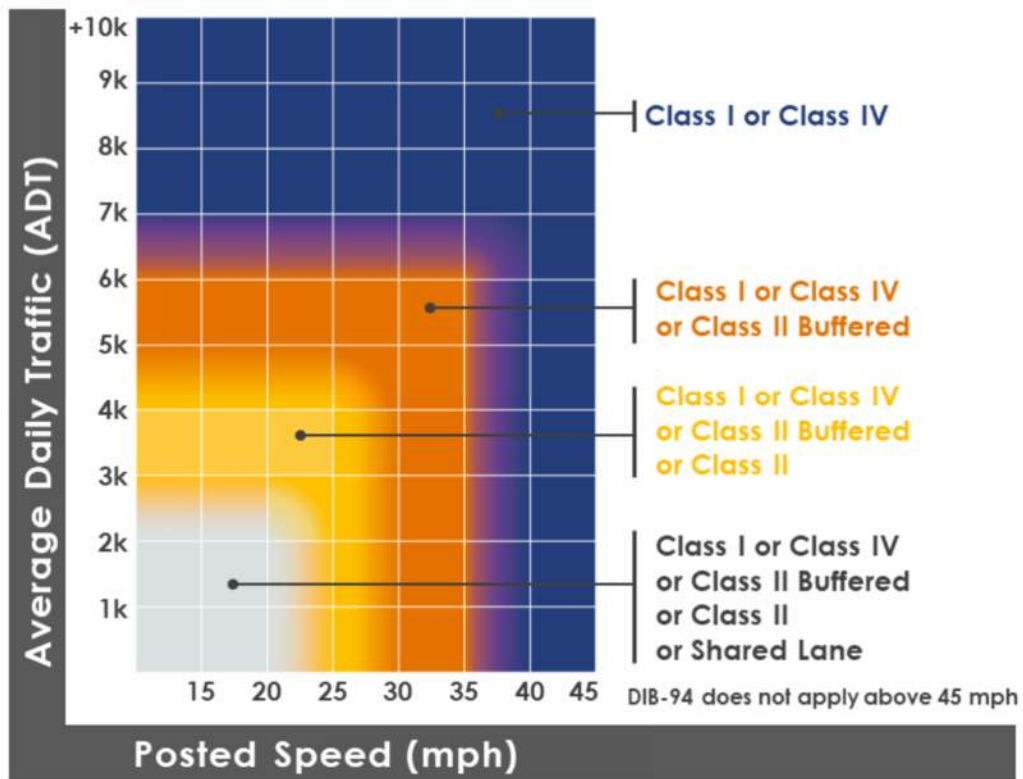


Figure 0.1. Recommended Bicycle Facilities for Urban Areas, Suburban Areas, and Rural Main Streets (DIB-94)

Evaluation Approach

The proposed designs are evaluated on their impact to safety, operations, and connectivity across all modes, aligned with the goals and policies from the 2022 General Plan. **Table 0.3** provides a summary of the metrics used to evaluate each alternative.

Table 0.3. Summary of Evaluation Metrics

Evaluation Category	Evaluation Metric
Vehicle Operations	<ul style="list-style-type: none"> Does the proposed design support existing volumes compared to planning-level volume thresholds? To what extent does the proposed design accommodate future forecasted volumes along the corridor?
Transit	<ul style="list-style-type: none"> Does the proposed design provide transit only lanes, queue jumps, in-lane/far-side bus stops, and other design features that allow for improved bus speed and reliability? Does it allow for the inclusion of TSP in future detailed design?

Bicycle Experience and Connectivity	<ul style="list-style-type: none"> • Does it meet recommended bikeway type for speeds and volumes per DIB-94 Guidelines? • Does it meet the recommendations in the Active South City Plan (i.e., the city’s Bicycle and Pedestrian Master Plan)? • Do intersection designs facilitate movements that are separated in space and, where signalized, separated in time?
Pedestrian Experience and Connectivity	<ul style="list-style-type: none"> • Does the design provide continuous sidewalks with the recommended widths in the General Plan for corridor type? • Does the design shorten crossing distances, provide advanced stop bars, provide Leading Pedestrian Intervals (LPIs) at signals, or otherwise incorporate crossing treatments aligned with FHWA guidance for uncontrolled crossings²?
Multimodal Safety	<ul style="list-style-type: none"> • Does the design remove severe conflicts between road users? • Does the design help slow/manage vehicle speeds? • Does the design facilitate separating conflicts in time where signals are present? • Does the design incorporate appropriate treatments to increase road user attentiveness/awareness where there are severe conflicts? • Quantitative score using the FHWA Safe System Project-based Alignment Framework spreadsheet tool³.

Vehicle Capacity: Fehr & Peers evaluated existing and future volumes compared to the estimated roadway capacity to determine whether proposed alternatives meet vehicle demand. Future volumes were based on the General Plan model with the horizon year of 2040.

² https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/docs/STEP-guide-improving-ped-safety.pdf

³ <https://highways.dot.gov/safety/zero-deaths/safe-system-project-based-alignment-framework>

1. Hickey Boulevard

1.1 Existing Conditions

Hickey Boulevard is an existing four lane arterial with a raised median for most of the roadway. The study extents span from the western city limits to El Camino Real to the east. There are no existing bicycle facilities and no existing on-street parking. Hickey Boulevard serves SamTrans Route 130, which is a high-frequency service (15-minute headways). There are few driveways to access the surrounding land uses which are primarily low density residential and commercial uses. Complete existing conditions information can be found in the Existing Conditions Summary included in **Attachment B**.

Previous Plans and Coordinated Efforts

Active South City Plan (2022): Hickey Boulevard has a level of traffic stress 3 and is identified on the city's HIN. The Plan recommends Class IV separated bike facilities along the corridor. The plan recommends specific intersection spot treatments at intersection with Hilton Street, El Camino Real, and Junipero Serra.

General Plan (2022): Hickey is categorized as an arterial and transit priority corridor, and is included on the city's truck network. The surrounding land uses are primarily zoned for low-density residential and low-density mixed-use.

Bike Lanes for Boulevards (Ongoing): Although no facilities are proposed along Hickey as a part of this effort, the project does propose a Class I shared-use path along the east side of Junipero Serra, which intersects with Hickey Boulevard.

Colma El Camino Real PA&ED (Ongoing): The Town of Colma is currently underway with the Caltrans Design Review Process for El Camino Real, terminating at Hickey Boulevard in South San Francisco. The Project is proposing a Class I shared-use path on the west/south side of El Camino Real, ending at Hickey Boulevard.

Speeds and Volumes

The posted speed along Hickey Boulevard is 40 miles per hour (mph). 2023 E&TS data found 85th percentile vehicle speeds are 40 mph. Bus speeds along Hickey Boulevard are slowest on the westbound approach to Junipero Serra, and generally are between 12 to 18 mph. Vehicle volumes along Hickey are estimated to be between 13,000 and 18,000 vehicles per day from data collected in 2019.

1.2 Design Considerations and Decisions

Corridor Treatments

Hickey has one design alternative which advances Class IV bike facilities without reducing the number of vehicle lanes. The complete concepts are shown at the end of this section in **Figures 1.1 and 1.2**.

Design Vehicle: Hickey is on the city's truck network. The design vehicle for travel along Hickey Boulevard is a WB-67 truck. The design for turning onto and off of Hickey is an SU-30 truck, except at Junipero Serra Boulevard and El Camino Real which use a WB-67 truck.

Bike Facilities: The proposed Class IV facility aligns with the volumes and speeds along the roadway. We propose that the bike facilities are at street level, separated by a six-inch curb at least 2' wide. Where the median is wider than 4', the City may consider landscaping.

Pedestrian Facilities: Currently, Hickey has discontinuous sidewalks on the north side. Although the design proposes to improve the existing sidewalks, steep grading along some segments of the street make it infeasible to include continuous sidewalks on the north side without reducing the number of lanes.

Transit Facilities: The design proposes upgrading existing transit stops to in-lane, far-side stops to be consistent with SamTrans Bus Stop Design Guidelines. Additionally, the design includes a bus layover space on the north side of Hickey Blvd between Camaritas Avenue and El Camino Real. We recommend future engineering for this project include Transit Signal Priority and consider converting the outside lanes of Hickey to Bus Only Lanes. Such additional transit improvements would be consistent with Hickey's designation as a Transit Priority Corridor in the city's General Plan. Existing ADT is below 25,000 vehicles per day indicating a single general purpose vehicle lane in each direction with left-turn lanes at intersections would provide sufficient capacity⁴.

Vehicle Lanes: The proposed design does not reduce the number of vehicle lanes along the corridors but narrows the width to 11' to help manage vehicle speeds and provide space for separated bicycle facilities.

Intersection Treatments

Junipero Serra Blvd/Longford Drive: At Junipero Serra, the design proposes to remove three of the four existing right-turn slip lanes to simplify the intersection and reduce conflicts between vehicles and bicycle and pedestrian crossings. The design uses a length of 150 feet for the dedicated right-turn pocket for westbound Hickey Boulevard; if needed these could be refined in future engineering. However, we recommend the lengths of such turn pockets not preclude or prevent the separated bike facilities from continuing all the way to the intersection. The southeast corner presents challenges for truck turning movements, necessitating that the slip lane remains in place, however we recommend this movement be signalized to eliminate yielding conflicts with vehicles traveling eastbound along Hickey Boulevard.

The design also proposes a protected intersection design to provide separate space for people traveling by bike; the protected intersection also connects to the Class I shared-use path along Junipero Serra to the south, as proposed in the Bike Lanes for Boulevards project. The design proposes new pedestrian crossings across the north and east leg, and all pedestrian crossings are upgraded to high visibility markings and straightened to meet accessibility guidelines.

The proposed design assumes the signal phasing for this intersection includes leading pedestrian intervals, bike phases which are separated in time from conflicting vehicle turn movements (i.e. no

⁴ https://safety.fhwa.dot.gov/road_diets/guidance/info_guide/ch3.cfm#s31

right turn on red restrictions and separated right turn phase), and transit signal priority along Hickey Boulevard. Longford Drive remains a signalized, partial-access intersection.

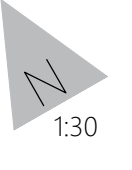
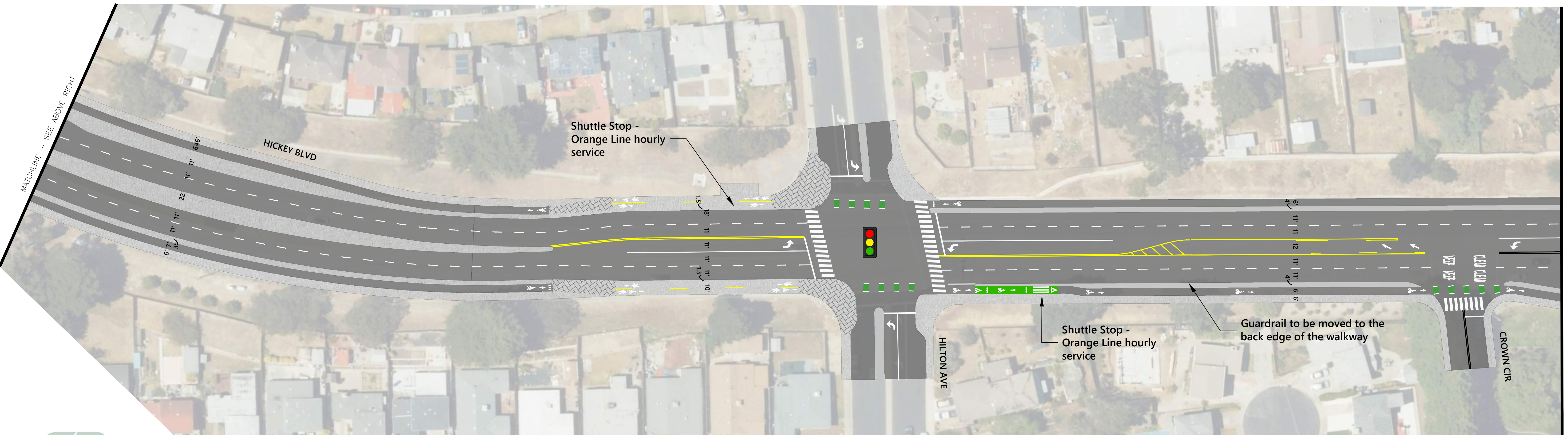
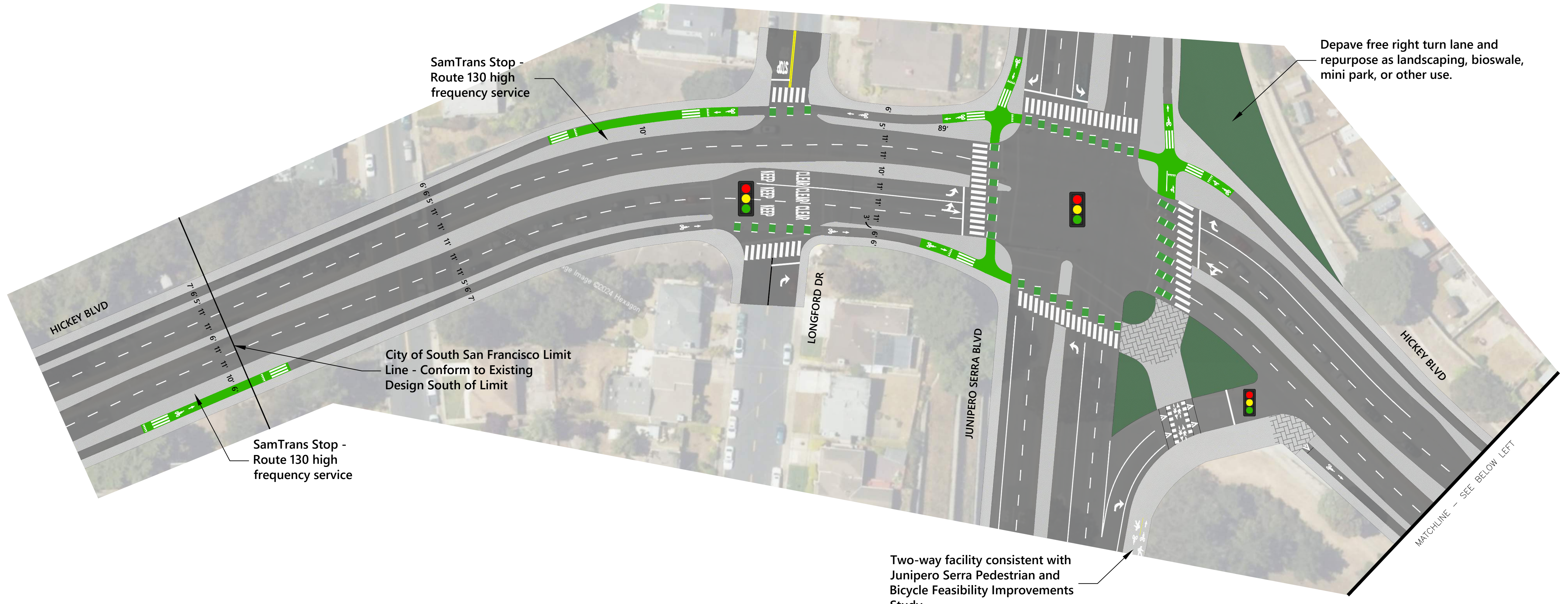
Hilton Avenue: The design proposes bulb outs along Hilton Avenue while maintaining the existing lane configuration. The proposed design assumes signal phasing for this intersection adds leading pedestrian intervals and protected left turn phases for Hilton Avenue.

Crown Court: The design does not propose any changes to the existing configuration and side street stop control for Crown Court.

Camaritas Avenue: The design reduces the turning radii at the intersection to 20 feet, straightens the existing east leg crossing, and upgrades the crossing to high-visibility markings. The proposed design assumes the signal phasing for this intersection include leading pedestrian intervals.

El Camino Real: The design does not propose changes to the existing vehicle lane configuration at El Camino Real. The proposed design for Hickey assumes the plans for this intersection conform to the PA&ED plans for the Town of Colma and investigate the need for a double right turn pocket from Hickey onto El Camino Real.

CADD FILE: c:\p\p\p\Box\Projects\SF\Projects\SF-Projects\SF-1339.04_West_of_101_CompleteStreets\CAD\Batch 2 - Orange Hickey Hickeys\1339.04-Concept\Hickey_7-14-25.dwg
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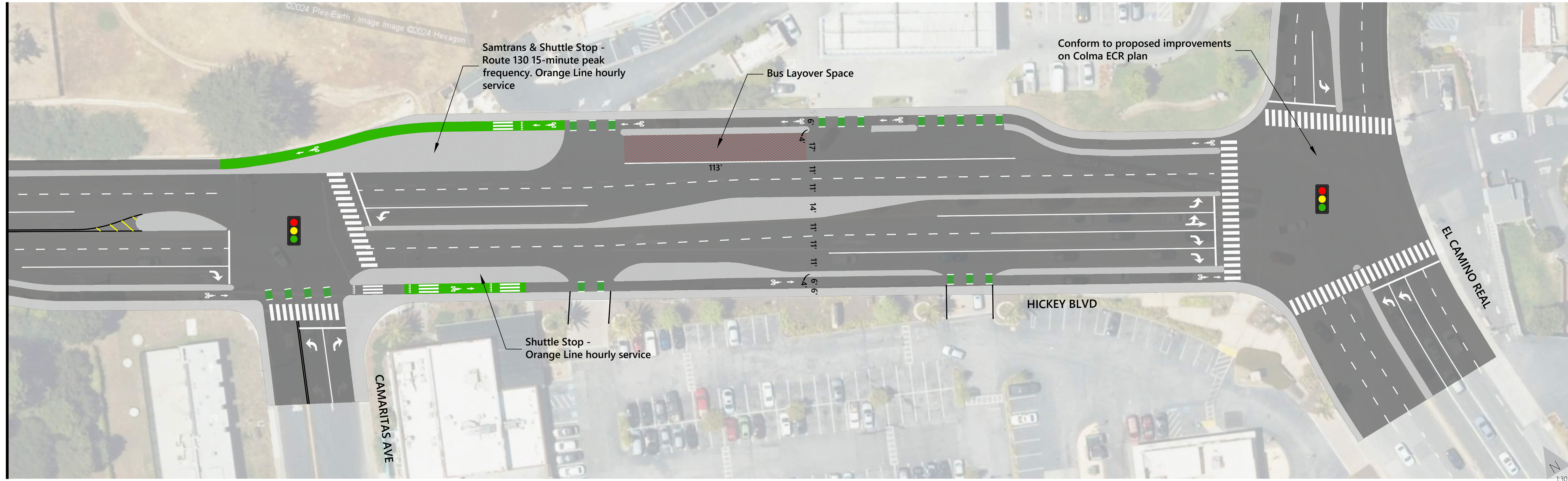


CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 1.1 - Hickey Boulevard
South San Francisco West 101 Complete Streets

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MATCHLINE - SEE PREVIOUS SHEET



CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 1.2 - Hickey Boulevard
South San Francisco West 101 Complete Streets

1.3 Design Evaluation

The following table provides an overview of the rankings for each evaluation category.

Category	Metric	Ranking
Vehicle Operations	Does the proposed design support existing volumes compared to planning-level volume thresholds?	●
	Does the proposed design accommodate future forecasted volumes along the corridor?	●
Transit	Does the proposed design provide transit only lanes, queue jumps, in-lane/far-side bus stops, and other design features that allow for improved bus speed and reliability?	◐
	Does it allow for the inclusion of TSP in future detailed design?	●
Bicycle Connectivity	Does the design meet recommended bikeway type for speeds and volumes per DIB 94 Guidelines?	●
	Does the design align with recommendations in the Active South City Plan?	●
	Does the signal phasing and/or intersection treatments facilitate protected movements for bikes?	●
Pedestrian Connectivity	Does the proposed design provide continuous sidewalks with recommended widths per General Plan corridor type?	◐
	Does the design shorten crossing distances, provide advanced stop bars, implement LPIs at signals, and/or implement FHWA-aligned crossing treatments for uncontrolled crossings?	●
Safety	Does the design remove severe conflicts between road users?	●
	Does the design help slow/manage vehicle speeds?	◐
	Does the design facilitate separating conflicts in time where signals are present?	●
	Does the design incorporate treatments to increase user attentiveness/awareness at locations with severe conflicts?	●

● - Meets metric

◐ - Partially meets metric

⊘ - Does not meet metric

Vehicle Capacity

The proposed design does not remove vehicle lanes, and Hickey is able to accommodate existing and future demand based on estimated capacity thresholds, as shown in **Table 1.1**.

Table 1.1 Existing and Future Forecasted Traffic Volumes

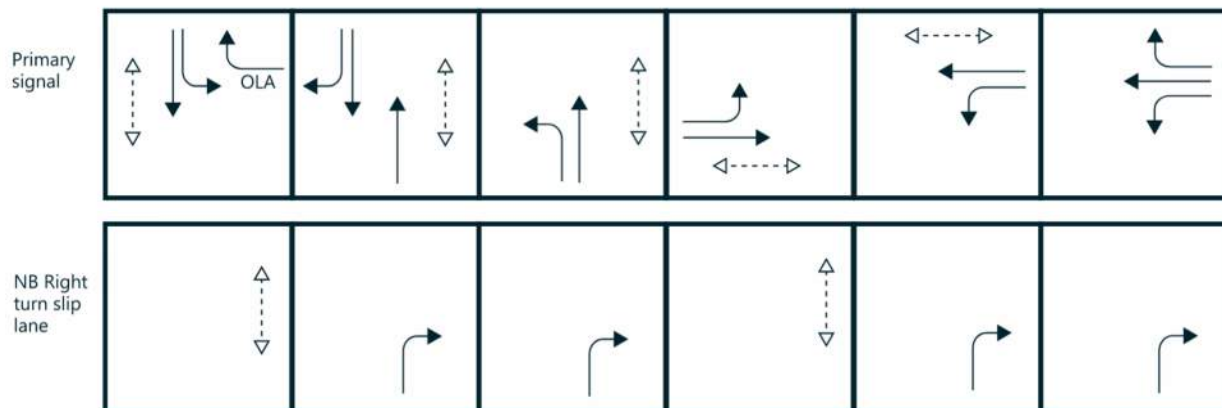
	Existing Volumes	Future Volumes	Capacity
Existing Condition	15,500	24,900	36,000
Proposed Alternative	15,500	24,900	36,000

The proposed design does make significant changes to the vehicle lane configuration at the intersection of Hickey Boulevard and Junipero Serra Boulevard, as described above. Fehr & Peers performed an isolated intersection operation analysis using Synchro to understand how the proposed configuration could impact operation at the intersection. As shown in **Table 1.2** the intersection is estimated to maintain, but not worsen, the amount of delay at the intersection. The proposed signal phasing diagram is shown in **Figure 1.3**.

Table 1.2 Hickey/Junipero Serra Intersection Operations

	Intersection	Eastbound	Westbound	Northbound	Southbound
Existing	63.4 / E	41.8 / D	83.2 / F	50.1 / D	66.3 / E
Proposed	60.4 / E	63.2 / E	57.4 / E	48.2 / D	74.3 / E

Figure 1.3 Hickey/Junipero Serra Proposed Phasing Diagram



Transit

Hickey Blvd is a Transit Priority Corridor, and is therefore evaluated against the key design features listed in the General Plan. The proposed design includes in-lane, far-side bus stops. Maintaining the capacity of the roadway means in the near-term we do not expect transit vehicles to experience additional delay or congestion compared to existing conditions. As noted above, we recommend future engineering include Transit Signal Priority at signals along the corridor and consideration be given to converting the outside lanes to Bus Only Lanes given existing and forecasted ADT is below 25,000 vehicles per day.

Bicycle Connectivity

The proposed Class IV bike facilities align with the recommended bikeway type based on speeds and volumes from DIB 94 and align with the recommendations in the Active South City Plan. Most intersections have a shared through-right turn lane along Hickey which prevents full protected phasing, however the implementation of leading pedestrian intervals can support semi-protected phasing.

Pedestrian Connectivity

The design cannot accommodate continuous sidewalks on the north side of Hickey between Hilton Avenue and Camaritas Avenue, leaving a gap on the north side for approximately 400 feet. However, the design does provide shorter crossings and other enhancements to improve safety and comfort at intersections.

Multimodal Safety

The Safe System Project-Based Alignment Framework found that the proposed design achieves an overall 30% reduction in fatal and injury crash risk for all users, with a 33% reduction for vulnerable road users and 25% reduction for motor vehicles.

Parking

Not Applicable. There is no existing on-street parking on Hickey Boulevard.

2. Hillside Boulevard, Sister Cities, and Randolph Avenue

2.1 Existing Conditions

Hillside Boulevard is a four-lane arterial which runs east-west along the northern boundary of South San Francisco. The design looks at Hillside Boulevard from Chestnut Avenue to Sister Cities Boulevard, Sister Cities Boulevard from Hillside Boulevard to Airport Boulevard, and Randolph Avenue from Highland Avenue to Airport Boulevard. Hillside Boulevard also includes a frontage road along the south side of the arterial which provides access to the houses along the corridor.

There are existing Class II and Class III bike facilities along Hillside Boulevard and Sister Cities Boulevard and no on-street parking on the arterials. The frontage road along Hillside is a local road with parking on the south side, and Randolph Avenue is a local road with no parking. The land uses along Hillside are residential with access to subdivisions to the north facilitated by connector roads. There are several schools and parks towards the west end of the study segment. Hillside and Sister Cities serve Commute.Org shuttles, and no SamTrans service currently operates along the corridors. Hillside is identified as a Transit Priority Corridor in the city's General Plan.

Previous Plans

Active South City Plan (2022): Recommends Class IIB buffered bike lanes along Hillside Boulevards and Class IV Separated bike lanes along Sister Cities Boulevard.

General Plan (2022): Hillside and Sister Cities are categorized as arterials and transit priority corridors, and are included on the city's truck network. The surrounding land uses are primarily zoned for low density residential and open space.

Speeds and Volumes

The posted speed along Hillside and Sister Cities is 40 mph. 2023 E&TS data found 85th percentile vehicle speeds are between 46 to 49 mph, which is above the posted speeds. Volumes along the corridors are estimated between 18,700 and 24,000 vehicles per day based on data collected in 2019.

2.2 Design Considerations and Decisions

Corridor Treatments

The network of corridors has one design alternative which proposes Class IV facilities where geometrically feasible along the arterials and complimentary Class IIIB bike boulevards along the frontage road and Randolph Avenue. There are no proposed changes to the number of vehicle lanes along the arterials but we recommend dedicating one lane in each direction on Hillside as a Bus Only or BUS HOV (high occupancy vehicle) only lane. The complete concepts are shown in **Figures 2.1 to 2.5** at the end of this section.

Design Vehicle: Hillside Blvd is on the city's truck network. The design vehicle for travel along Hillside Blvd is a WB-67 truck. The design for turning onto and off Hillside Blvd is an SU-30 truck, except at intersecting truck routes (i.e. Chestnut Avenue) which use a WB-67 truck.

Bike Facilities: The designs include Class IV separated bike lanes on Hillside Boulevard from Chestnut Avenue to Lincoln Street and Sister Cities from Hillside Boulevard to Airport Boulevard. These facilities may be separated by a buffer with bollards or a raised concrete median at least 2' wide. Where the geometry is constrained along the arterial between Lincoln Street and Sister Cities Boulevard, the bike facility transitions to an eastbound Class IIIB bike route and westbound contraflow buffered bike lane along the frontage road for Hillside Boulevard. To provide an additional low-stress alternative to the facilities on Sister Cities, we propose a new multi-use connection from the intersection of Hillside Boulevard and Sister Cities Boulevard to a Class IIIB bike boulevard on Randolph Avenue, connecting to Airport Boulevard to the east.

Although the Active South City Plan recommends Class IIB buffered bike lanes along Hillside Boulevard, the facilities proposed in this design align with the appropriate bike facilities for the observed speeds and volumes along the arterials. If the city wishes to include continuous separated bike facilities along Hillside Boulevard, future detailed engineering would be required to determine the need for roadway widening and new retaining walls.

Pedestrian Facilities: Hillside has existing discontinuous facilities on the north side, with continuous sidewalks along the south side. This design does not offer continuous facilities on the north side due to the steep grading which would likely require additional retaining walls and other supportive infrastructure. The crossings from the north side to the south side have been upgraded to improve pedestrian comfort.

Transit Facilities: The design proposes upgrading existing transit stops to in-lane, far-side stops consistent with SamTrans Bus Stop Design Guidelines. We recommend future engineering include Transit Signal Priority at signals. Additionally, the design includes Bus and HOV Only lanes in both directions. Future study could revise those to fully dedicated transit lanes; however, in the near-term the combined designation of Bus and HOV seemed most appropriate for the corridor.

Vehicle Lanes: The proposed design does not physically remove through lanes along Hillside Boulevard; it does repurpose one lane in each direction to Bus and HOV only use. The width of vehicles along the corridor are also narrowed to 11' to help manage vehicle speeds and provide space for separated bicycle facilities.

Intersection Treatments

Chestnut Avenue: The designs conforms to the Chestnut Avenue complete streets plan completed in a prior phase of this effort. The Class I shared use path on the east side of Chestnut connects to the proposed directional Class IV facilities on Hillside using a jughandle design and two-way cross bike markings. The proposed design assumes signal phasing will include a protected phase for this crossing.

A roundabout was evaluated for this intersection and determined to be geometrically infeasible – Hillside is a truck route and to accommodate a multi-lane roundabout the inscribed circular diameter (ICD) would need to be a minimum of 150'. There are approximately 100' available.

Ridgewood Court: Upgrade pedestrian crossing to high visibility markings. Include cross bike markings for eastbound bike facilities. Consider signal phasing that would separate the through bike movement from the eastbound right turn movement.

Lincoln Street: Bicycles transition from directional Class IV facilities along the main line to an eastbound Bicycle Boulevard and westbound contraflow bike lane along the frontage road. Include cross bike markings for westbound bikes (as drawn, or consider a diagonal bicycle crossing). Upgrade pedestrian crossings to high visibility markings. Add a new pedestrian crossing along the west leg to facilitate access to the proposed pedestrian connection on the north side of Hillside Boulevard. Reduce the number of westbound vehicle lanes from two to one lane upstream of the signal.

Kearney Street: Relocate the existing pedestrian crossing in-line with the existing sidewalk along the south side of the frontage road. Move the stop bar for Kearney Street in advance of the crossing, before the frontage road. We recommend future engineering study and confirm that necessary sightlines are met. Install new curb cuts in the existing median between the frontage road and main line to allow westbound bikes to cross while maintaining the right-turn only restriction.

S San Francisco Drive (West)/Jefferson Street: Relocate the existing pedestrian crossing in-line with the existing sidewalk along the south side of the frontage road. Move the stop bar for Jefferson Street in advance the crossing, before the frontage road. We recommend future engineering study and confirm that necessary sightlines are met. Install new curb cuts in the existing median between the frontage road and main line to allow westbound bikes to cross while maintaining the right-turn only restriction. Install curb extensions on the northwest and northeast corner to provide an in-lane bus stop and remove the merge lane, respectively.

Irving Street: Relocate the existing pedestrian crossing in-line with the existing sidewalk along the south side of the frontage road. Move the stop bar for Irving Street in advance the crossing, before the frontage road. Future detailed engineering study must confirm that necessary sightlines are met. Install new curb cuts in the existing median between the frontage road and main line to allow westbound bikes to cross while maintaining the right-turn only restriction.

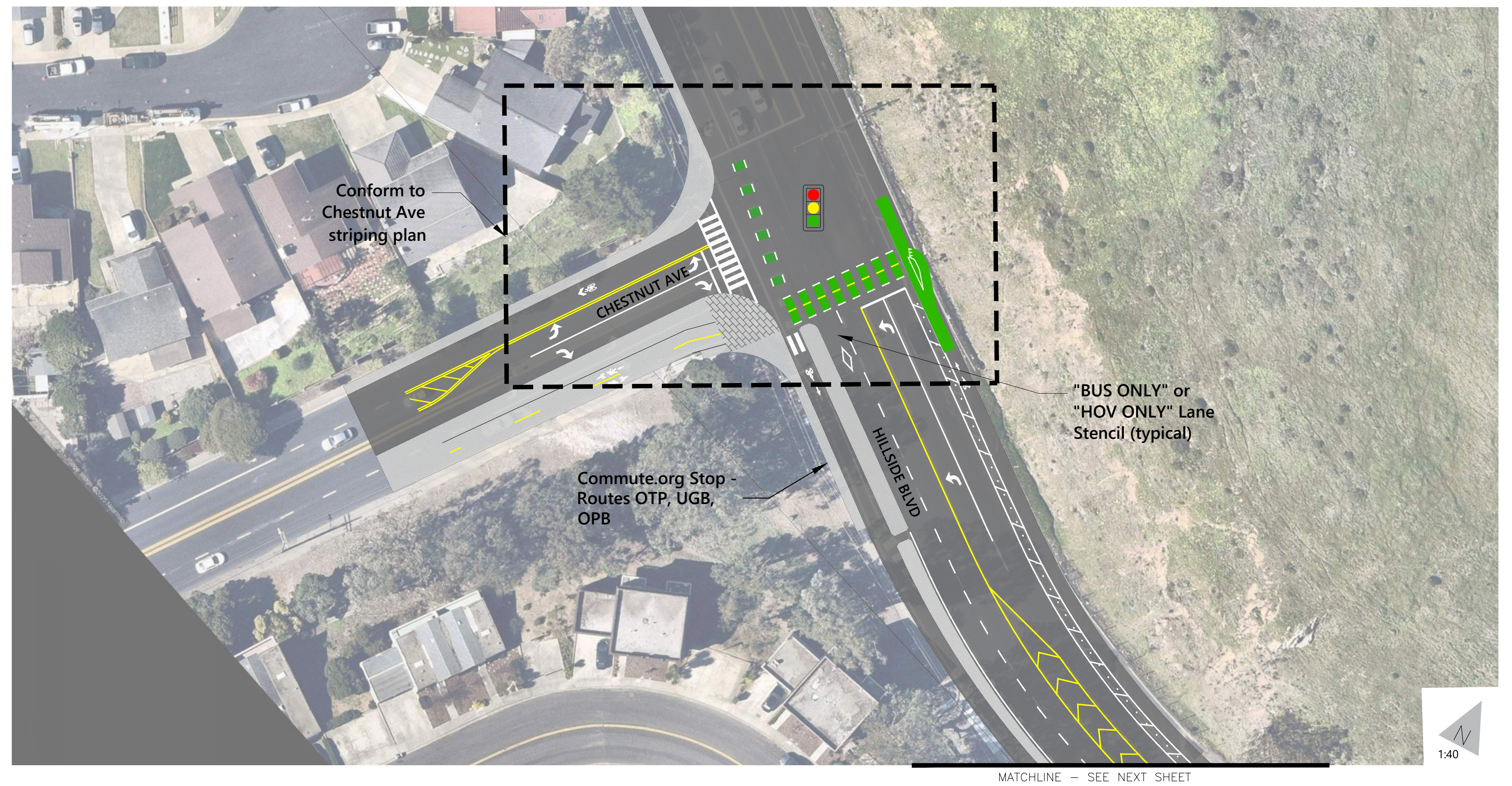
Hillside/Sister Cities Boulevard: Bicycles transition between facilities along the frontage road (eastbound Bicycle Boulevard/westbound contraflow bike lane) to Class IV bollard separated bike facilities along the main line. Provide a bicycle crossing to facilitate the transition for westbound bikes. Additionally, extend the Class II bike lanes along Hillside Boulevard to the south, connecting the existing Class II bike lanes from their current terminus at Highland Avenue to the study intersection.

The design also shows a path connection from the intersection to the proposed bicycle boulevard along Randolph Avenue, within existing city right-of-way, to provide access for bicycles. We recommend future engineering evaluate the feasibility of this path alignment.

South San Francisco Drive (East): No significant changes to the existing configuration. Consider placing the westbound bike facility to the right of the right turn pocket and separating the through bike movement from the vehicle right turn movement using signal phasing.

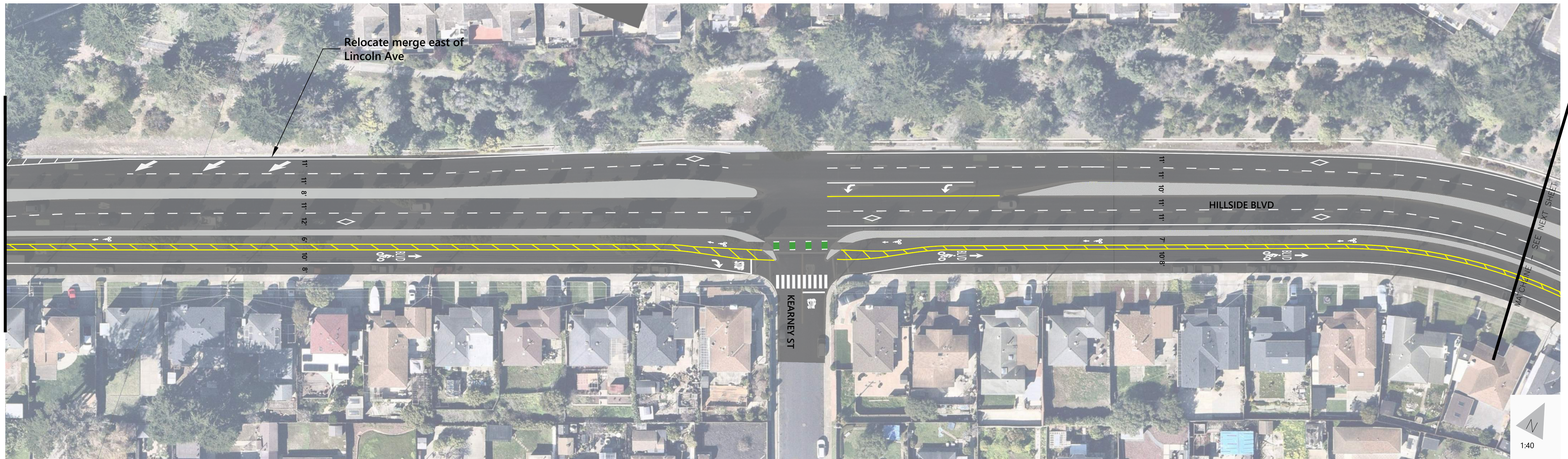
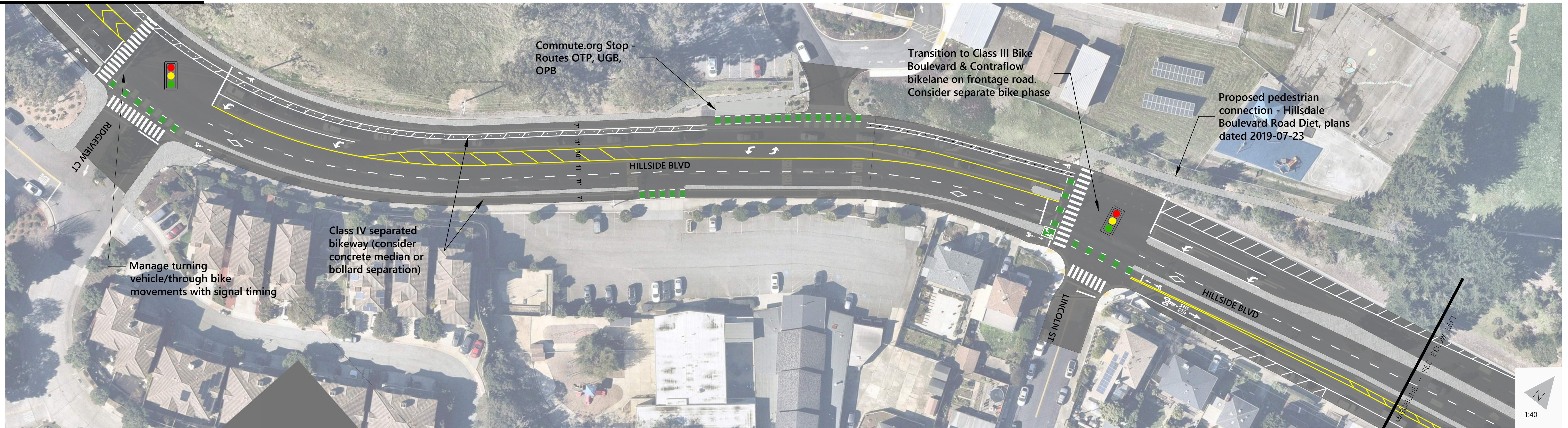
Airport Boulevard: Conform to the proposed designs for Airport Boulevard completed in a previous phase of the project. See concepts in **Appendix B**. Install a path connection from the end of Randolph Avenue to Airport Boulevard to facilitate access for bicycles.

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CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

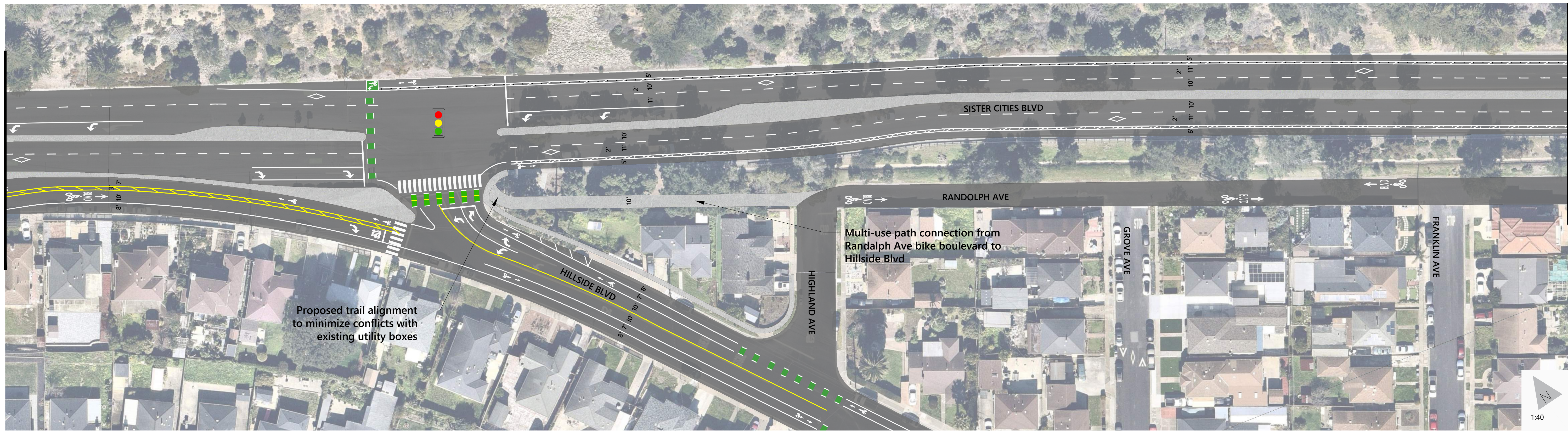
Figure 2.1 - Hillside Boulevard
South San Francisco West 101 Complete Streets



CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 2.2 - Hillside Boulevard
South San Francisco West 101 Complete Streets

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CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 2.3 - Hillside Boulevard
South San Francisco West 101 Complete Streets

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CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 2.4 - Hillside Boulevard
South San Francisco West 101 Complete Streets

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CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 2.5 - Hillside Boulevard
South San Francisco West 101 Complete Streets

2.3 Design Evaluation

Corridor		Alternative
Category	Metric	
Vehicle Operations	Does the proposed design support existing volumes compared to planning-level volume thresholds?	●
	Does the proposed design accommodate future forecasted volumes along the corridor?	⊘
Transit	Does the proposed design provide transit only lanes, queue jumps, in-lane/far-side bus stops, and other design features that allow for improved bus speed and reliability?	●
	Does it allow for the inclusion of TSP in future detailed design?	●
Bicycle Connectivity	Meets recommended bikeway type for speeds and volumes per NACTO Guidelines	●
	Meets recommendations in the Active South City Plan	⦿
	Signal phasing and intersection treatments facilitate protected movements for bikes	●
Pedestrian Connectivity	Provides continuous sidewalks with recommended widths per General Plan corridor type	⊘
	Shortens crossing distances, provides advanced stop bars, LPIs at signals, or other FHWA-aligned crossing treatments for uncontrolled crossings	●
Safety	Removes severe conflicts between road users	●
	Helps slow/manage vehicle speeds	⦿
	Facilitates separating conflicts in time where signals are present	●
	Incorporates treatments to increase user attentiveness/awareness at locations with severe conflicts	●

● - Meets metric

⦿ - Partially meets metric

⊘ - Does not meet metric

Vehicle Capacity

The proposed design does not physically remove vehicle lanes, although it does convert one lane in each direction to a bus and high-occupancy vehicle only lane. Hillside may not be able to accommodate the future forecasted volumes along the corridor, although this does not account for potential changes in mode choice if HOV and transit becomes more attractive and viable with the proposed project.

Table 2.1. Existing and Future Forecasted Traffic Volumes

	Existing Volumes	Future Volumes	Capacity
Existing Condition	24,000	40,400	36,000
Proposed Alternative	24,000	40,400	36,000

Transit

Hillside Blvd is a Transit Priority Corridor and is therefore evaluated against the key design features listed in the General Plan. The proposed design does offers a combined bus and HOV only lane which would support more reliable transit service. The design provides other design changes which support bus speed and reliability including in-lane, far-side bus stops. We recommend in future engineering that signals along the corridor be upgraded to include Transit Signal Priority.

Bicycle Connectivity

The proposed bike facilities meet the recommended bikeway type per DIB 94 guidelines on the respective roadways in the study area. The design deviates from the recommendations in the Active South City Plan; the Active South City Plan recommends Class IIB bike lane along Hillside, which is inconsistent with guidance in DIB-94 based on vehicle volumes and speeds along Hillside. The design proposes Class IV separated bike facilities where feasible, and bike boulevard/class II treatments along the frontage road where the Class IV facility is not feasible.

Pedestrian Connectivity

The proposed design does not provide continuous sidewalks along Hillside Blvd due to prohibitive costs associated with installing sidewalks along the steep embankment on the north side. The design does improve the pedestrian experience where there are existing sidewalks along the south side of street, primarily by moving the crosswalks in line with the path of travel. The proposed design assumes all signalized intersections will include Leading Pedestrian intervals and that all crosswalks will be upgraded to high visibility markings.

Multimodal Safety

The Safe System Project-Based Alignment Framework found that the proposed design achieves an overall 38% reduction in fatal and injury crash risk for all users, with a 43% reduction for vulnerable road users and 33% reduction for motor vehicles. The design provides appropriate low stress facilities for bikes and makes improvements to pedestrian safety; however the design does not significantly

help to manage vehicle speeds. Narrowing the vehicle lanes is one measure to support speed management, and other interventions may include signal coordination to progress vehicles at slower speeds and/or rest-in-red at signals during low volume periods of the day

Parking

The design removes 10 on-street parking spaces east of Lincoln Street and approximately 3 spaces along the frontage roads at the entrance and exits (30 total).

3. Mission Road

3.1 Existing Conditions

Mission Road is a four-lane arterial which runs north-south parallel to El Camino Real. The design scopes into Mission Road from the northern intersection with McLellan Drive and Lawndale Boulevard to its southern T-intersection with Chestnut Avenue. The Centennial Way Trail runs parallel to Mission Road from the intersection with BART to Mission Road's intersection with Oak Avenue. There are no existing on-street biking facilities on Mission. Mission Road sees SamTrans service with the high-frequency Route 130 (15-minute headways) and Route 35 (school-oriented) which serve the South San Francisco BART station and El Camino High School, respectively. The surrounding land-uses are low, to medium, density residential and commercial with BART and the High School as large trip generators.

Previous Plans

Active South City Plan (2022): Mission Road has a level of traffic stress 4 and is recommended to have Class IIB buffered bike lanes between Lawndale and Chestnut for the entire study area stretch. The plan recommends specific intersection spot treatments at intersection with Lawndale Boulevard, Sequoia Avenue, and Grand Avenue.

General Plan (2022): Mission is characterized as a collector, transit corridor, and is included in the city's truck network. The surrounding land uses are zoned for medium-density mixed-use.

Oak Avenue Connection (Ongoing): The General Plan identifies need for adding a north-south connection between El Camino Real and Mission Road via Oak Avenue. The project remains at a planning stage but will provide a connection across El Camino Real to Arroyo Drive for people biking and walking.

Speeds and Volumes

The posted speed along Mission Road is 30 mph. 2023 E&TS data found 85th percentile vehicle speeds are 34 mph. Bus speeds along Mission Road are slowest between Grand and El Camino Real averaging between 6 and 9 mph. Vehicle volumes along Mission are estimated to be 8,200 per day from data collected in 2019.

Collision Analysis

Collision data from 2017 to 2022 shows that, along the corridor, crashes occur most frequently in front of El Camino High School and at the intersection of Mission and Lawndale with injuries reported from vehicle collisions and bike collisions. Rear-ends are the most common vehicle-to-vehicle collision type.

Parking Occupancy

A parking occupancy survey of on-street parking along Mission Road from Sequoia to Evergreen reveals the highest occupancy rate for the observation period was 75%. This peak value indicates that parking removal is viable.

3.2 Design Considerations and Decisions

There are two proposed alternatives for Mission Road: Alternative 1 provides pedestrian safety improvements and other minor improvements while Alternative 2 provides separated bike facilities, pedestrian safety improvements, and a road diet.

Design Vehicle: Mission Road is on the truck network. The design vehicle for travel along Mission Road and for turns on other truck routes (i.e. Chestnut Avenue) is a WB-67 truck. The design vehicle for turns onto local road is an SU-30 truck.

Alternative 1: Corridor Treatments

Alternative 1 for Mission Road maintains the current vehicle lanes. The design upgrades the existing Class I shared use path near the BART station and maintains the Class III bike route on the remainder of the corridor. The concepts are shown at the end of this section in **Figures 3.1-3.3**.

Bike Facilities: The proposed Class I facility is 10' wide and formalizes the Centennial Way Trail's transition to run next to the street from BART to Lawndale. Where there is 2' of separation between the path and the road, consider implementing a railing or other vertical delineation. The facility is shared with pedestrians on the west sidewalk and includes mixing zones at intersection corners. The Class III shared lane is marked with green-backed sharrows on the outside lane for the entire corridor.

Pedestrian Facilities: Alternative 1 does not propose changes to the existing sidewalks, but introduces bulb outs, high visibility crossings, and other safety enhancements throughout the corridor.

Transit Facilities: The design proposes upgraded bus stops to in-lane and far-side stops where possible.

Vehicle Lanes: Alternative 1 maintains the vehicle lane configuration, but narrows the lane widths to create a four-foot-wide separation between directions of travel.

Parking: No changes to on-street parking.

Alternative 1: Intersection Treatments

Lawndale Boulevard: Maintain the existing signal and lane configuration, and introduce cross bike striping to facilitate the transition between the shared use path and the Class II bike lanes on the opposite side of the intersection. Upgrade the existing crossings to high visibility markings. Update signal phasing to include leading pedestrian intervals.

BART entrance: Upgrade crossing to standard high visibility markings, install yield markings, and preserve existing RRFB. Stripe a hatched area on the north leg to right-size the number of receiving lanes. Consider a raised median with landscaping between the BART driveways while maintaining the necessary horizontal clear width.

Evergreen Drive: Upgrade crossings to high visibility markings. Consider raised median islands to provide a pedestrian refuge at the intersection. Update signal phasing to include leading pedestrian intervals.

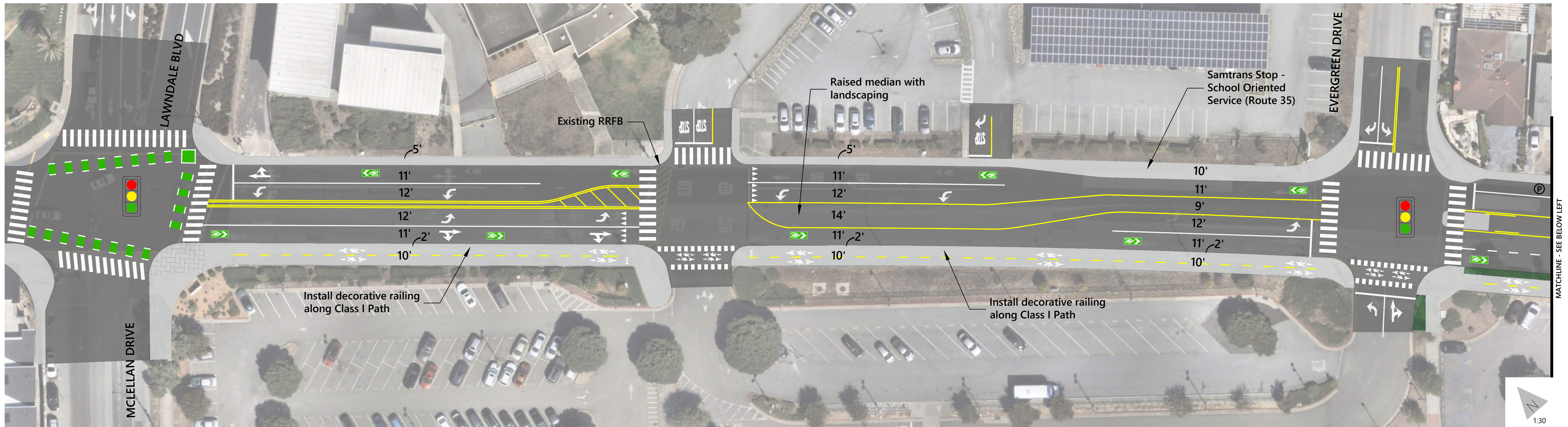
BART: Upgrade crossings to high visibility crossings and install a bulb out along the east side. Install a pedestrian refuge island on the north leg with mountable curb. Along BART, formalize the existing trail to create a seamless connection to the Centennial Way Trail with vertical separation such as planter boxes. Consider signaling if signal warrants are met, otherwise maintain all-way stop-control.

Sequoia Ave, Holly Ave, and Grand Ave: Upgrade crossings to high visibility crossings. Install curb extensions that enforce a more perpendicular intersection alignment. Consider signaling if signal warrants are met, otherwise maintain all-way stop-control.

Centennial Way Trail: At the terminus of the Centennial Way trail, install a new pedestrian crossing with advanced yield markings and an RRFB to facilitate a direct connection to the continuous sidewalk on the opposite side of the street.

Oak Avenue: Conform plans to the design proposed for the development at 1051 Mission Road (Oak Avenue Extension Plans).

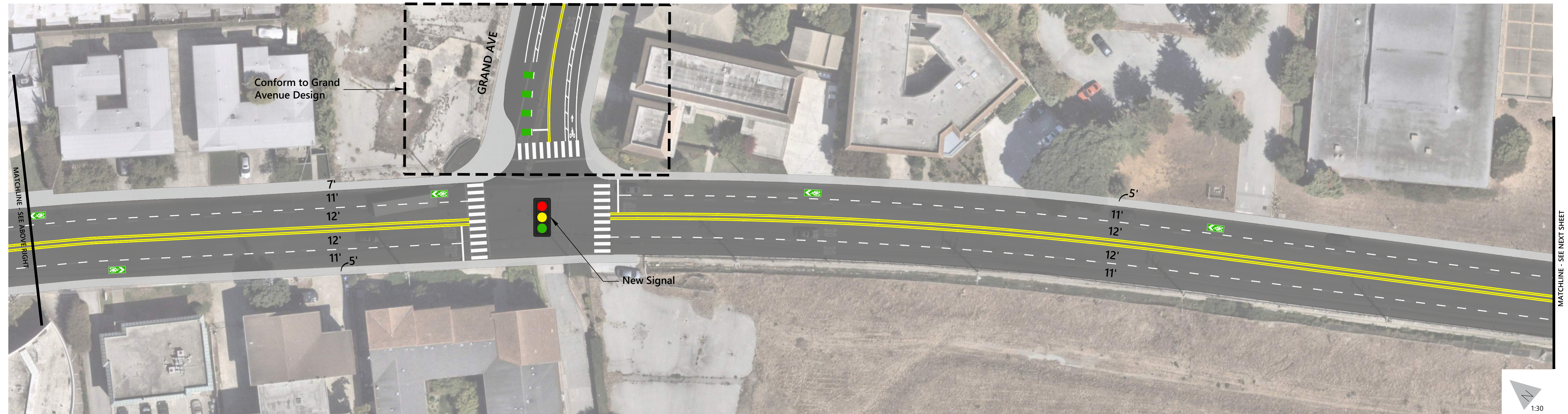
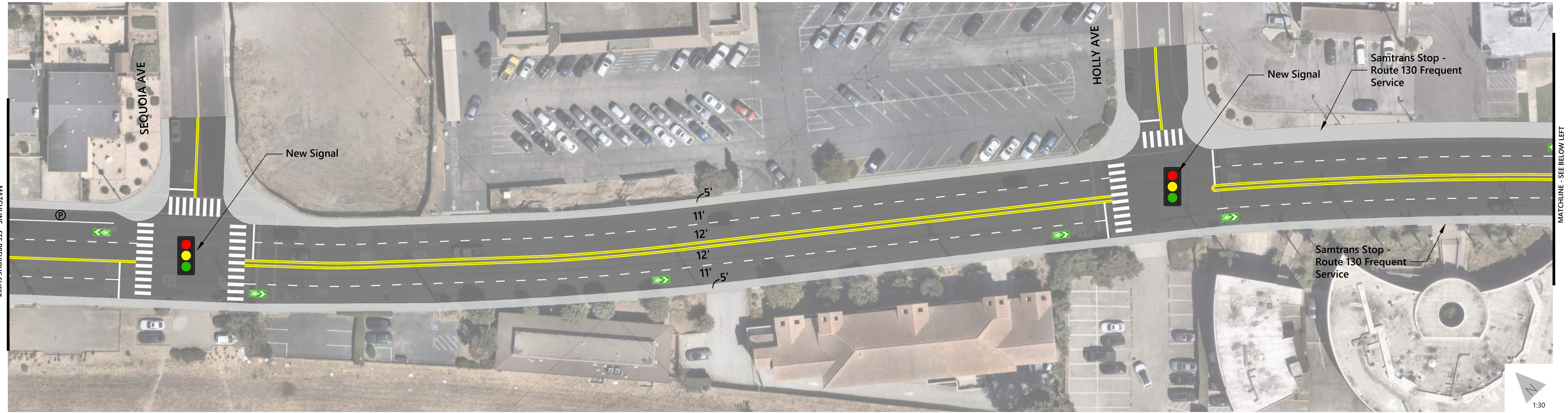
Chestnut Avenue: Install a new pedestrian crossing across the south leg. Install a bulb out on the northwest corner to right-size the number of receiving lanes and shorten crossing distances.



CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

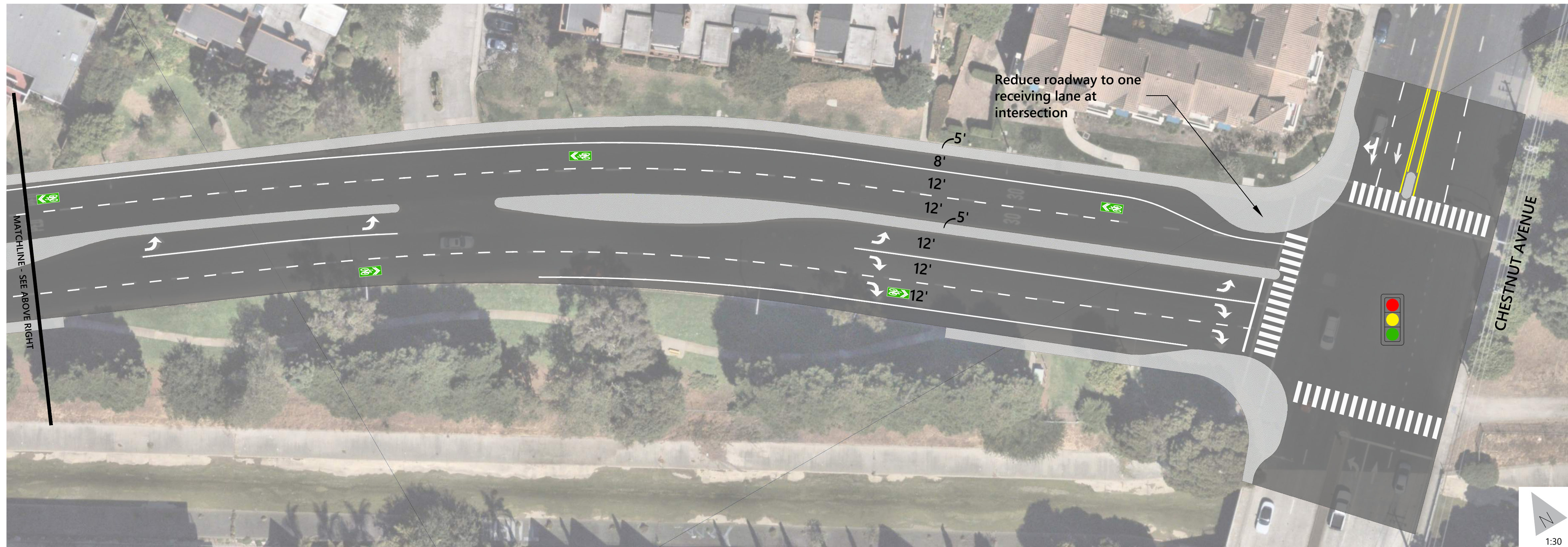
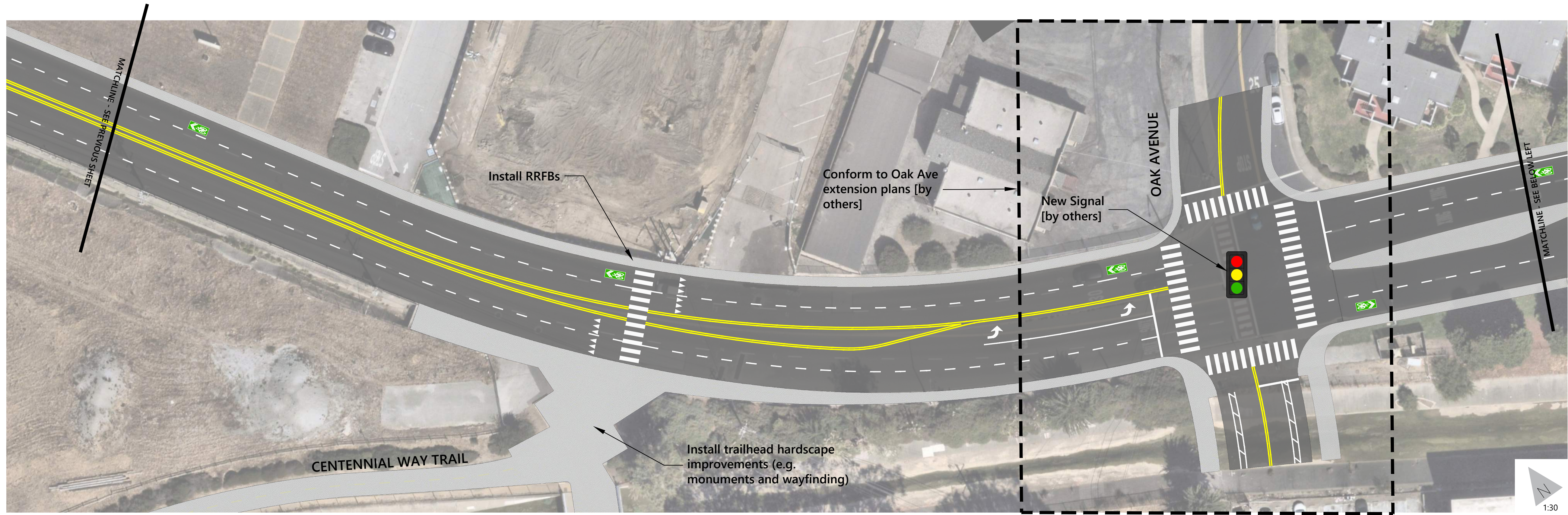
Figure 3.1 - Mission Road
Alternative 1 - Pedestrian Safety & Transit Improvements
South San Francisco West 101 Complete Streets

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CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 3.2 - Mission Road
Alternative 1 - Pedestrian Safety & Transit Improvements
South San Francisco West 101 Complete Streets



CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 3.3 - Mission Road
Alternative 1 - Pedestrian Safety & Transit Improvements
South San Francisco West 101 Complete Streets

Alternative 2: Corridor Treatments

Alternative 2 proposes a road diet for most of the corridor to accommodate a continuous two-way bike facility on the southwest side of the street. The concepts are shown in **Figures 3.4–3.6**.

Bike Facilities: The design proposes a two-way Class IV separated bikeway on the southwest side of Mission Road from Lawndale to Chestnut. The facility varies between sidewalk level and street level with a raised curb to create vertical separation from the vehicle lanes; where the median is wider than 4', the City may consider landscaping. The west side of the street had fewer driveway and intersection conflicts, allowing for a mostly uninterrupted facility. Special attention was given to connectivity across intersections to improve the permeability of the facility and facilitate access to neighborhoods east of Mission Road. The Class IV is an appropriate facility given the observed speeds and volumes along the corridor.

Pedestrian Facilities: Alternative 2 maintains the existing sidewalks while proposing new sidewalk to close an existing gap on the southwest side from Grand Ave to the Centennial Way Trail. At intersections, the design introduces bulb outs, high visibility crossings, and other safety enhancements throughout the corridor.

Transit Facilities: The design proposes upgraded bus stops to in-lane and far-side stops where possible.

Vehicle Lanes: Alternative 2 removes one vehicle lane in each direction to maintain a consistent two-lane cross section. The design includes a center left turn pocket from BART to Holley Avenue to reduce delay from vehicles turning left in and out of the driveways and commercial developments. South of Holley, there is no center left turn lane due to constrained geometry, which allows for a continuous sidewalk on the west side of the street. If a center left turn lane is desired through this section, the proposed sidewalk connection would need to be removed.

Parking: No changes to on-street parking.

Alternative 2: Intersection Treatments

Lawndale Boulevard: Maintain the existing signal and lane configuration and introduce cross bike striping to facilitate the transition between the Class IV bikeway and the Class II bike lanes on the opposite side of the intersection. Upgrade the existing crossings to high visibility markings. Update signal phasing to include leading pedestrian intervals.

BART entrance: Upgrade crossing to standard high visibility markings, install yield markings, and preserve existing RRFB. The length of the left turn pockets can be refined in future detailed engineering design.

Evergreen Drive: Upgrade crossings to high visibility markings. Consider raised median islands to provide a pedestrian refuge at the intersection. Update signal phasing to include leading pedestrian intervals.

BART: Upgrade crossings to high visibility crossings and install a bulb out along the east side. Install a pedestrian refuge island on the north leg with mountable curb. Along BART, formalize the existing trail to create a seamless connection to the Centennial Way Trail with vertical separation such as

planter boxes. Consider signalizing if signal warrants are met, otherwise maintain as all-way stop-controlled.

Sequoia Ave: Upgrade crossings to high visibility crossings. Install curb extensions that enforce a more perpendicular intersection alignment. Consider signalizing if signal warrants are met, otherwise maintain as all-way stop-controlled.

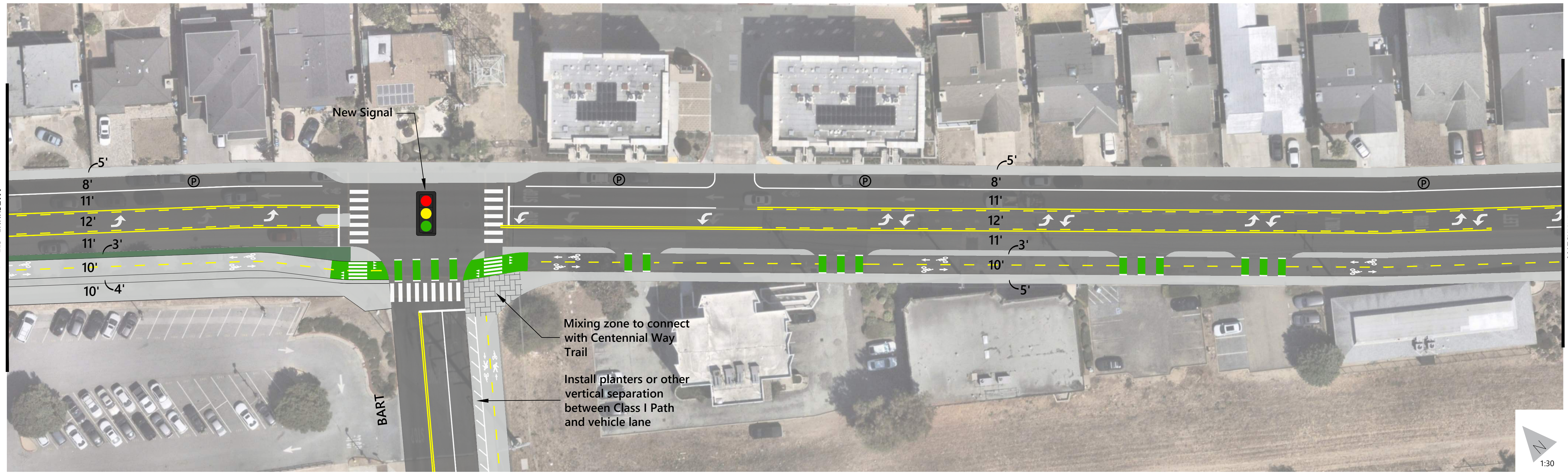
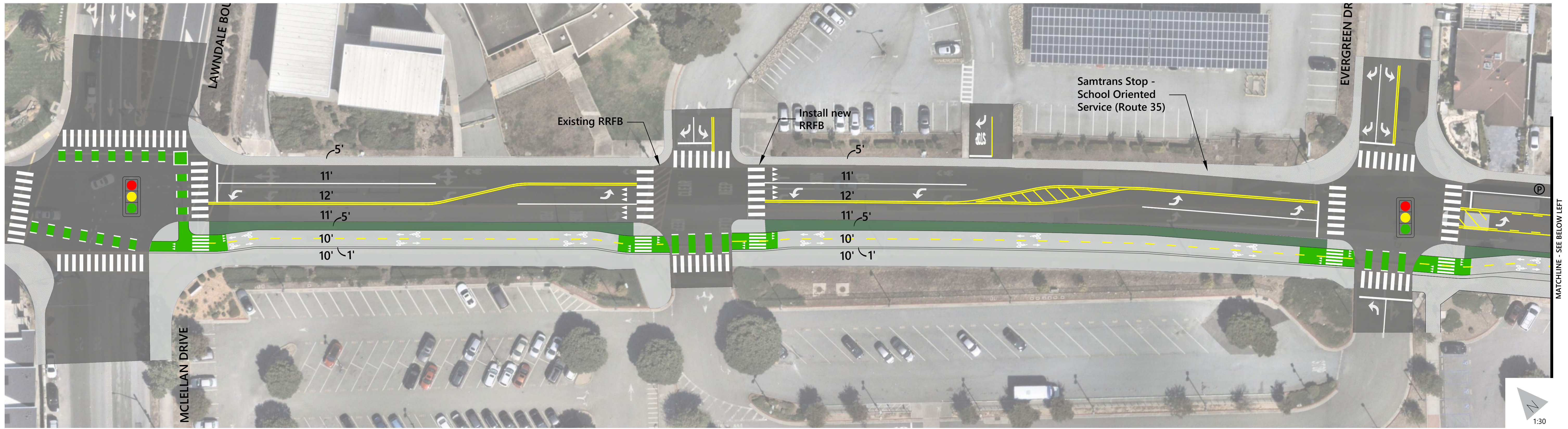
Holly Ave: Upgrade crossings to high visibility crossings. Install curb extensions that enforce a more perpendicular intersection alignment. Consider signalizing if signal warrants are met, otherwise maintain as all-way stop-controlled. Upgrade the bus stop south of the intersection to a bus boarding island.

Grand Ave: Upgrade crossings to high visibility crossings. Install curb extensions that enforce a more perpendicular intersection alignment. Include curb cuts and cross bike markings to facilitate access between the proposed Class II bike lanes on Grand and Class IV bikeway on Mission. Consider signalizing if signal warrants are met, otherwise maintain as all-way stop-controlled.

Centennial Way Trail: At the terminus of the Centennial Way trail, install a new pedestrian crossing with advanced yield markings to facilitate a direct connection to the continuous sidewalk on the opposite side of the street.

Oak Avenue: Conform plans to the design proposed at 1051 Mission Road (Oak Avenue Extension Plans). Tie in the Class II bike facilities on the west leg to create a protected intersection. This will require curb modifications to the current intersection realignment design.

Chestnut Avenue: Extend the proposed Class I Path along Chestnut from Commercial Ave to Mission Road, shown in **Appendix B**. Install a shared use crossing along the south leg.

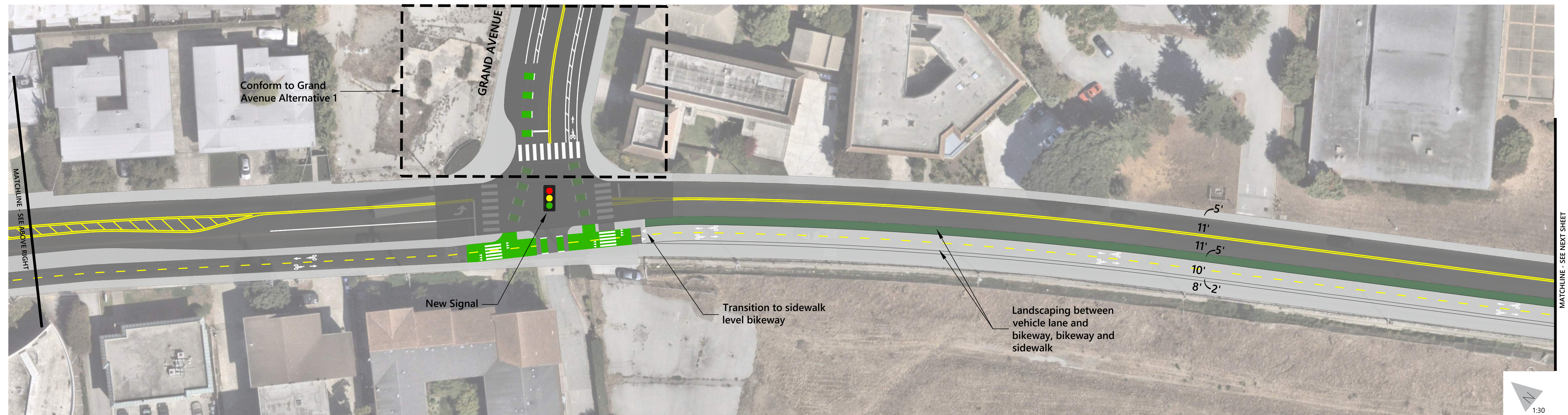
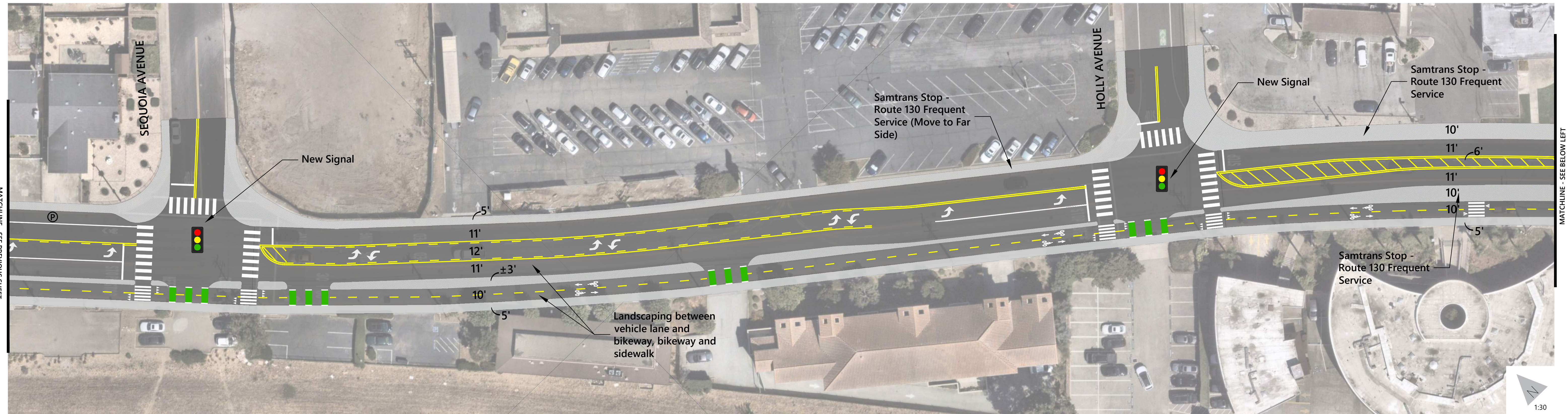


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CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

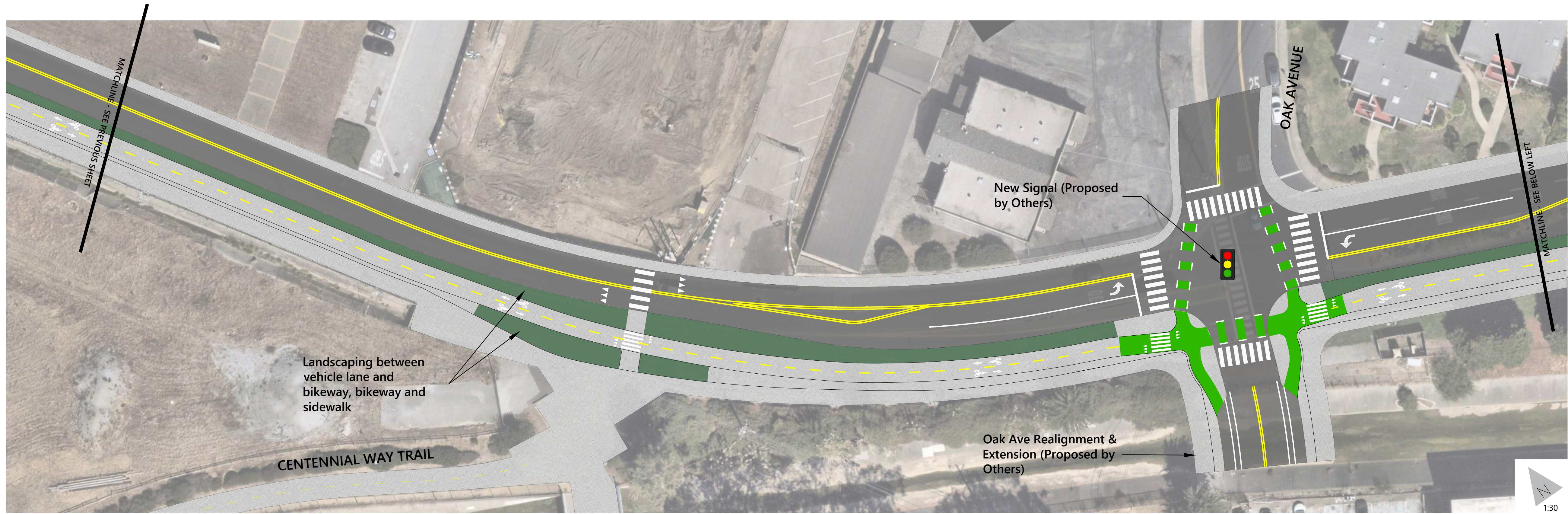
Figure 3.4 - Mission Road
 Alternative 2 - Road Diet & Two-Way Bikeway
 South San Francisco West 101 Complete Streets



CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 3.5 - Mission Road
Alternative 2 - Road Diet & Two-Way Bikeway
South San Francisco West 101 Complete Streets

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CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 3.6 - Mission Road
Alternative 2 - Road Diet & Two-Way Bikeway
South San Francisco West 101 Complete Streets

3.3 Design Evaluation

Corridor		Alternative 1	Alternative 2
Category	Metric		
Vehicle Operations	Does the proposed design support existing volumes compared to planning-level volume thresholds?	●	●
	Does the proposed design accommodate future forecasted volumes along the corridor?	●	●
Transit	Does the proposed design provide transit only lanes, queue jumps, in-lane/far-side bus stops, and other design features that allow for improved bus speed and reliability?	◐	◐
	Does it allow for the inclusion of TSP in future detailed design?	◐	◐
Bicycle Connectivity	Does the design meet recommended bikeway type for speeds and volumes per DIB 94 Guidelines?	⊘	●
	Does the design align with recommendations in the Active South City Plan?	⊘	●
	Does the signal phasing and/or intersection treatments facilitate protected movements for bikes?	⊘	●
Pedestrian Connectivity	Does the proposed design provide continuous sidewalks with recommended widths per General Plan corridor type?	◐	●
	Does the design shorten crossing distances, provides advanced stop bars, implement LPIs at signals, and/or implement FHWA-aligned crossing treatments for uncontrolled crossings?	◐	●
Safety	Does the design remove severe conflicts between road users?	⊘	●
	Does the design help slow/manage vehicle speeds?	⊘	◐
	Does the design facilitate separating conflicts in time where signals are present?	⊘	●
	Does the design incorporate treatments to increase user attentiveness/awareness at locations with severe conflicts?	⊘	●

● - Meets metric

◐ - Partially meets metric

⊘ - Does not meet metric

Vehicle Capacity

Alternative 1 does not remove vehicle lanes, while Alternative 2 removes one lane in each direction. Both Alternatives can accommodate existing and future demand based on estimated capacity thresholds, as shown in **Table 3.1**.

Table 3.1 Existing and Future Forecasted Traffic Volumes

	Existing Volumes	Future Volumes	Capacity
Existing Condition	8,200	14,300	36,000
Proposed Alternative 1	8,200	14,300	36,000
Proposed Alternative 2	8,200	14,300	17,800

Transit

Alternative 1: Although this design does not propose dedicated transit lanes, it does provide in-lane, far-side bus stops which will support improved bus speed and reliability. It maintains the capacity of the roadway so transit vehicles would not experience additional delay or congestion compared to existing conditions. If signals are introduced along the corridor, include Transit Signal Priority.

Alternative 2: The design provides in-lane, far-side bus stops. It introduces a road diet, which may result in some increases in delay for transit vehicles during peak hours. If signals are introduced along the corridor, include Transit Signal Priority.

Bicycle Connectivity

Alternative 1: There are no proposed changes to the existing bike facilities, maintaining the Class III shared lanes which do not meet the recommended bikeway type based on speeds and volumes from DIB 94 and do not align with the recommendations in the Active South City Plan.

Alternative 2: The proposed Class IV bikeway meets the recommended bikeway type based on speeds and volumes from DIB 94 and align with the recommendations in the Active South City Plan. This project has not evaluated detailed signal phasing, but we recommend protected left turn phasing and LPIs to reduce the frequency and severity of conflicts between vehicles and bicycles and pedestrians.

Pedestrian Connectivity

Alternative 1: The proposed design does not close the existing sidewalk gaps. While some crossing distances along the side streets are shortened with bulb outs, crossing distances remain the same along the main line.

Alternative 2: The road diet alternative would improve the pedestrian experience by closing the sidewalk gaps along the west side of the street and shortening crossing distances.

Multimodal Safety

Alternative 1: The Safe System Project–Based Alignment Framework found that the proposed design achieves a 24% reduction in fatal and injury crash risk for all users, with a 21% reduction for vulnerable road users and 31% reduction for vehicles.

Alternative 2: The Safe System Project–Based Alignment Framework found that the proposed design achieves an overall 54% reduction in fatal and injury crash risk for all users, with a 59% reduction for vulnerable road users and 42% reduction for motor vehicles.

Parking

Alternative 1: The design removes four of the 24 existing on–street parking spaces to accommodate bulb outs and daylighting along Mission Road (16% reduction).

Alternative 2: The design also removes four of the 24 existing on–street parking spaces to accommodate bulb outs and daylighting along Mission Road (16% reduction).

4. Grand Avenue

4.1 Existing Conditions

Grand Avenue is a two-lane arterial which runs east-west from Mission Road through the South San Francisco industrial area on the city's eastern side. The study area stretches from Mission Road to Spruce Avenue. The corridor has parking on both sides of the street with SamTrans Route 130 (15-minute headways) high-frequency service and Route 37 (school-oriented) which serves South San Francisco High School and Alta Loma Middle School. There are existing Class IIB buffered bike lanes from Chestnut Ave to Spruce Ave and shared lane Class III bike facilities from Chestnut Ave to Mission Road.

Previous Plans

Active South City Plan (2022): Grand Avenue has level of traffic stress ranging from 3 to 4 and the plan recommends Class IV protected bike lanes. The plan also recommends intersection spot treatments at the intersections with Willow Avenue, Orange Avenue, and Magnolia Avenue.

General Plan (2022): Grand is categorized as a collector, transit corridor, and is not included on the city's truck network. Land uses are planned to be updated to medium, to medium-high density residential along Grand.

Speeds and Volumes

The posted speed along Grand Avenue is 25 mph. 2023 E&TS data found 85th percentile vehicle speeds are between 30 and 33 mph. Bus speed along Grand are slowest between Eucalyptus Avenue and Chestnut Avenue heading west with speeds between 6 and 15 mph. Vehicle volumes are estimated to be 6,800 per day from data collected in 2019.

Collision Analysis

Collision data from 2017 to 2022 shows injury and severe crashes for all road users. A fatal bike crash was reported at the intersection of Locust and Grand. Severe pedestrian crashes are reported at intersections with Eucalyptus and Spruce with injuries involving vehicles and pedestrians appear throughout the corridor.

Parking Occupancy

A parking occupancy survey across the entire Grand Avenue study area found that parking utilization remained relatively high. Peak evening period from 8–9 PM saw 100% capacity met for multiple blocks, and high utilization on other blocks on Grand.

4.2 Design Considerations and Decisions

Corridor Treatments

Design Vehicle: Grand Avenue is not a truck route. The design vehicle for travel along Grand Avenue is a SamTrans 40' bus and for turn on and off of Grand Avenue is an SU-30 truck.

Bike Facilities: The design maintains the existing Class IIB buffered bike lanes from Spruce Avenue to Chestnut Avenue and introduces new Class IIB buffered bike lanes from Chestnut Avenue to Mission Road to create a continuous connection along the corridor.

The project team investigated the potential to upgrade the existing facilities to Class IV parking separated facilities, but the constrained cross section cannot accommodate recommended widths for the on-street parking buffer and lane widths. The project team did not move forward with an alternative showing parking protected bike facilities because it would require substandard dimensions. City staff determined on-street parking utilization was too high to consider on-street parking removal. Future planning efforts could investigate parallel routes which may be able to provide lower-stress bike facilities.

Pedestrian Facilities: The design does not propose changes to the existing sidewalks, but introduces bulb outs, high visibility crossings, and other safety enhancements throughout the corridor.

Transit Facilities: The design proposes upgraded bus stops to in-lane and far-side stops where possible.

Vehicle Lanes: There are no proposed changes to vehicle lane configurations except for some turn pocket configuration changes at intersections, described in more detail below.

Parking: On-street parking is maintained, except to accommodate bus boarding islands and bulb outs.

Intersection Treatments

Mission Road: Upgrade crossings to high visibility markings and install bulb outs which enforce a more perpendicular intersection geometry. Consolidate the left and right-turn lanes to one lane along Grand. If the implementation of bike facilities on Mission precedes the bike lanes on Grand, include cross bike markings to connect the facilities. Consider signaling if signal warrants are met, otherwise maintain all-way stop-control.

Forest View Road: Install a new pedestrian crossing with RRFBs.

Willow Avenue: Upgrade crossings to high visibility crossings and install bulb outs. Install a bus boarding island for both existing bus stops east of the intersections, allowing buses to make in-lane stops. Taper the bike lanes to run between the boarding island and the face of curb, with raised crossings to facilitate pedestrian access.

Oak Avenue and Aldenglen Drive: Upgrade crossings to high visibility crossings and install bulb outs on the northern corners. Remove all left turn pockets to reduce sight line conflicts and multiple lane approaches at a stop-controlled intersection. Close the northbound right turn slip lane, but maintain access to the existing residential driveway. Further study and outreach required to confirm driveway movements are feasible.

Chestnut Avenue: Conform to designs in the Chestnut Avenue Concept included in **Appendix B**. Apply treatments for a dedicated intersection including mountable corner islands. Keep the bike facilities on Grand curbside through the intersection, resulting in the removal of 22 on-street parking spaces on the east leg. If the implementation of the Class I path on Chestnut precedes the bike lanes on Grand, bikes traveling westbound on Grand may access the path on Chestnut using the shared use crossing. Otherwise, maintain the existing conflict striping and sharrow through the left turn lane.

Laurel Ave: Install high visibility crossings on all legs with bulb outs. Install advanced yield markings and consider RRFBs to align with recommendations in the FHWA STEP Guide⁵.

Eucalyptus Ave: Upgrade crossings to high visibility markings. Install bulb outs on the northeast and southwest corners. On the northwest corner, install a bus boarding island. Taper the bike lanes to run between the boarding island and the face of curb, with raised crossings to facilitate pedestrian access. On the southeast corner, install a bus bulb where buses will board in the bike lane and bikes may queue behind the bus. Although this is a less desirable design for bike operations, it maintains access for an existing residential driveway.

Acacia Avenue: Install high visibility crossings on all legs. Consider median refuge islands as an alternative treatment to bulb outs, which support driver attentiveness, manage vehicle speeds, and reduce crossing distances. This would require removing two on-street parking spaces on each corner (eight total). Consider RRFBs to align with recommendations in the FHWA STEP Guide⁵.

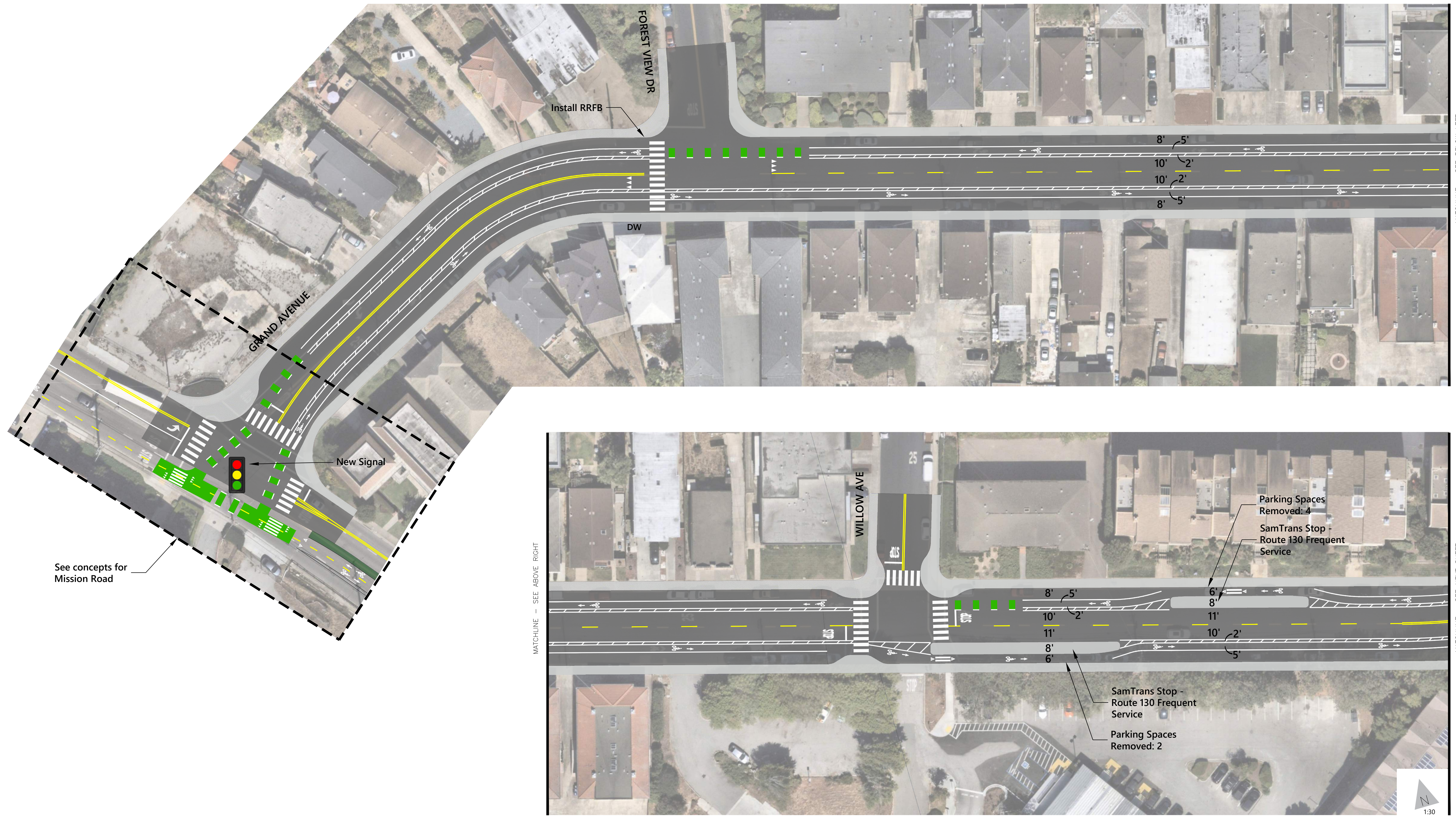
Orange Avenue: Install bulb outs on the northeast and southwest corners. On the northwest and southeast corner, install a bus boarding island. Taper the bike lanes to run between the boarding island and the face of curb, with raised crossings to facilitate pedestrian access.

Magnolia Avene: On the northwest corner, install a bus boarding island. Taper the bike lanes to run between the boarding island and the face of curb, with raised crossings to facilitate pedestrian access. On the southeast corner, consider relocating the existing SamTrans stop to the far side of the intersection. Install a bus bulb where buses will board in the bike lane and bikes may queue behind the bus. Although this is a less desirable design for bike operations, it maintains access for an existing residential driveway.

Spruce Avenue: On the northwest corner, install a bus boarding island. Taper the bike lanes to run between the boarding island and the face of curb, with raised crossings to facilitate pedestrian access. On the southeast corner, install a bus bulb to facilitate in-lane bus boarding. Conform to Downtown and Spruce Ave concepts.

⁵ FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations, Table 1.
https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-07/STEP_Guide_for_Improving_Ped_Safety_at_Unsig_Loc_3-2018_07_17-508compliant.pdf

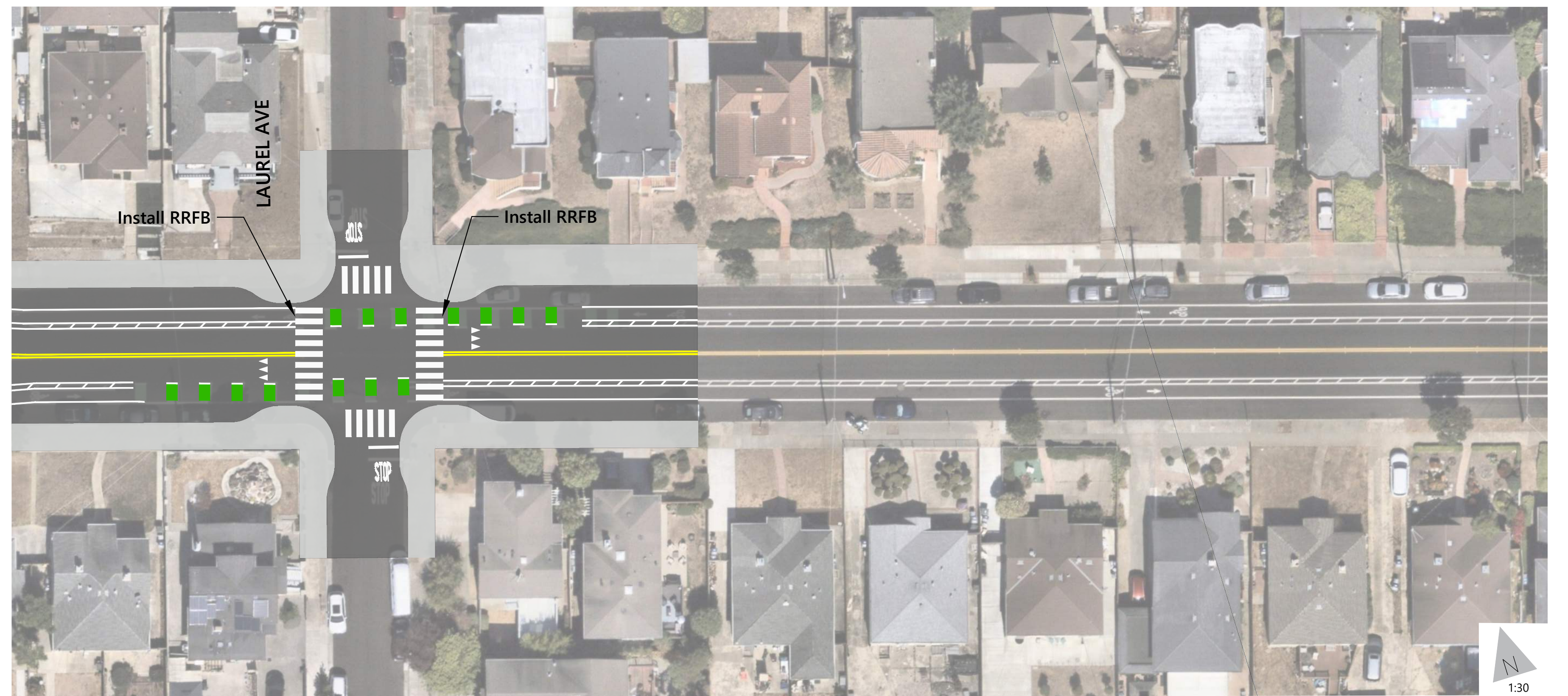
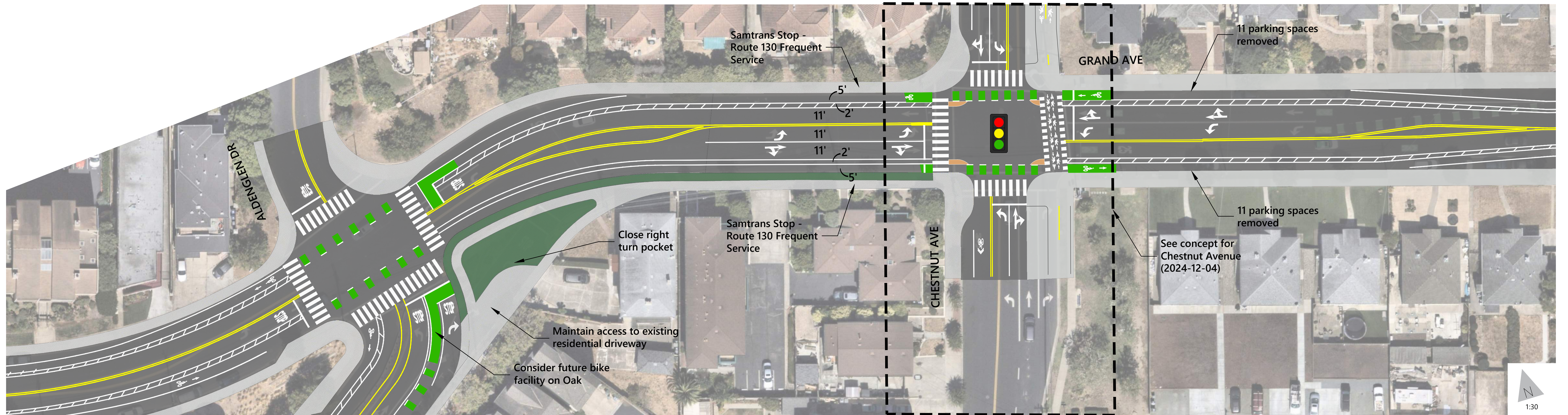
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CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL
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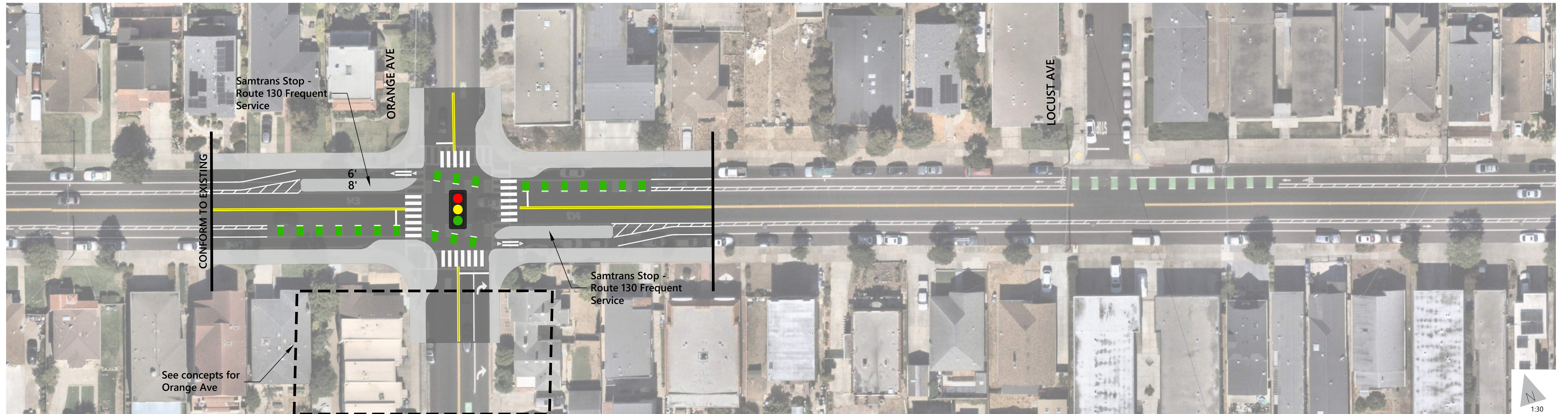
Figure 4.1 - Grand Avenue
South San Francisco West 101 Complete Streets

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CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

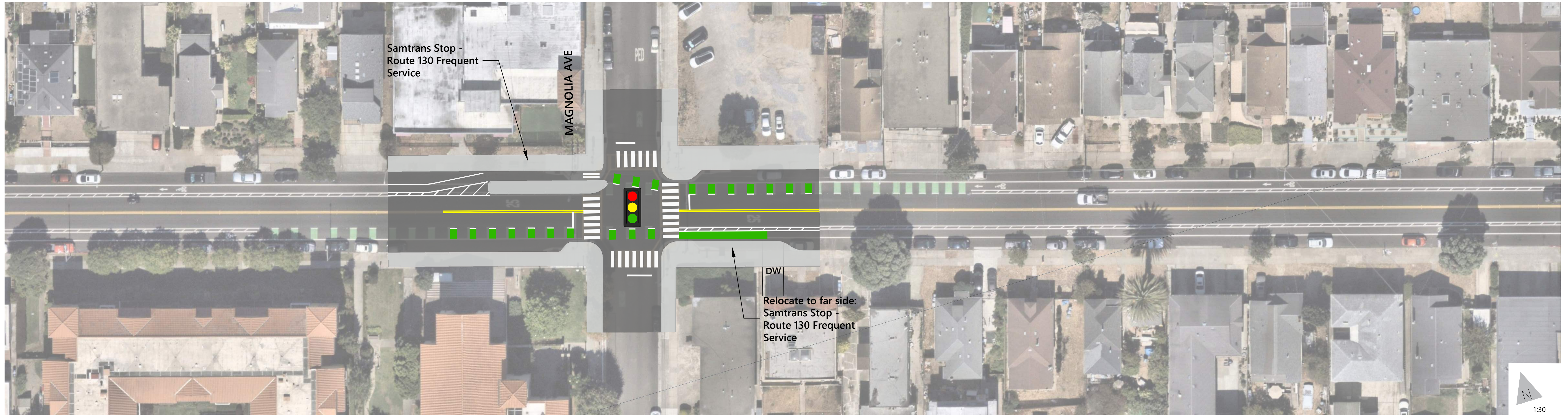
Figure 4.2 - Grand Avenue
South San Francisco West 101 Complete Streets



CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 4.3 - Grand Avenue
South San Francisco West 101 Complete Streets

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CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 4.4 - Grand Avenue
South San Francisco West 101 Complete Streets

4.3 Design Evaluation

Corridor		Alternative
Category	Metric	
Vehicle Operations	Does the proposed design support existing volumes compared to planning-level volume thresholds?	●
	Does the proposed design accommodate future forecasted volumes along the corridor?	●
Transit	Does the proposed design provide transit only lanes, queue jumps, in-lane/far-side bus stops, and other design features that allow for improved bus speed and reliability?	◐
	Does it allow for the inclusion of TSP in future detailed design?	●
Bicycle Connectivity	Does the design meet recommended bikeway type for speeds and volumes per DIB 94 Guidelines?	⊘
	Does the design align with recommendations in the Active South City Plan?	⊘
	Does the signal phasing and/or intersection treatments facilitate protected movements for bikes?	◐
Pedestrian Connectivity	Does the proposed design provide continuous sidewalks with recommended widths per General Plan corridor type?	●
	Does the design shorten crossing distances, provides advanced stop bars, implement LPIs at signals, and/or implement FHWA-aligned crossing treatments for uncontrolled crossings?	●
Safety	Does the design remove severe conflicts between road users?	●
	Does the design help slow/manage vehicle speeds?	●
	Does the design facilitate separating conflicts in time where signals are present?	●
	Does the design incorporate treatments to increase user attentiveness/awareness at locations with severe conflicts?	●

● - Meets metric

◐ - Partially meets metric

⊘ - Does not meet metric

Vehicle Capacity

There are no proposed changes to the number of vehicle lanes on Grand Avenue, and it can accommodate existing and future demand based on estimated capacity thresholds, as shown in **Table 4.1**.

Table 4.1 Existing and Future Forecasted Volumes

	Existing Volumes	Future Volumes	Capacity
Existing Condition	6,800	10,000	17,800
Proposed Alternative	6,800	10,000	17,800

Transit

Although this design does not propose dedicated transit lanes, it does provide in-lane, far-side bus stops which will support improved bus speed and reliability. Maintaining the capacity of the roadway means that we would not expect transit vehicles to experience additional delay or congestion compared to existing conditions. Consider upgrades to signals along the corridor to include Transit Signal Priority.

Bicycle Connectivity

The proposed Class IIB buffered bike lanes do not meet the recommended bikeway type based on speeds and volumes from DIB 94 and do not align with the recommendations in the Active South City Plan. However, the extension of the bikeway from Chestnut Avenue to Mission Road closes a gap in the existing bike network, and some changes to intersection configuration support more awareness and visibility for bikes.

Pedestrian Connectivity

The design provides shorter crossings through the introduction of bulb outs and adds marked crossings at several side-street, stop-controlled intersections with the appropriate countermeasures to support pedestrian safety.

Multimodal Safety

The Safe System Project-Based Alignment Framework found that the proposed design achieves an overall 28% reduction in fatal and injury crash risk for all users, with a 31% reduction for vulnerable road users and 17% reduction for motor vehicles.

Parking

The proposed design removes approximately 57 of the 334 existing on-street parking spaces along the corridor to accommodate bus boarding islands and bulb outs (17% reduction).

5. Spruce Avenue

5.1 Existing Conditions

Spruce Avenue is an arterial roadway with two distinct segments: the south segment runs from El Camino Real to Railroad Avenue and two vehicle lanes in each direction, the north segment connects from Railroad Avenue to Grand Avenue. The southern portion is formally named South Spruce Avenue (S Spruce). The southern portion, at El Camino Real, has shared lane bike markings and no parking, but includes a center-turning lane for the southernmost portion. SamTrans Route 141 runs from Huntington Avenue through the rest of the study space at 30-minute headways. Land uses around S Spruce are primarily industrial and commercial.

The northern end of Spruce spans from Railroad Avenue to Grand Avenue with two vehicle lanes and on-street parking on both sides of the street. The segment has shared lane bike markings. SamTrans Route 141 runs through this segment with low, to medium, density residential land-uses.

Previous Plans

Active South City Plan (2022): Spruce Avenue has level of traffic stress 4 with recommended Class IV protected bike lanes from El Camino Real to Railroad Avenue. The plan recommends specific intersection spot treatments at intersections with Baden Avenue, Commercial Avenue, North Canal Street, Huntington Avenue, and El Camino Real.

General Plan (2022): Spruce is characterized as a collector and a truck route without transit priority. Land use changes include varying residential with more medium-high density toward the downtown core.

Lindenville Specific Plan (2023): Proposed land uses are high-density mixed-use, and medium-density mixed-use, on the east and west sides, respectively. The plan establishes a Pedestrian Priority Street on S Spruce with 12-15' sidewalks, Class IV bike facilities, and a road diet with two lanes and center-turning lane along with other traffic calming.

Local Roadway Safety Plan (2022): Project recommendations for Spruce Avenue and North Canal Street include high-visibility crossings and signaling upgrades.

Speeds and Volumes

The posted speed along Spruce Avenue is 30 mph for the south segment and 25 mph for the north segment. 85th percentile vehicle speeds along the whole corridor are 33-37 mph. Average daily traffic volumes are estimated to be 7,900 and 20,400 for the north and south end, respectively.

Collision Analysis

Collision data from 2017 to 2022 reveals crash densities for all modes. A pedestrian fatality at the intersection with El Camino Real is accompanied by other pedestrian collisions. The corridor has instances of vehicle and bike collisions, including a severe vehicle crash.

Parking Occupancy

On-street parking occupancy collected on the northern segment from Railroad to Grand indicates extremely high parking usage for residents with almost full, or over full, capacity at the peak 8–9 PM period.

5.2 Design Considerations and Decisions

There are two alternatives for Spruce Avenue, which can be considered as a menu of treatments for three distinct sections:

- **El Camino Real to Mayfair Avenue:** Both alternatives advance the cross section recommended in the Lindenville Specific Plan, including directional Class IV separated bike facilities and a four-to-three road diet.
- **Mayfair to Railroad Avenue:** Alternative 1 proposes a shared use path on the east side of the street and Alternative 2 proposes directional Class IV bikeways.
- **Railroad to Grand Avenue:** Alternative 1 transitions bikes to a Class III Bike Route Grand and Alternative 2 transitions bikes to Class II bike lanes with parking removal on one side of the street.

The concepts for alternative 1 are shown in **Figure 5.1 – Figure 5.3** and the concepts for alternative 2 are shown in **Alternative 2: Corridor Treatments**

Bike Facilities: Alternative 2 shows directional separated bikeways at sidewalk level from El Camino Real to Mayfair, separated by a concrete or planted median. At Mayfair, the directional Class IV bike facilities continue, switching to bollard separation. Based on speed and volume data, these facilities align with DIB 94 bikeway selection and the recommendations in the Active South City Plan. The alternative transitions to Class II bike lanes from Railroad to Grand.

Pedestrian Facilities: Alternative 2 proposes wider sidewalks from El Camino Real to Mayfair Avenue, where the sidewalk transitions to a shared use facility. North of Railroad, the design transitions back to the existing sidewalk facilities.

Transit Facilities: There are no proposed dedicated transit facilities along Spruce Avenue, but stops are upgraded to in-lane, far-side stops where possible.

Vehicle Lanes: Alternative 2 advances the recommendations from the Lindenville Specific Plan, implementing a four-to-three lane road diet from El Camino to Railroad and maintains the existing two-lane configuration from Railroad to Grand.

Parking: Alternative 2 removes parking on the west side of Spruce Avenue from Railroad to Grand Avenue.

Alternative 2: Intersection Treatments

For intersections of El Camino Real through Starlite Street, see alternative 1.

Mayfair Avenue, S Canal Street, and N Canal Street: These three tightly spaced intersections create a challenging and constrained section of the corridor. Mayfair and N Canal remain signalized, and a new Pedestrian Hybrid Beacon is introduced at S Canal to facilitate crossings to and from the Sister Cities Park trail. As part of future detailed engineering analysis evaluate how these signals can be coordinated. North of N Canal, the southbound bus stop is a shared bike lane and bus pull out due to

constrained condition through this section. Future detailed engineering design may consider redistributing the space between the northbound and southbound stops to accommodate a shared bus/bike platform:

Shared Bike/Bus Platform

This design has significant accessibility and waiting environment trade offs and should be reserved for constrained conditions.

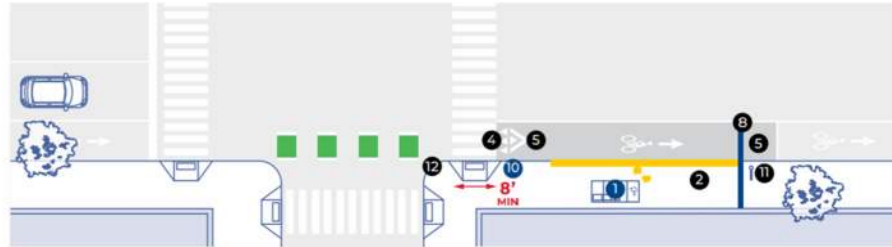


Figure 5.4: Shared Bike/Bus Platform (SamTrans Bus Stop Design Guide)

Railroad Avenue: Upgrade crosswalks to high visibility crossings. Maintain the existing northbound lane configuration, with northbound bike lane to the right of the right turn only lane. The conflict between northbound bikes and right turning vehicles must be separated in time, using a right turn arrow signal head and bike signal head. Permissive southbound left turn movements may also present a safety challenge for people walking and biking. Consider a bike and pedestrian scramble phase.

1st Lane, 2nd Lane, and 3rd Lane: Install high visibility crossings and advanced stop bars.

Commercial Avenue and Baden Avenue: Upgrade crosswalks to high visibility crossings, install bulb outs, and install advanced stop bars.

Grand Avenue: Conform design to the design for Grand Avenue. Install a bike box for northbound bikes to facilitate left-turn access to bike facilities on Grand Avenue.

Figure 5.5 – Figure 5.7.

Design Vehicle: Spruce Avenue is on the city truck network and is designed to accommodate a WB-67 along the corridor and for turns at intersecting truck routes (El Camino Real, Huntington Avenue, and Victory Avenue). At other intersections, the design vehicle for turn movements is an SU-30 truck.

Alternative 1: Corridor Treatments

Bike Facilities: Alternative 1 shows directional separated bikeways at sidewalk level from El Camino Real to Mayfair, separated by a concrete or planted median. At Mayfair, bikes transition to a shared use path on the east side of the street where there are fewer driveway conflicts compared to the west side. Based on speed and volume data, these facilities align with DIB 94 bikeway selection and the recommendations in the Active South City Plan. The alternative transitions to a Class III bike route which does not meet the recommended bike facilities from DIB 94 but does align with the Active South City Plan.

Pedestrian Facilities: Alternative 1 proposes wider sidewalks from El Camino Real to Mayfair Avenue, where the sidewalk transitions to a shared use facility. North of Railroad, the design transitions back to the existing sidewalk facilities.

Transit Facilities: There are no proposed dedicated transit facilities along Spruce Avenue, but stops are upgraded to in-lane, far-side stops where possible.

Vehicle Lanes: Alternative 1 advances the recommendations from the Lindenville Specific Plan, implementing a four-to-three lane road diet from El Camino to Railroad and maintains the existing two-lane configuration from Railroad to Grand.

Parking: This alternative does not impact parking except to introduce bulb outs and daylighting at intersections.

Alternative 1: Intersection Treatments

El Camino Real: Maintain the existing southbound lane configuration (left turn, through-left, and right-turn lane). Due to constrained conditions on the north leg, consider a mixing zone for bikes and pedestrians before transitioning to a dedicated bike and pedestrian facility.

Terrace Dr/Huntington Drive: Upgrade all crosswalks to high visibility crossings. Add green cross bike markings to connect the Class IV bike lanes through the intersection. Provide exclusive left-turn lanes on the main line. Consider curb extensions or refuge areas to reduce pedestrian crossing distances. Retain traffic signal control and incorporate bicycle detection where feasible. Consider separated bike phases and no right turn on red along Spruce.

Centennial Way Trail Crossing: Maintain pedestrian signal at the intersection. Introduce a wide mountable median to serve as a refuge island. Introduce a second high visibility shared-use crossing to facilitate easy access from both sides of the trail crossing. Note that the existing driveways would become right-in right-out access only.

Myrtle Avenue: Upgrade crossing on the side street to a high visibility crosswalk with cross-bike markings. Add bulb outs to reduce crossing distance and improve sightlines. Add green cross bike markings to connect the Class IV bike lanes through the intersection.

Victory Avenue: Upgrade crossings to high visibility crossings. Close the northbound and eastbound right turn slip lanes and introduce bulb outs. Retain traffic signal control and incorporate bicycle detection where feasible. Consider separated bike phases and no right turn on red along Spruce.

Starlight Street: Upgrade crossing on the side street to a high visibility crosswalk with cross-bike markings. Add bulb outs to reduce crossing distance and improve sightlines. Maintain through Class II bike lanes with green conflict striping across the intersection.

Mayfair Avenue, S Canal Street, and N Canal Street: These three tightly spaced intersections create a challenging and constrained section of the corridor. At Mayfair, the bike facilities transition from Class IV to Class I, using mixing zones and high visibility crossings to facilitate access to the appropriate side of the street. At S Canal Street, the Sister Cities Park trail T's into Spruce on the opposite side of the street. A Pedestrian Hybrid Beacon supports bike and pedestrian crossings to/from the trail, with a shared bike and pedestrian space on the west side of the street so that southbound bikes do not need to cross twice. At N Canal Street, bikes may continue along the shared use path. Coordinate the signal and include no right turn on red indications for northbound Spruce.

Railroad Avenue: Upgrade crosswalks to high visibility crossings. Transition northbound bikes to the Class III shared lanes using sharrow markings. Southbound bikes will have to access the trail either by behaving as a left-turning vehicle (yielding to northbound traffic) or as a pedestrian (two stage crossing). Use signal phasing to separate the northbound right turn movement from the east leg pedestrian phase.

1st Lane, 2nd Lane, and 3rd Lane: Bring the pedestrian crossings up to sidewalk level to slow vehicle speeds.

Commercial Avenue and Baden Avenue: Upgrade crosswalks to high visibility crossings, install bulb outs, and install advanced stop bars.

Grand Avenue: Conform design to the design for Grand Avenue and Downtown.

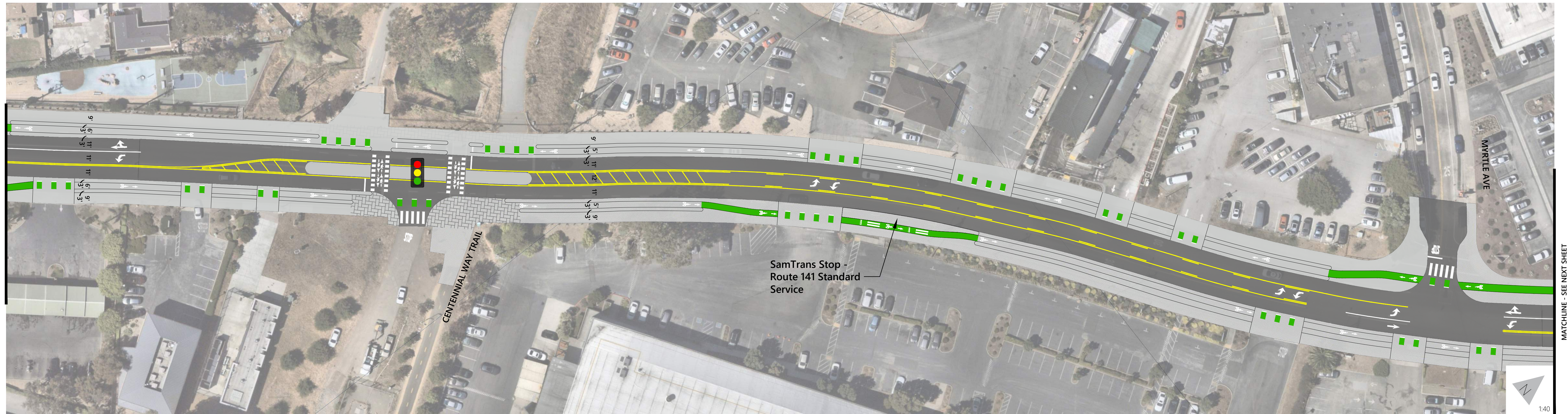
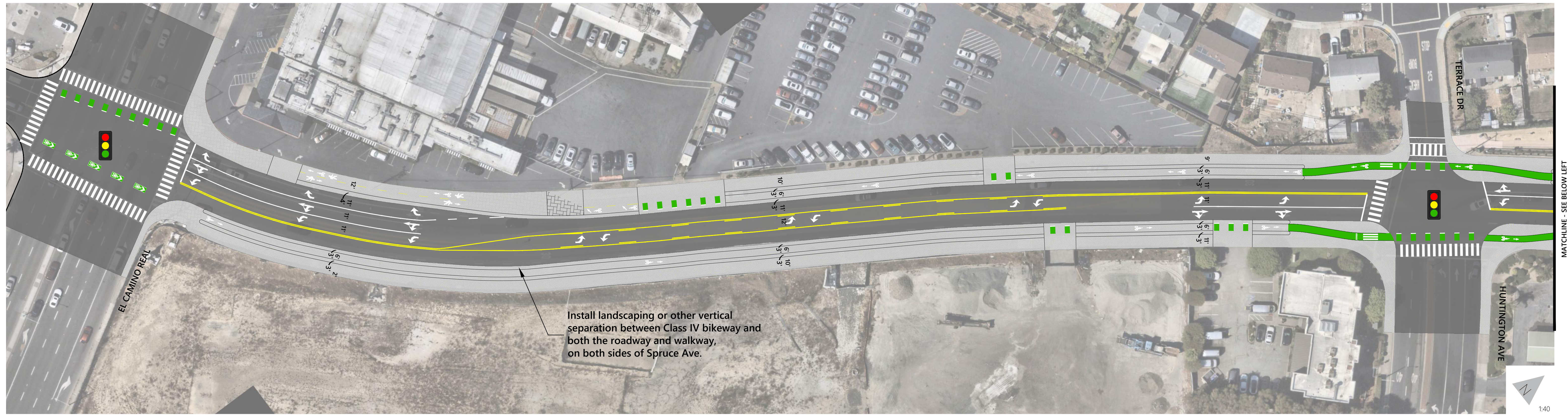
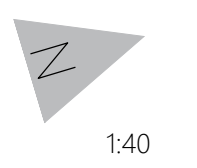
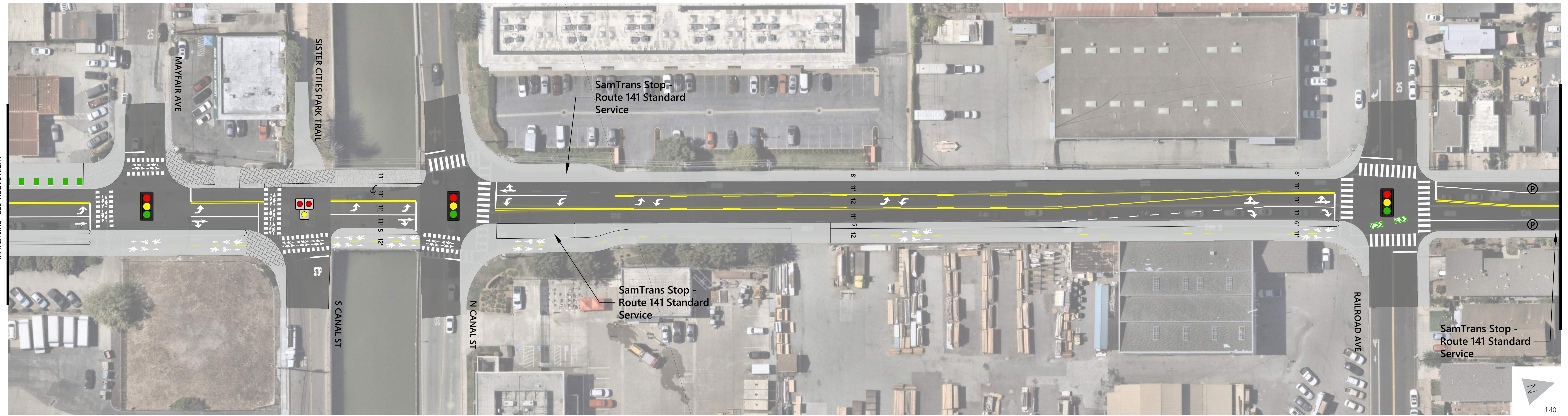
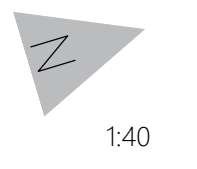
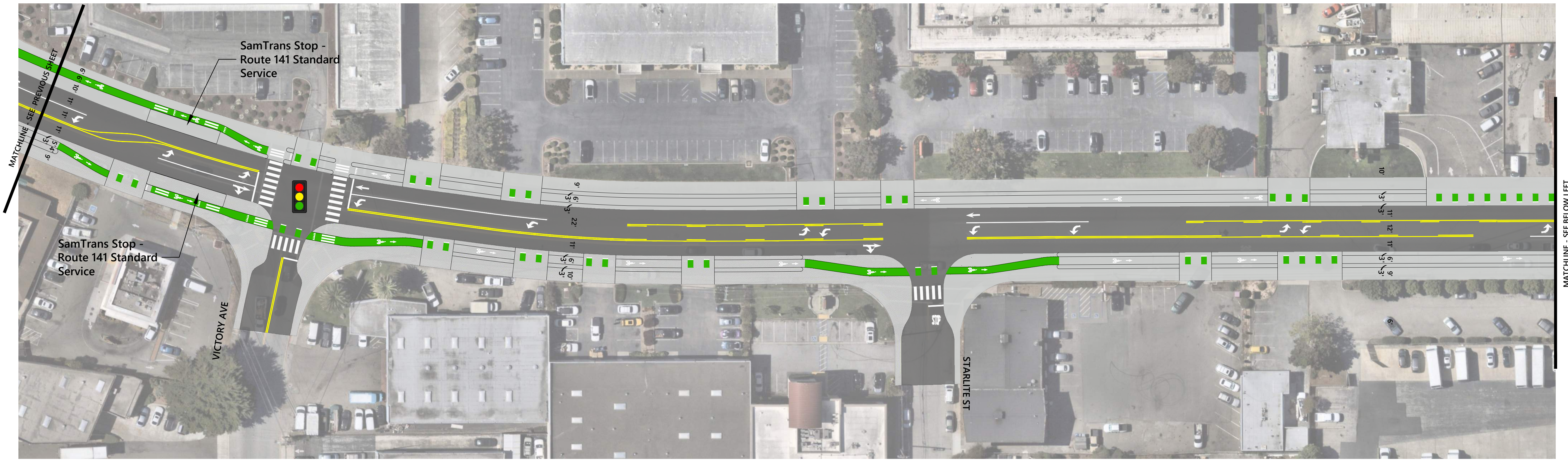


Figure 5.1 - Spruce Avenue
 Alternative 1 - Lindenville Cross-Section and Pedestrian Safety Improvements
 South San Francisco WEST 101 Complete Streets



CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

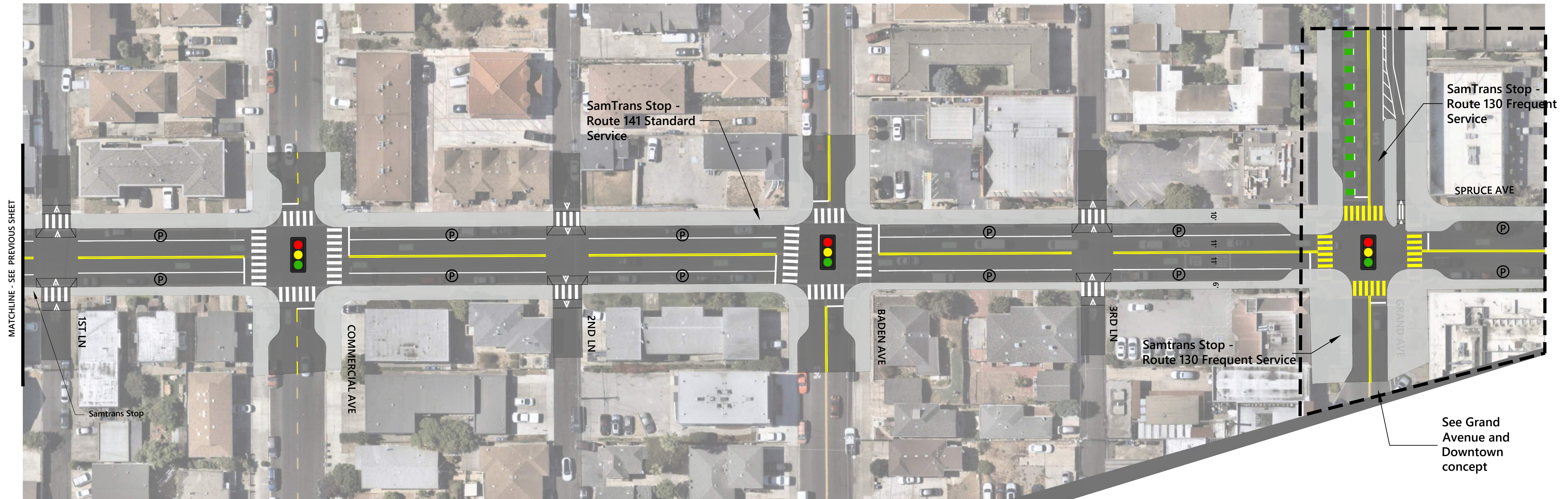
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CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 5.2 - Spruce Avenue
Alternative 1 - Lindenville Cross-Section and Pedestrian Safety Improvements
South San Francisco WEST 101 Complete Streets

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CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 5.3 - Spruce Avenue
Alternative 1 - Lindenville Cross-Section and Pedestrian Safety Improvements
South San Francisco WEST 101 Complete Streets

Alternative 2: Corridor Treatments

Bike Facilities: Alternative 2 shows directional separated bikeways at sidewalk level from El Camino Real to Mayfair, separated by a concrete or planted median. At Mayfair, the directional Class IV bike facilities continue, switching to bollard separation. Based on speed and volume data, these facilities align with DIB 94 bikeway selection and the recommendations in the Active South City Plan. The alternative transitions to Class II bike lanes from Railroad to Grand.

Pedestrian Facilities: Alternative 2 proposes wider sidewalks from El Camino Real to Mayfair Avenue, where the sidewalk transitions to a shared use facility. North of Railroad, the design transitions back to the existing sidewalk facilities.

Transit Facilities: There are no proposed dedicated transit facilities along Spruce Avenue, but stops are upgraded to in-lane, far-side stops where possible.

Vehicle Lanes: Alternative 2 advances the recommendations from the Lindenville Specific Plan, implementing a four-to-three lane road diet from El Camino to Railroad and maintains the existing two-lane configuration from Railroad to Grand.

Parking: Alternative 2 removes parking on the west side of Spruce Avenue from Railroad to Grand Avenue.

Alternative 2: Intersection Treatments

For intersections of El Camino Real through Starlite Street, see alternative 1.

Mayfair Avenue, S Canal Street, and N Canal Street: These three tightly spaced intersections create a challenging and constrained section of the corridor. Mayfair and N Canal remain signalized, and a new Pedestrian Hybrid Beacon is introduced at S Canal to facilitate crossings to and from the Sister Cities Park trail. As part of future detailed engineering analysis evaluate how these signals can be coordinated. North of N Canal, the southbound bus stop is a shared bike lane and bus pull out due to constrained condition through this section. Future detailed engineering design may consider redistributing the space between the northbound and southbound stops to accommodate a shared bus/bike platform:

Shared Bike/Bus Platform

This design has significant accessibility and waiting environment trade offs and should be reserved for constrained conditions.

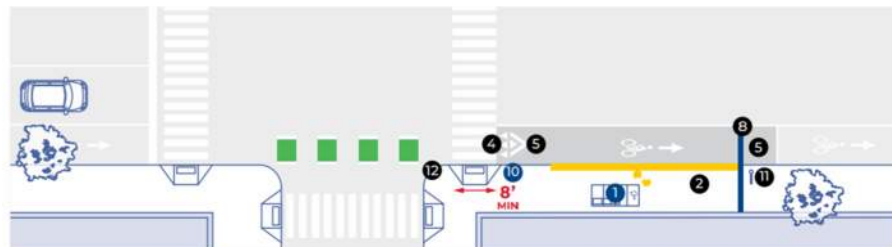


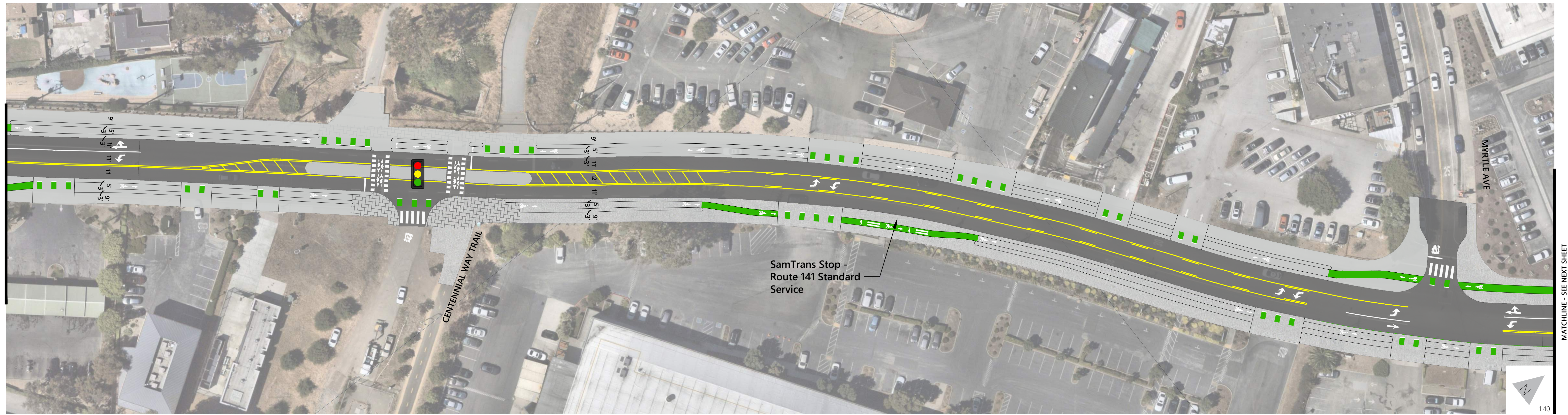
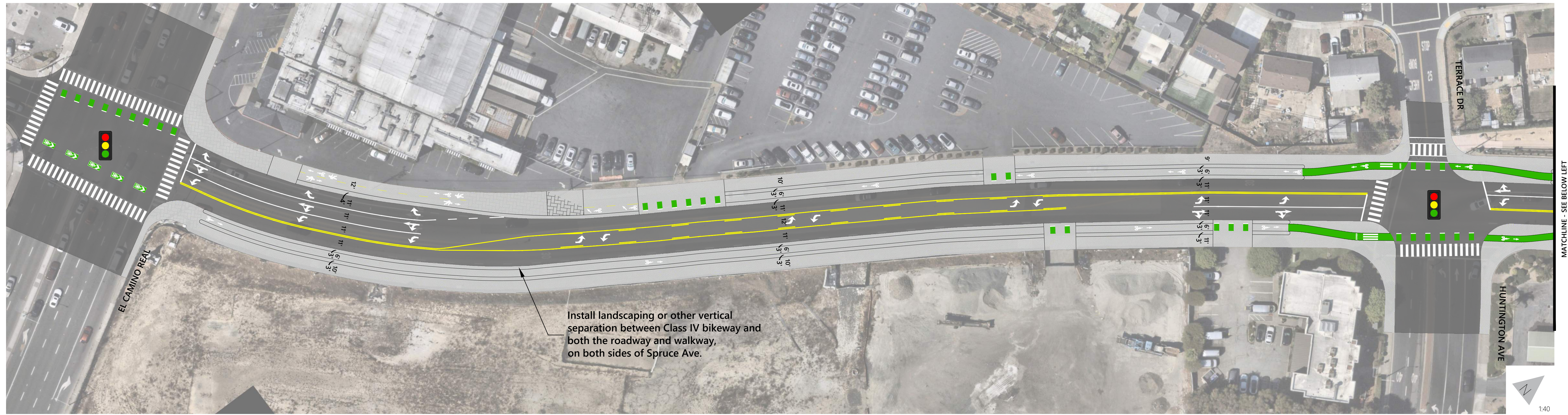
Figure 5.4: Shared Bike/Bus Platform (SamTrans Bus Stop Design Guide)

Railroad Avenue: Upgrade crosswalks to high visibility crossings. Maintain the existing northbound lane configuration, with northbound bike lane to the right of the right turn only lane. The conflict between northbound bikes and right turning vehicles must be separated in time, using a right turn arrow signal head and bike signal head. Permissive southbound left turn movements may also present a safety challenge for people walking and biking. Consider a bike and pedestrian scramble phase.

1st Lane, 2nd Lane, and 3rd Lane: Install high visibility crossings and advanced stop bars.

Commercial Avenue and Baden Avenue: Upgrade crosswalks to high visibility crossings, install bulb outs, and install advanced stop bars.

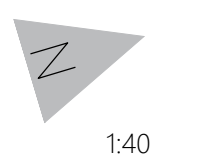
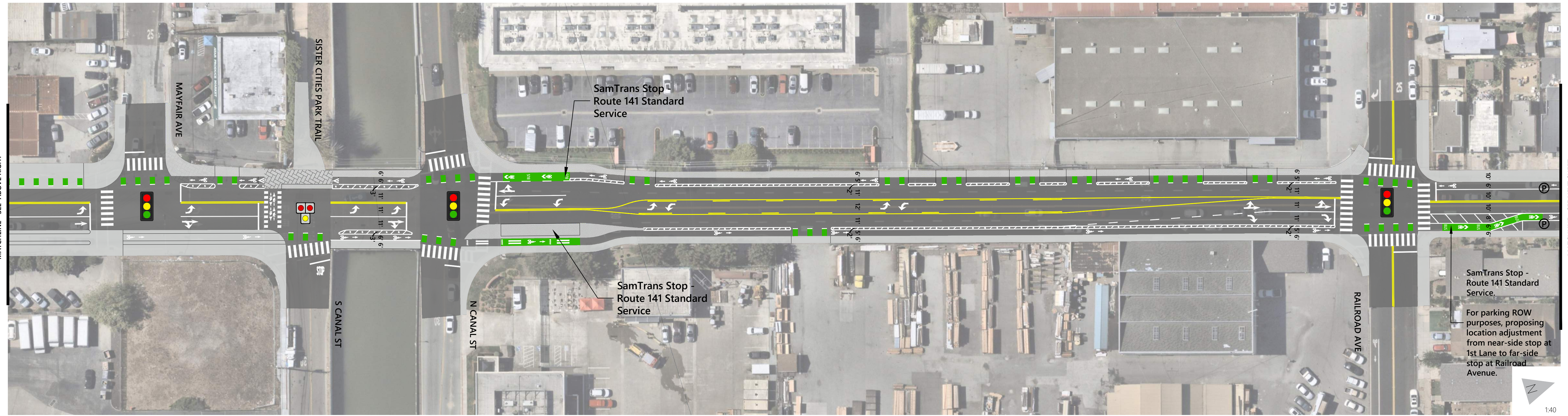
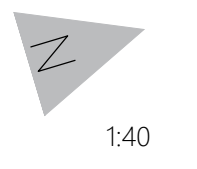
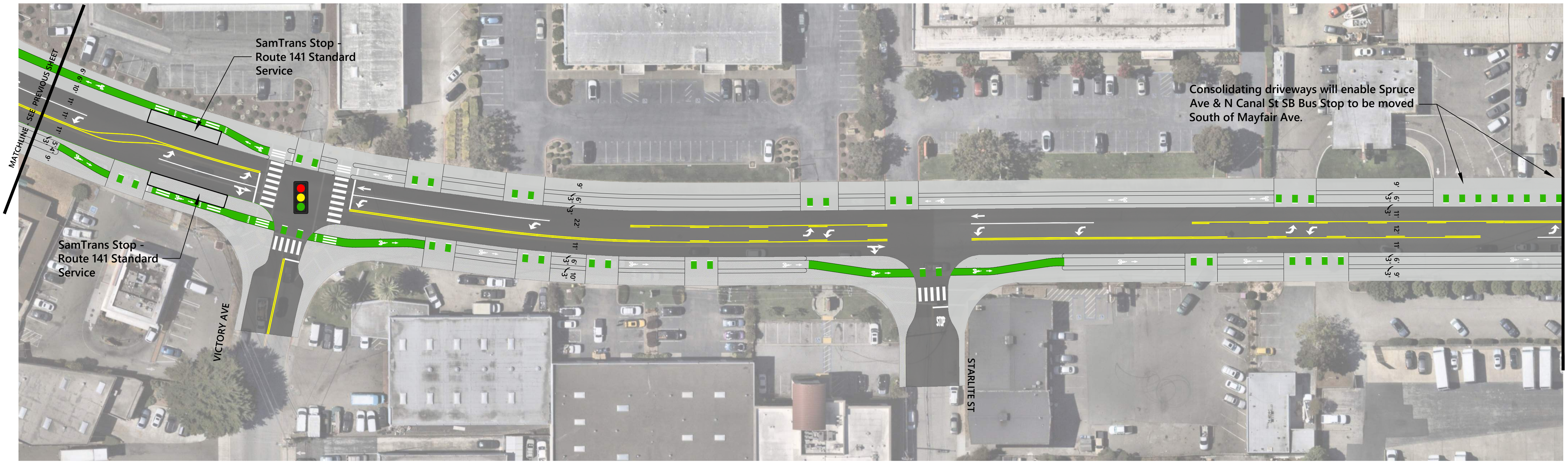
Grand Avenue: Conform design to the design for Grand Avenue. Install a bike box for northbound bikes to facilitate left-turn access to bike facilities on Grand Avenue.



CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 5.5 - Spruce Avenue
 Alternative 2 - Alternative 1 with Bike Lanes to Grand Avenue
 South San Francisco WEST 101 Complete Streets

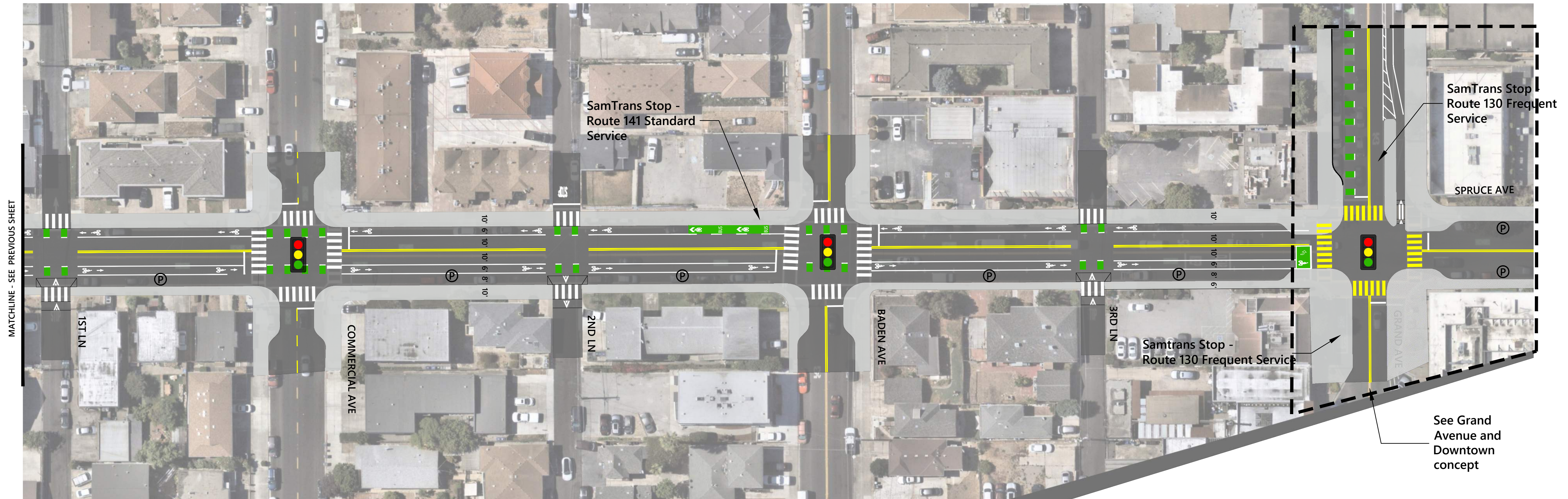
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CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 5.6 - Spruce Avenue
Alternative 2 - Alternative 1 with Bike Lanes to Grand Avenue
South San Francisco WEST 101 Complete Streets

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CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 5.7 - Spruce Avenue
Alternative 2 - Alternative 1 with Bike Lanes to Grand Avenue
South San Francisco WEST 101 Complete Streets

5.3 Design Evaluation

Corridor		Alternative 1	Alternative 2
Category	Metric		
Vehicle Operations	Does the proposed design support existing volumes compared to planning-level volume thresholds?	●	●
	Does the proposed design accommodate future forecasted volumes along the corridor?	⊘	⊘
Transit	Does the proposed design provide transit only lanes, queue jumps, in-lane/far-side bus stops, and other design features that allow for improved bus speed and reliability?	⊘	⊘
	Does it allow for the inclusion of TSP in future detailed design?	●	●
Bicycle Connectivity	Meets recommended bikeway type for speeds and volumes per NACTO Guidelines	◐	●
	Meets recommendations in the Active South City Plan	●	●
	Signal phasing and intersection treatments facilitate protected movements for bikes	●	●
Pedestrian Connectivity	Provides continuous sidewalks with recommended widths per General Plan corridor type	●	●
	Shortens crossing distances, provides advanced stop bars, LPIs at signals, or other FHWA-aligned crossing treatments for uncontrolled crossings	●	●
Safety	Removes severe conflicts between road users	●	●
	Helps slow/manage vehicle speeds	◐	●
	Facilitates separating conflicts in time where signals are present	●	●
	Incorporates treatments to increase user attentiveness/awareness at locations with severe conflicts	◐	●

● - Meets metric

◐ - Partially meets metric

⊘ - Does not meet metric

Vehicle Capacity

Both alternatives maintain the vehicle capacity north of Railroad and introduce a road diet between El Camino Real and Railroad (southern segment). The proposed design can accommodate the existing volumes for both segments. Future forecasted volumes may exceed the capacity for the road-dieted portion in horizon year 2040. However, designing to encourage and enable convenient, safe travel by walking and biking may reduce the actual future vehicle demand for Spruce.

	Northern Segment			Southern Segment		
	Existing Volumes	Future Volumes	Capacity	Existing Volumes	Future Volumes	Capacity
Existing Condition	7,900	11,850	17,800	20,400	30,600	36,000
Proposed Alternative 1	7,900	11,850	17,800	20,400	30,600	25,000
Proposed Alternative 2	7,900	11,850	17,800	20,400	30,600	25,000

Transit

The proposed designs include in-lane bus stops, moving to the far side where feasible. There are no dedicated transit facilities, and the proposed road diet may cause transit travel times to increase with the associated decrease in vehicle speeds along the roadway. The Lindenville Specific Plan designates Spruce Avenue as a pedestrian and bicycle priority route, so the trade-off of potentially slower transit services aligns with the long-range planning for the subarea.

Bicycle Connectivity

Alternative 1: The proposed Class IV and Class I facilities from El Camino Real to Railroad Avenue meet the recommended bikeway type based on speeds and volumes from DIB 94 and align with the recommendations in the Active South City Plan. This project has not evaluated detailed signal phasing, but we assume protected left turn phasing and LPIs will be implanted to reduce the frequency and severity of conflicts between vehicles and bicycles and pedestrians. The Class III facilities from Railroad to Grand are not aligned with the existing vehicle volumes along Spruce Ave which calls for a Class IV or Class I facility.

Alternative 2: Like Alternative 1, the Class IV bikeway from El Camino Real to Railroad Ave meet the recommended bikeway type and align with the recommendations in the Active South City Plan. The Class II facilities north of Railroad Ave, while providing dedicated space for bikes, does not align with the Class IV facilities based upon speeds and volumes; however, Class II is an improvement over Class III facility.

Pedestrian Connectivity

Both alternatives propose wider and continuous sidewalks along Spruce Avenue, with intersection treatments such as bulb outs, high visibility crosswalks, and advanced stop/yield markings to improve

the comfort of pedestrians. Update signal phasing to include leading pedestrian intervals for all crossings.

Multimodal Safety

Alternative 1: The Safe System Project-Based Alignment Framework found that the proposed design achieves a 22% reduction in fatal and injury crash risk for all users, with a 22% reduction for vulnerable road users and 20% reduction for vehicles.

Alternative 2: The Safe System Project-Based Alignment Framework found that the proposed design achieves an overall 22% reduction in fatal and injury crash risk for all users, with a 59% reduction for vulnerable road users and 18% reduction for motor vehicles.

Parking:

Alternative 1: Alternative 1 does not remove any on-street parking spaces.

Alternative 2: Alternative 2 removes all on-street parking on the west side of the street, from Railroad Ave to Grand Avenue, approximately 19 of the existing 43 spaces (44% reduction).

6. Orange Avenue

6.1 Existing Conditions

Orange Avenue is a two-lane local street with study extents from El Camino Real to Grand Avenue. The street includes a Class II bike facility from Railroad Avenue to Centennial Way Trail, and shared lane markings within the remaining study area. SamTrans services Orange with Route 37 (school-oriented) and the SSF Shuttle running counter-clockwise at 40-minute headways. The street has on-street parking on both sides with low to medium density residential, Orange memorial park, and Los Cerritos Elementary School.

Previous Plans

Active South City Plan (2022): Orange Avenue has a level of traffic stress 3 and recommends Class IIIB bike boulevard facilities for most of the corridor with Class IIB adjacent to Orange Memorial Park. The plan recommends specific intersection spot treatments at intersections with Baden Avenue, Railroad Avenue, A Street, B Street, C Street, and El Camino Real.

General Plan (2022): Orange is characterized as a collector without transit priority, and not a truck route. Land uses are planned to change toward medium-high density residential toward downtown and lower density near Orange Memorial Park.

Speeds and Volumes

The posted speed on Orange Avenue is 25 mph with 85th percentile vehicle speeds measured to be 33 mph. Estimated daily average traffic is 8,600 vehicles per day.

Collision Analysis

Collision data from 2017 to 2022 reveals crashes primarily at intersections with El Camino Real including a severe pedestrian crash. Vehicle and pedestrian collisions are reported across the corridor with a bike collision at the crossing with Centennial Way Trail.

Parking Occupancy

On-street parking occupancy varies across the corridor with nearly full capacity at both 11-1 PM and 8-9 PM peak periods from Railroad to Grand and A to C. C to Railroad reaches 75% capacity at select blocks for the 8-9 PM Peak period with some adjacent blocks at 17% capacity.

6.2 Design Considerations and Decisions

There are two alternatives for West Orange which may be treated as a menu of options for the three distinct segments of the corridor:

- **El Camino Real to Memorial Drive:** Both alternatives recommend maintaining the existing configuration with some traffic calming features to support bike and pedestrian comfort.
- **Memorial Drive to Circle Court/Railroad Ave:** Alternative 1 recommends maintaining the existing configuration and upgrading the bike facilities to Class IIB buffered bike lanes. Alternative 2

recommends continuing the Class III bike route with traffic calming features at intersections, in addition to a parallel shared use path along the west side of the street, and introducing back-in angled parking adjacent to Orange Memorial Park.

- **Circle Court/Railroad Ave to Grand Avenue:** Alternative 1 recommends Class II bike lanes with parking removal on the west side of the street and Alternative 2 recommends a continuation of the Class III bike route with a menu of potential traffic calming features.

Design Vehicle: Orange Avenue is not on the truck network. The design vehicle for travel along Orange Avenue is a SamTrans 40' bus. The design vehicle for turns on and off Orange Avenue is a SU-30 truck.

Alternative 1: Corridor Treatments

Bike Facilities: Alternative 1 seeks to introduce a Class II facility for as much of the corridor as possible, which is somewhat aligned with the speeds and volumes along the corridor. A Class IV facility would be most appropriate but cannot be accommodated without removing all or most on-street parking along the corridor; this option was removed from consideration based on direction from city staff and their understanding of community needs and priorities. The design maintains the existing shared lane markings from El Camino Real to Memorial Drive before transitioning to Class IIB buffered bike lanes along the park and Class II bike lanes from Railroad Avenue to Grand Avenue.

Pedestrian Facilities: Pedestrian facilities remain mostly the same, with some enhancements to crossings and the introduction of some new crossings.

Transit Facilities: The transit operating on Orange is low-frequency shuttle and special school service. In alignment with the SamTrans bus stop design guides, bus stops upgrades are not included.

Vehicle Lanes: No changes to vehicle lane configurations, narrow lane widths to 11 feet.

Parking: On-street parking is removed along the west side of the street from Railroad Avenue to Grand Avenue.

Alternative 1: Intersection Treatments:

A Street, B Street, and C Street: Install raised intersections and bulb outs to serve as traffic calming and increase comfort for school crossings.

Centennial Way Trail/Memorial Drive: Install a raised crossing for the Centennial Way Trail and across Memorial. Remove the southbound right turn lane to allow bike facilities to continue to the intersection, and install green-backed sharrows to support the transition for southbound bikes from Class II to Class III facilities.

Myrtle Avenue: Upgrade crosswalks to high visibility crossings, install bulb outs and advanced stop bars.

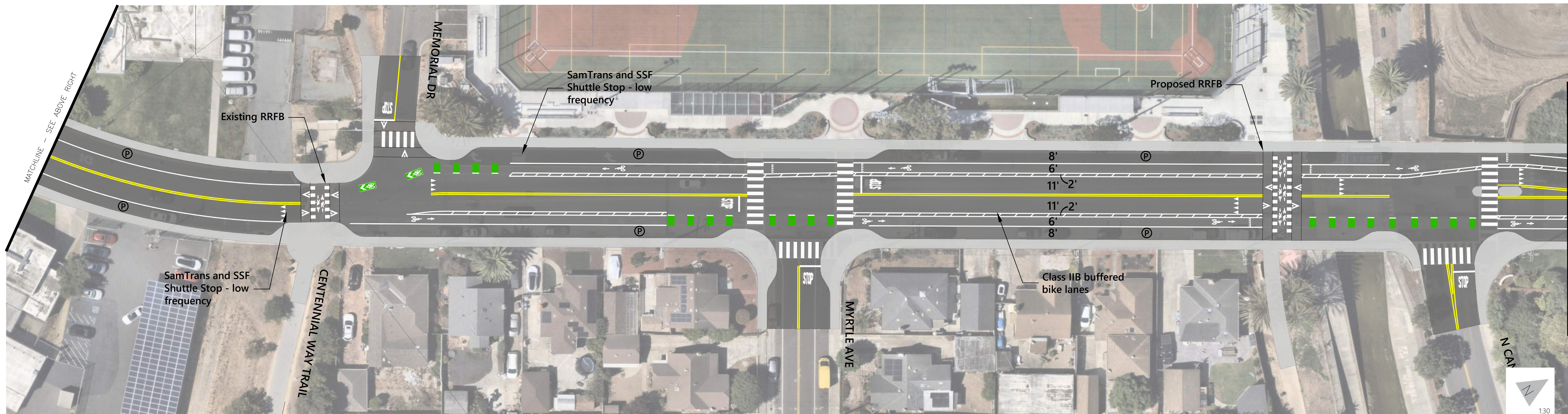
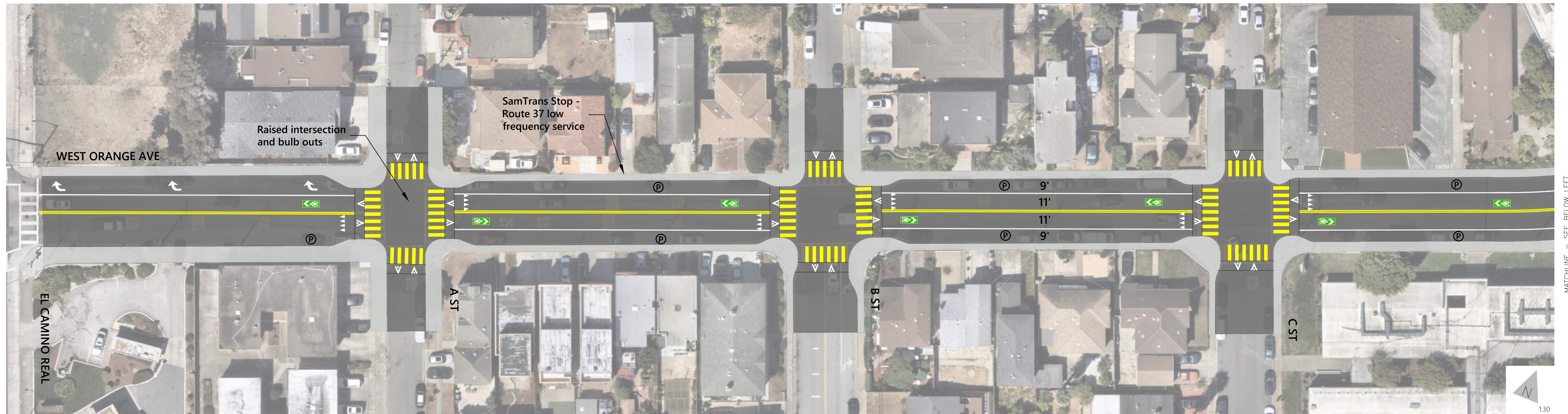
Sister Cities Park Trail and N. Canal: Install a new shared-use raised crossing aligned with the trail connection. Consider installing a Rectangular rapid flashing beacon. At N. Canal, install bulb outs and high visibility crossings.

Tennis Drive and Circle Court/Railroad Avenue: Use curb extensions to encourage a perpendicular alignment at Tennis Drive. Maintain a shared bike lane and bus pull out for northbound buses. Upgrade crosswalks to high visibility markings and install advanced stop bars/yield markings.

1st Lane, 2nd Lane, and 3rd Lane: Bring crossings to sidewalk level and consider high visibility markings.

Commercial Avenue and Baden Avenue: Upgrade crosswalks to high visibility crossings, install bulb outs and advanced stop bars.

Grand Avenue: Conform to designs on Grand Avenue. Include a bike box across the northbound left and right turn lanes to facilitate access to Grand from Spruce.



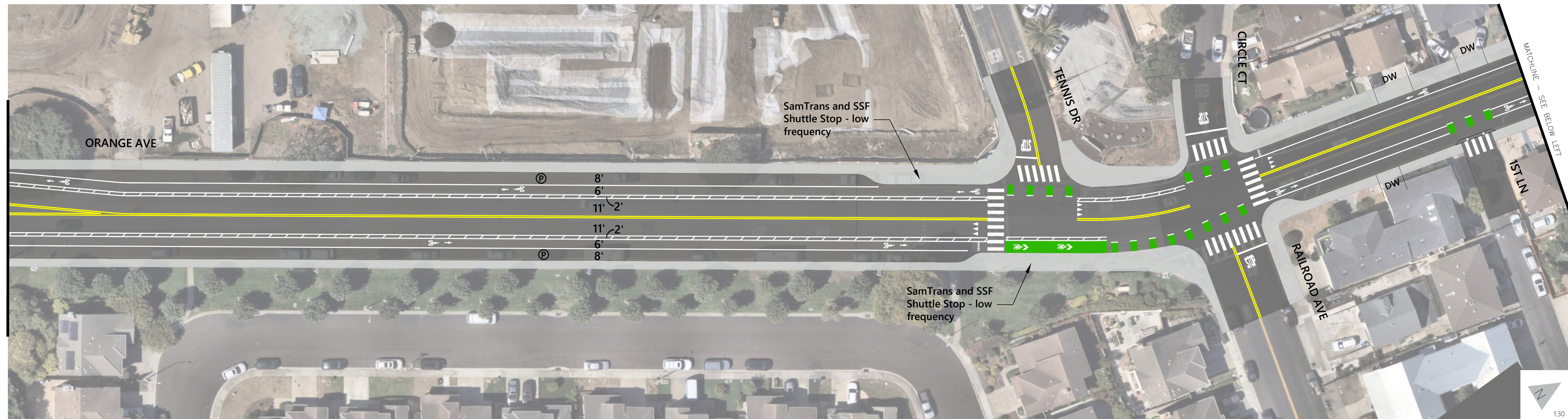
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Figure 6.1 - Orange Avenue

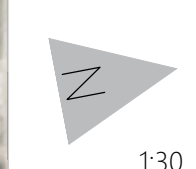
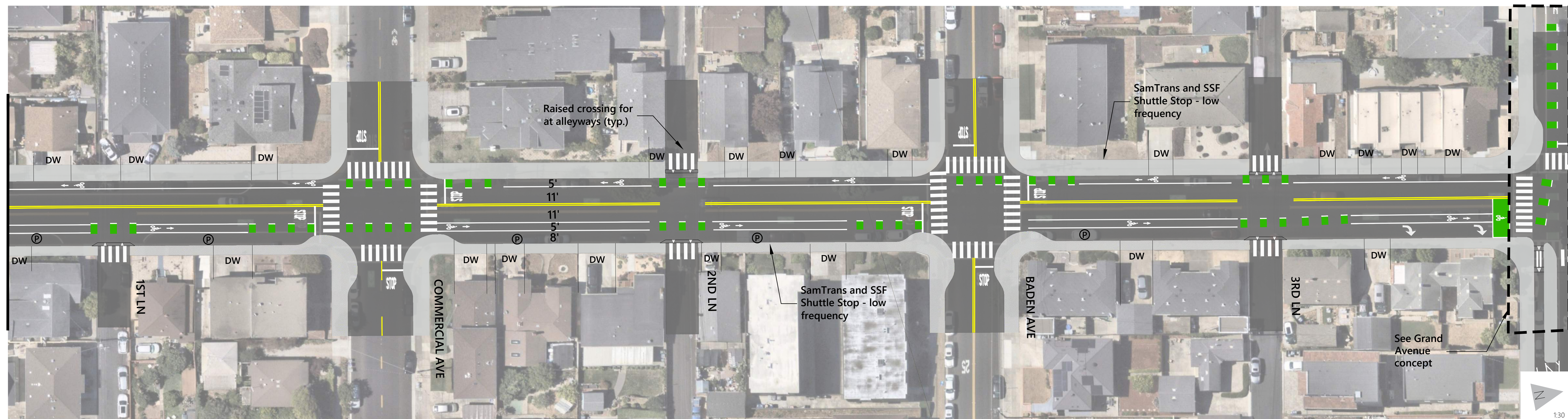
Alternative 1
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DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 6.2 - Orange Avenue

Alternative 1
South San Francisco East 101 Complete Streets

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Alternative 2: Corridor Treatments

Bike Facilities: Alternative 2 maintains a continuous Class III facility along the corridor, although speeds and volumes along Orange warrant bike facilities with a higher degree of separation from vehicles. It is critical to manage vehicle speeds in order to improve the comfort for people on bikes. In addition to the Class III facilities, a Class I shared use path is proposed on the west side of the street along the Orange Memorial Park, creating a north/south connection between the Centennial Way Trail and the Sister Cities Park Trail. The design also proposes frequent traffic calming features to support slower vehicle speeds that are better suited for shared lane conditions.

Pedestrian Facilities: Pedestrian facilities remain mostly the same, with some enhancements to crossings and the introduction of some new crossings.

Transit Facilities: The transit operating on Orange is low-frequency shuttle and special school service. In alignment with the SamTrans bus stop design guides, bus stops upgrades are not warranted.

Vehicle Lanes: Convert parallel parking to back-in angled parking from Memorial Drive to Tennis Drive. Narrow lanes to 11 feet.

Parking: On-street parking is removed along the west side of the street from Railroad Avenue to Grand Avenue.

Alternative 2: Intersection Treatments:

A Street, B Street, and C Street: Install raised intersections and bulb outs to serve as traffic calming and increase comfort for school crossings.

Centennial Way Trail/Memorial Drive: Install a raised crossing for the Centennial Way Trail and across Memorial. Install a traffic circle to serve as a Gateway entrance to the park area and provide a visual queue to drivers that this is a neighborhood street. Remove the southbound right turn lane to allow bike facilities to continue to the intersection.

Myrtle Avenue: Upgrade crosswalks to high visibility crossings, install bulb outs and advanced stop bars.

Sister Cities Park Trail and N. Canal: Install a raised shared-use crossing aligned with the trail connection. Consider installing a Rectangular Rapid Flashing Beacon. At N. Canal, install bulb outs and high visibility crossings. Where there is no parking proposed, consider a bioswale or other urban greening features.

Tennis Drive: Install a mini-roundabout with inscribed circular diameter of 70 feet and mountable splitter islands and central island.

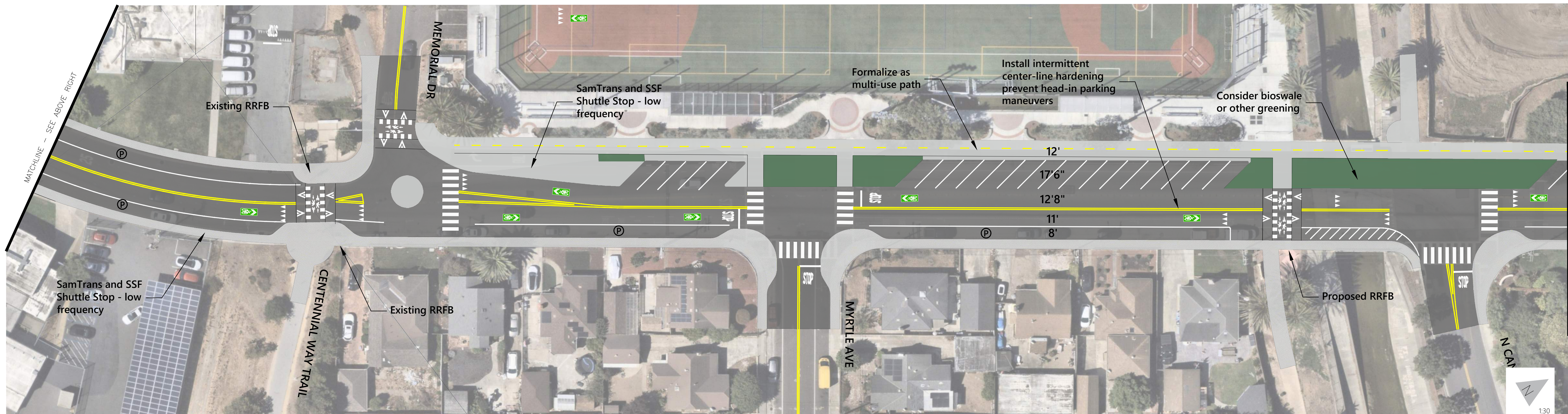
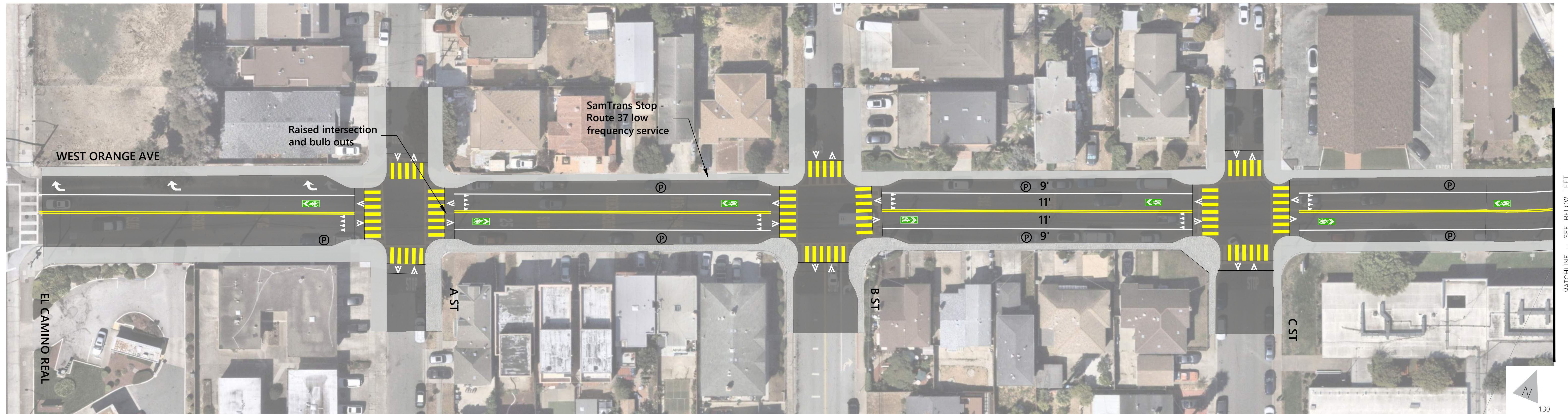
Circle Court: Install a traffic circle to serve as a gateway entrance to the park area and provide a visual queue for drivers that this is a neighborhood street.

1st Lane, 2nd Lane, and 3rd Lane: Bring crossings to sidewalk level and consider high visibility markings.

Commercial Avenue and Baden Avenue: Upgrade crosswalks to high visibility crossings and advanced stop bars. Several traffic calming features are shown in the concepts as a menu of options.

Consider applying one of the traffic calming configurations across all intersections: a textured intersection, pedestrian refuge islands, and/or a raised intersection.

Grand Avenue: Conform to designs on Grand Avenue.



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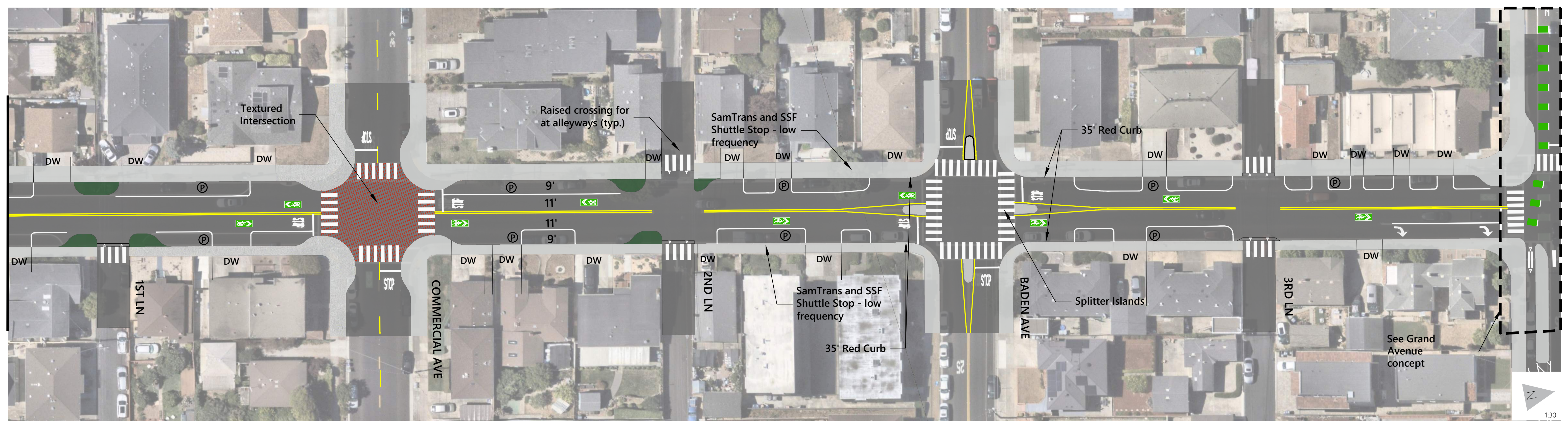
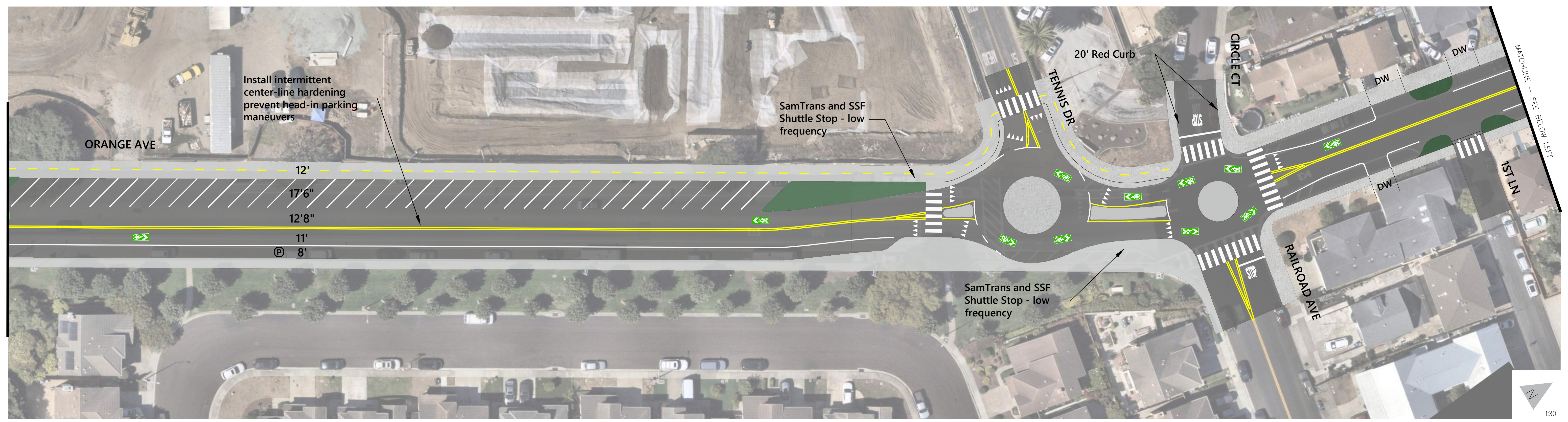
Figure 6.3 - Orange Avenue
Alternative 2
South San Francisco East 101 Complete Streets

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CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 6.4 - Orange Avenue
Alternative 2
South San Francisco East 101 Complete Streets

6.3 Design Evaluation

Corridor		Alternative 1	Alternative 2
Category	Metric		
Vehicle Operations	Does the proposed design support existing volumes compared to planning-level volume thresholds?	●	●
	Does the proposed design accommodate future forecasted volumes along the corridor?	●	●
Transit	Does the proposed design provide transit only lanes, queue jumps, in-lane/far-side bus stops, and other design features that allow for improved bus speed and reliability?	N/A	N/A
	Does it allow for the inclusion of TSP in future detailed design?	N/A	N/A
Bicycle Connectivity	Does the design meet recommended bikeway type for speeds and volumes per DIB 94 Guidelines?	⊘	◐
	Does the design align with recommendations in the Active South City Plan?	●	●
	Does the signal phasing and/or intersection treatments facilitate protected movements for bikes?	⊘	◐
Pedestrian Connectivity	Does the proposed design provide continuous sidewalks with recommended widths per General Plan corridor type?	●	●
	Does the design shorten crossing distances, provide advanced stop bars, implement LPIs at signals, and/or implement FHWA-aligned crossing treatments for uncontrolled crossings?	●	●
Safety	Does the design remove severe conflicts between road users?	◐	◐
	Does the design help slow/manage vehicle speeds?	◐	●
	Does the design facilitate separating conflicts in time where signals are present?	N/A	N/A
	Does the design incorporate treatments to increase user attentiveness/awareness at locations with severe conflicts?	◐	●

● - Meets metric

◐ - Partially meets metric

⊘ - Does not meet metric

Vehicle Capacity

The proposed design is expected to meet capacity needs for the corridor under the existing and future forecasted volumes.

	Existing Volumes	Future Volumes	Capacity
Existing Condition	8,600	12,300	17,800
Proposed Alternative 1	8,600	12,300	17,800
Proposed Alternative 2	8,600	12,300	17,800

Transit

Orange Avenue is not a transit priority corridor and only serves low frequency service. For this reason, the transit evaluation metrics are not applicable to the proposed alternatives.

Bicycle Connectivity

Alternative 1: Alternative 1 provides Class IIIB, Class IIB, and Class II facilities along the corridor, which align with the recommendations in the Active South City plan but do not meet the recommended facility type in DIB 94. The high volumes make a Class I or Class IV facility more appropriate, however, dedicated space for bikes is preferred over the existing Class III markings today. The design improves the safety of connections across Orange Ave for the Sister Cities Park Trail and the Centennial Way Trail.

Alternative 2: Alternative 2 provides a continuous Class IIIB bike boulevard along Orange Ave and a parallel Class I path along the west side between Memorial Drive and Circle Court. These facilities differ from the facilities proposed in the Active South City Plan but are somewhat aligned with the recommended facility type in DIB 94. The frequent traffic calming measures along the corridor will support speeds that complement a shared lane configuration. The Class I path provides a separated facility to connect between the Centennial Way Trail and the Sister Cities Park Trail.

Pedestrian Connectivity

Both alternatives maintain the existing continuous sidewalks along Orange Avenue, with intersection treatments such as bulb outs, high visibility crosswalks, and advanced stop/yield markings to improve the comfort of pedestrians.

Multimodal Safety

Alternative 1: The Safe System Project-Based Alignment Framework found that the proposed design achieves a 14% reduction in fatal and injury crash risk for all users, with a 13% reduction for vulnerable road users and 16% reduction for vehicles.

Alternative 2: The Safe System Project–Based Alignment Framework found that the proposed design achieves an overall 14% reduction in fatal and injury crash risk for all users, with a 11% reduction for vulnerable road users and 18% reduction for motor vehicles.

Parking

Alternative 1: Alternative 1 removes all on–street parking spaces along the west side of the street from Railroad Avenue to Grand Avenue, approximately 23 spaces. It would also remove approximately 8 spaces to accommodate bulb outs and other safety features. The total on–street parking loss is 31 spaces of the existing 154 (20%).

Alternative 2: Alternative 2 would increase the on–street parking supply along Memorial Park from approximately 39 to 60 spaces. It would also remove approximately 13 spaces to accommodate bulb outs and other safety features. The total increase in on–street parking is 7 spaces (5%).

7. Downtown

7.1 Existing Conditions

The downtown subarea is bounded by Miller Avenue to the north, Railroad Avenue to the south, Spruce Avenue to the west, and Linden Avenue to the east. There are existing Class III shared lane markings on Miller Avenue, Commercial Avenue, Spruce Avenue, Grand Avenue and Linden Avenue. The grid is a network of two-lane streets with on-street parking and one-way alleys that run east-west. Grand Avenue is the main street for commercial businesses and has front-in angled parking. SamTrans route 130 and 141 also run along Grand Avenue in addition to the SSF shuttles. Complete existing conditions information can be found in the Existing Conditions Summary included in **Attachment B**.

Previous Plans

Active South City Plan (2022): The plan recommends Class IIB bike facilities on Grand Avenue and Linden Avenue, maintaining the Class IIIB markings on Miller Avenue, Commercial Avenue, and Spruce Avenue.

General Plan (2022): No streets in the downtown subarea are on the truck route, and the streets are primarily identified as Existing Main Streets (collectors).

Grand Avenue Master Plan (2019): The Grand Avenue Master Plan developed recommendations for the street from Spruce to Airport Boulevard. The alternatives consistently recommend converting on-street parking along Grand Avenue from front-in angled to parallel parking to accommodate Class II bike lanes in addition to other streetscape and activation enhancements. This plan is regarded as an additional alternative to the two alternatives described below.

Speeds and Volumes

The posted speeds along the streets in the downtown subarea are all 25 mph. 2023 E&TS data found that 85th percentile speeds are between 23 and 34 mph, with the fastest speeds observed on Baden Avenue, Commercial Avenue, and Railroad Avenue. Bus speeds through downtown tend to be slow, between 3-12 mph.

Collision Analysis

There were been six pedestrian severe injuries, two bicycle severe injuries, and four vehicle severe injuries crashes from 2017 to 2022. The most commonly occurring collision type is broadside collisions, followed by vehicle-pedestrian and rear end collisions.

Parking Occupancy

On-street parking occupancy data was not collected for downtown as a part of this study.

7.2 Design Considerations and Decisions

There are two proposed alternatives for Downtown: Alternative 1 provides near-term quick build recommendations that can be implemented with temporary materials; and Alternative 2 proposes longer term improvements which would require changes to curb lines and more extensive roadway reconstruction.

Design Vehicle: The design vehicle for through and turning movements on the streets in downtown is an SU-30 truck. The design vehicle for travel along Grand Avenue is a SamTrans 40' bus.

Alternative 1: Corridor Treatments

Bike Facilities

- Grand Avenue: Maintain Class III shared lane markings
- Spruce Avenue: Maintain Class III shared lane markings
- Miller Avenue: Maintain Class III shared lane markings

Pedestrian Facilities: Alternative 1 does not propose changes to the existing sidewalks, but introduces bulb outs, high visibility crossings, and other safety enhancements throughout the subarea.

Transit Facilities: Alternative 1 proposes upgraded bus stops to in-lane and far-side stops where possible.

Vehicle Lanes: Alternative 1 maintains the vehicle lane configuration.

Parking: Convert on-street parking along Grand to back-in angled parking. The parking conversion may be implemented using striping and bollards.

Alternative 1: Intersection Treatments

Miller Avenue & Spruce Avenue, Walnut Avenue, Maple Avenue, and Linden Avenue: Install painted bulb outs. Consider additional treatments to enforce the turning radius such as rubber speed humps or armadillos (typical).

Grand Avenue & Spruce Avenue: Install painted bulb outs and conform to the designs for Grand Avenue west of the intersection and Spruce Avenue south of the intersection.

Grand Avenue & Walnut Avenue: No changes, but consider installing all-way stop-control if warrants are met.

Grand Avenue & Maple Avenue, Linden Avenue, and Cypress Avenue: Install painted bulb outs. Consider additional treatments to enforce the turning radius such as rubber speed humps or armadillos. Continue treatments to Airport Boulevard to connect to the existing protected intersection and connection under Caltrain.

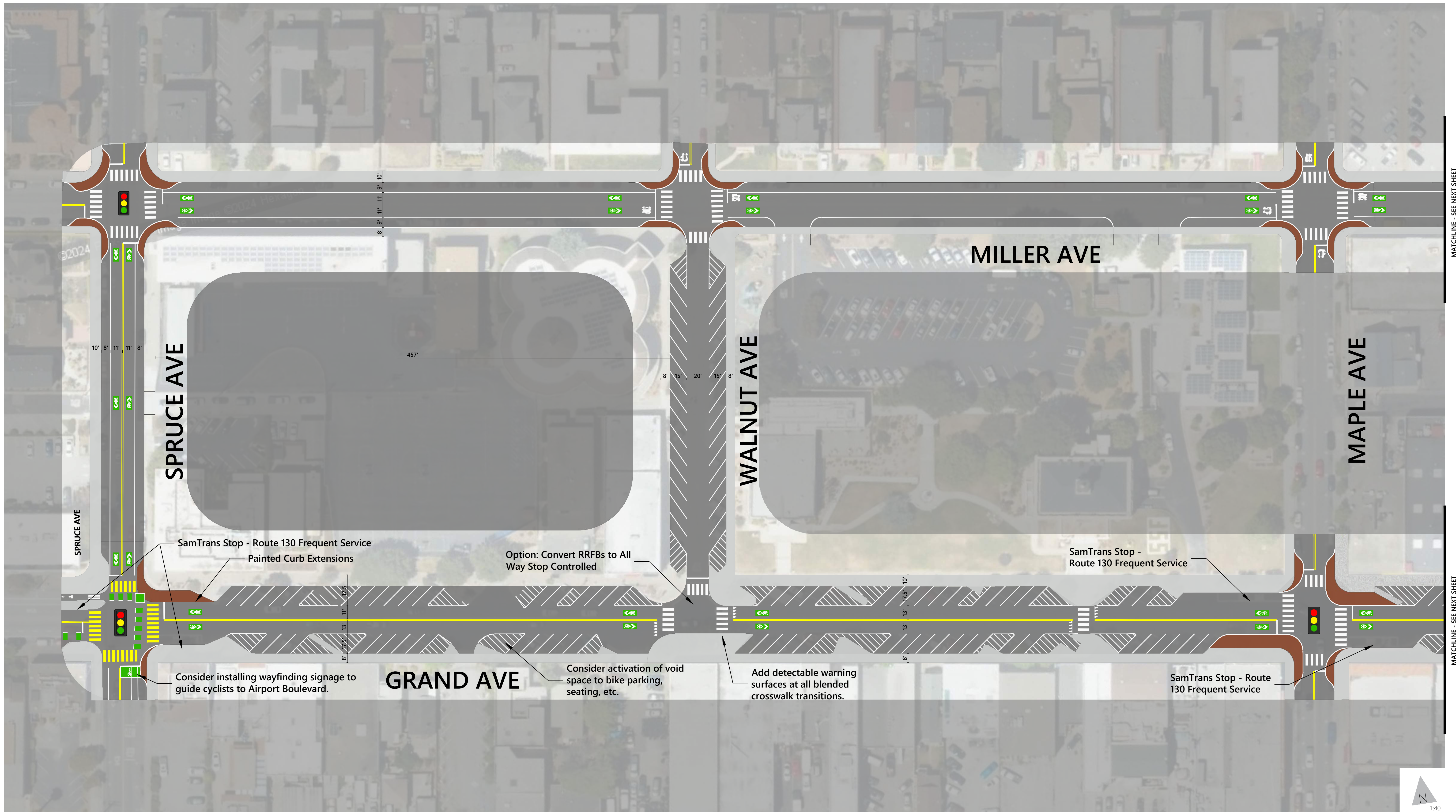
Baden Avenue & Maple Avenue, Linden Avenue: Install painted bulb outs and high visibility crosswalks. Consider additional treatments to enforce the turning radius such as rubber speed humps or armadillos (typical). At Linden, future phases of analysis may evaluate the need for two northbound right turn lanes.

Commercial Avenue & Maple Avenue: Install painted bulb outs and high visibility crosswalks. Consider additional treatments to enforce the turning radius such as rubber speed humps or armadillos.

Commercial Avenue and Linden Avenue: Install painted bulb outs and high visibility crosswalks across all legs. Convert the intersection to all-way stop-control if warrants are met to support pedestrian crossing safety.

Railroad Avenue and Linden Avenue: Install painted bulb outs to support more traditional intersection geometry and install high visibility crosswalks across all legs. Consider additional treatments to enforce the turning radius such as rubber speed humps or armadillos.

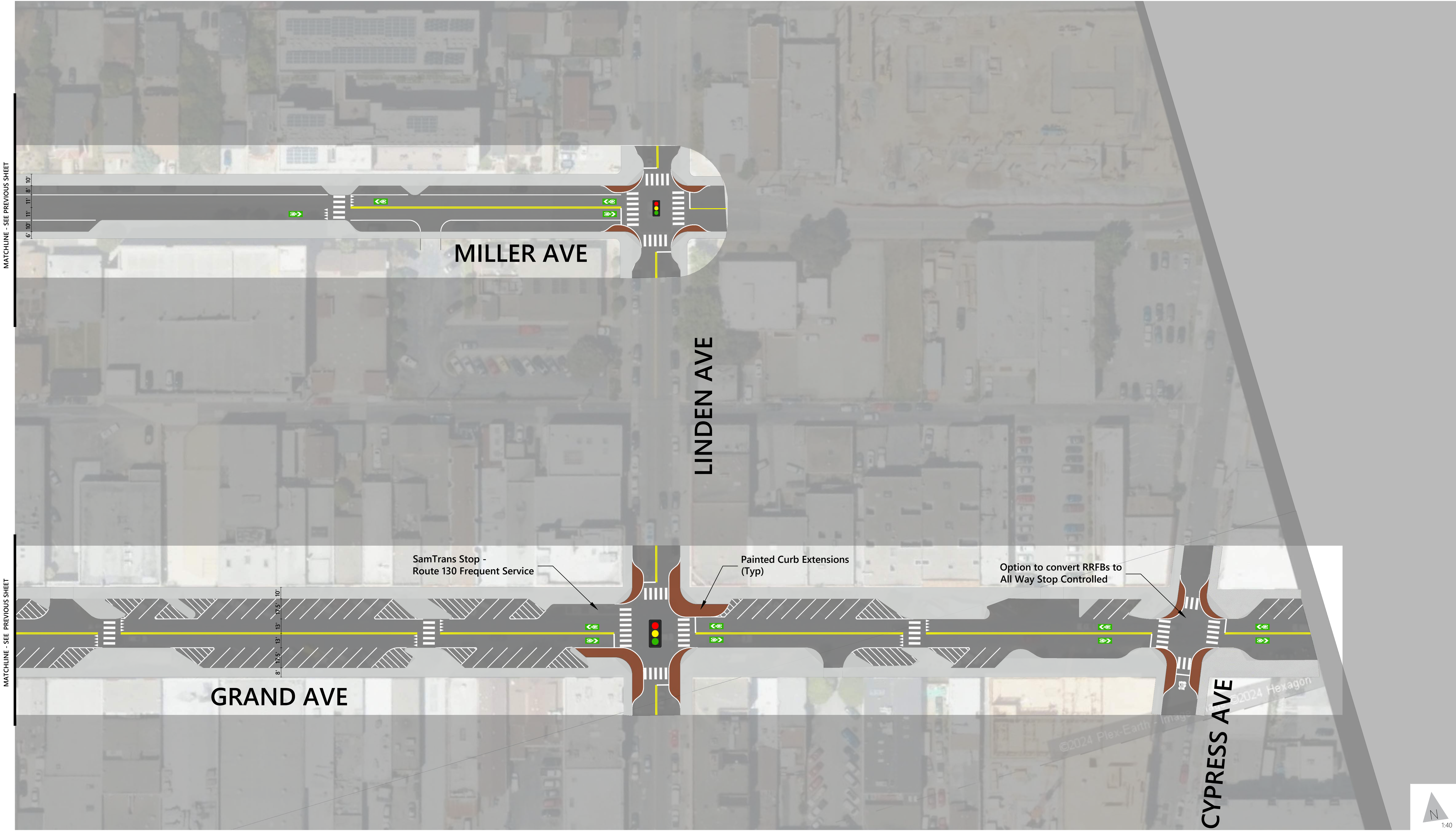
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Figure 7.1 - Downtown
Alternative 1 - Near-Term Improvements
South San Francisco WEST 101 Complete Streets

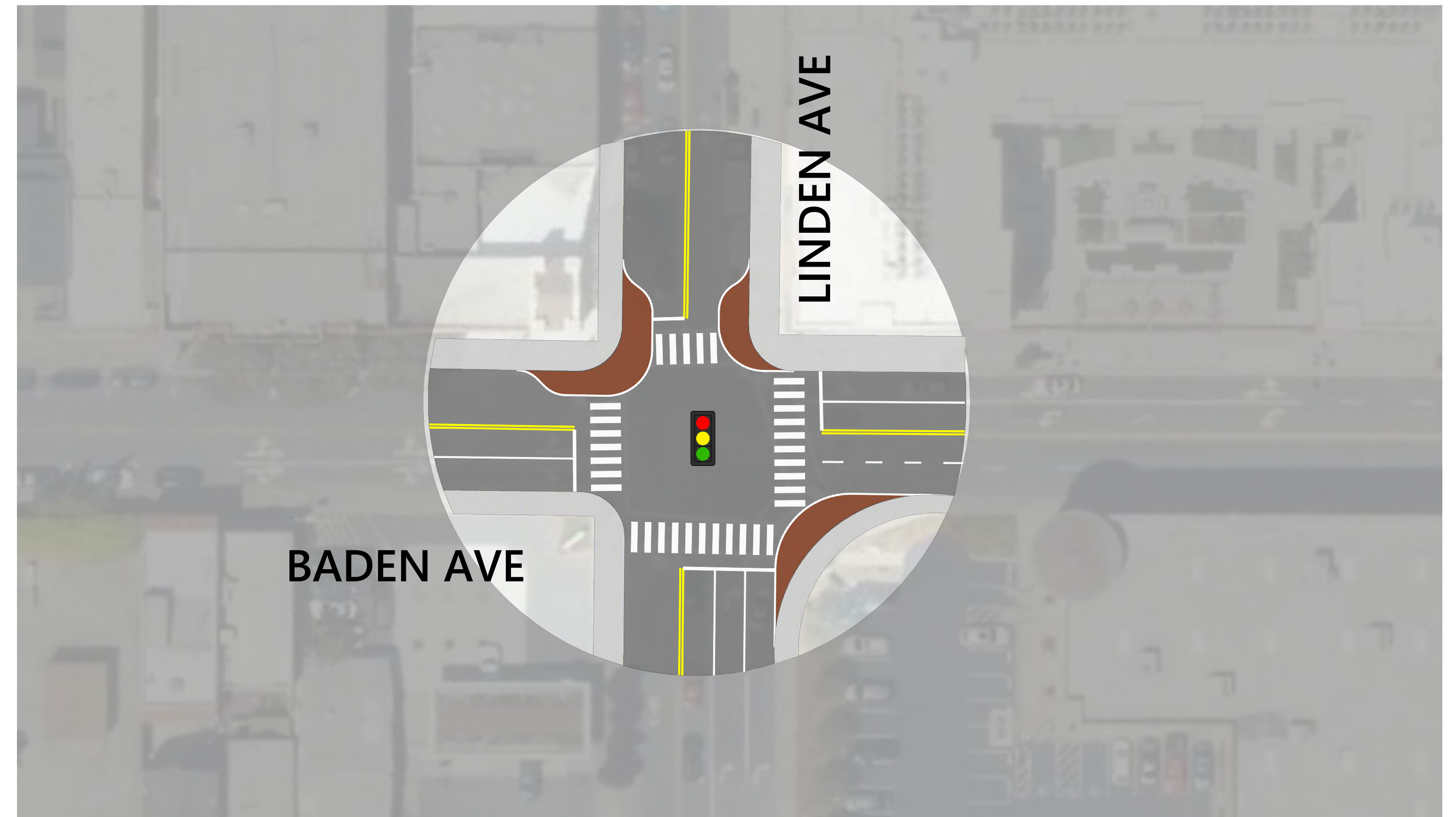
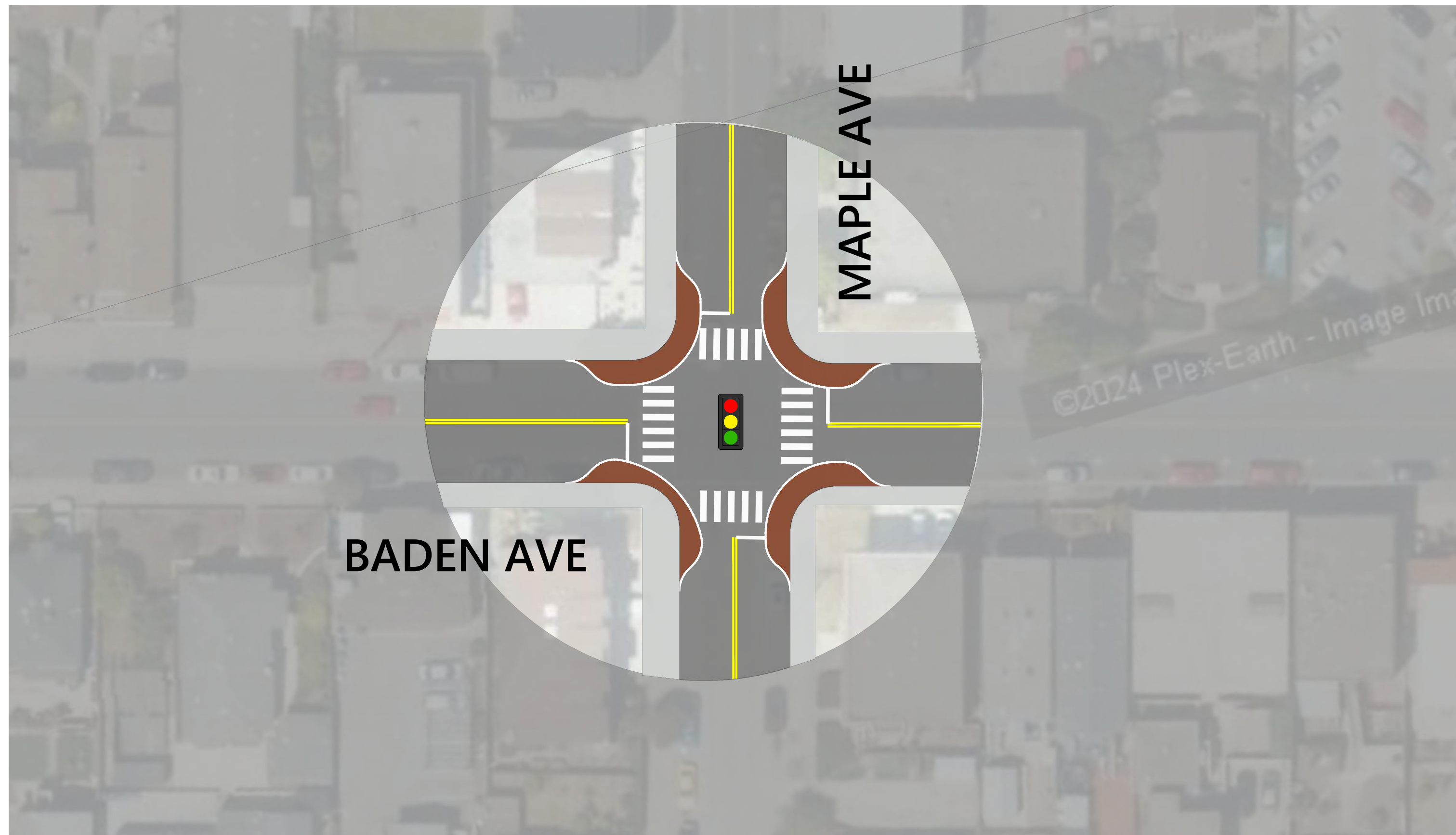
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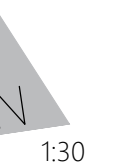
Figure 7.2 - Downtown
Alternative 1 - Near-Term Improvements
South San Francisco WEST 101 Complete Streets

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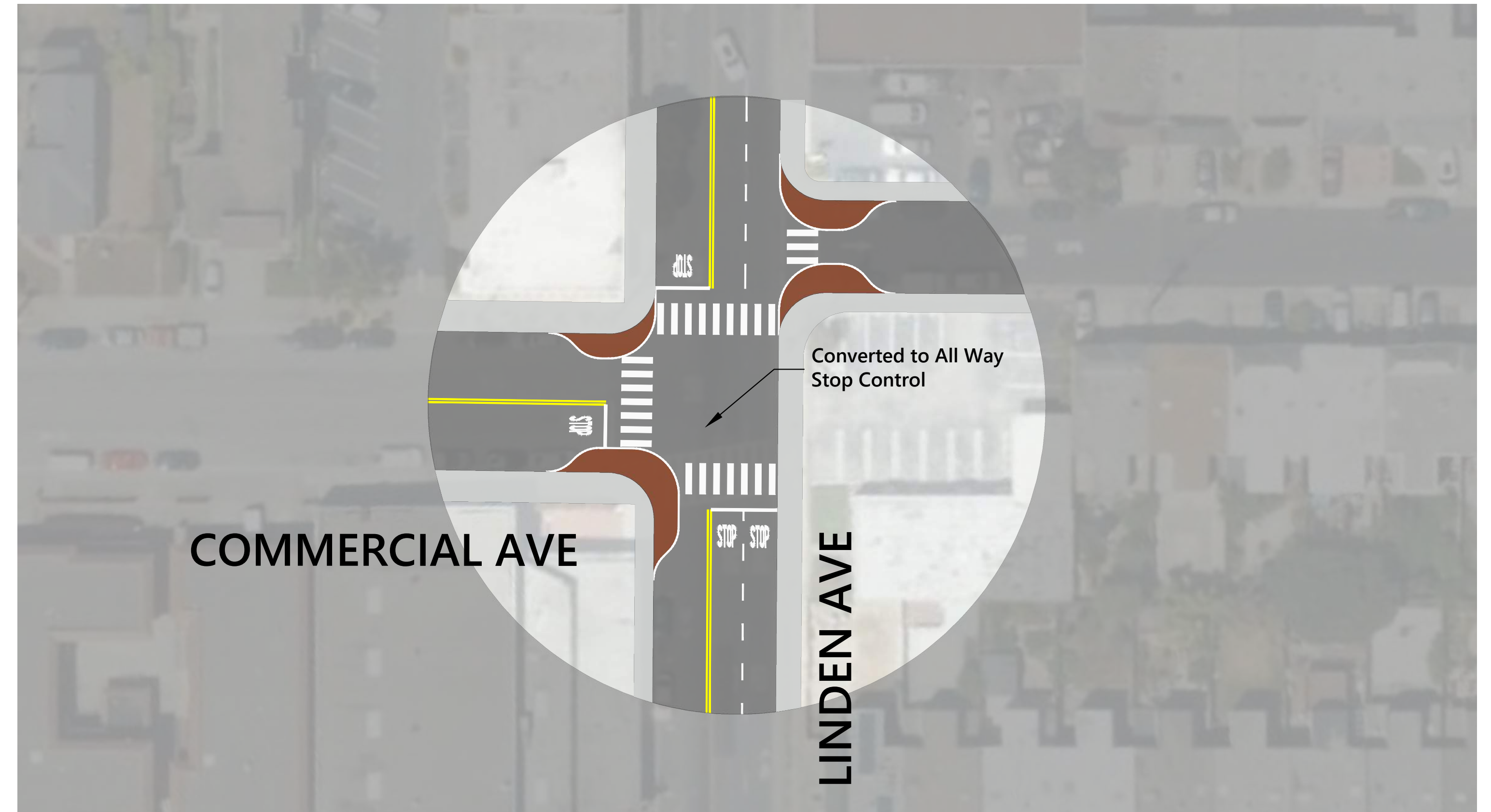
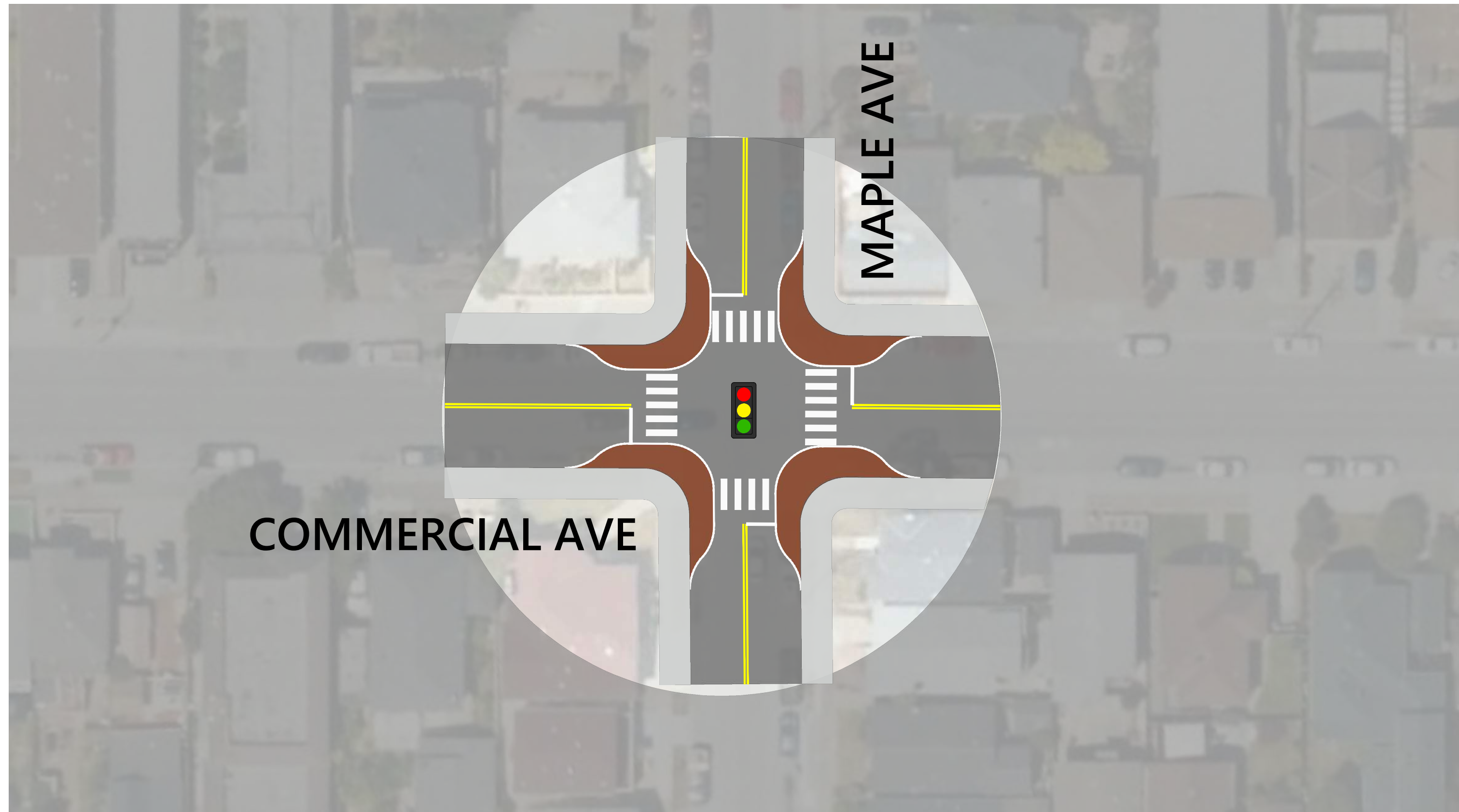
CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL
DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 7.3 - Downtown
Alternative 1 - Near-Term Improvements
South San Francisco WEST 101 Complete Streets



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CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 7.4 - Downtown
Alternative 1 - Near-Term Improvements
South San Francisco WEST 101 Complete Streets

Alternative 2: Corridor Treatments

Bike Facilities

- Grand Avenue: Maintain Class III shared lane markings, and install vertical elements to support speeds consistent with a shared lane condition.
- Spruce Avenue: Two-way Class IV bikeway on the west side of the street. Bikeway should be at street level with a concrete curb for vertical separation.
- Miller Avenue: Two-way Class IV bikeway on the south side of the street. Bikeway should be at street level with a concrete curb for vertical separation.

Pedestrian Facilities: Alternative w does not propose changes to the existing sidewalks, but introduces bulb outs, high visibility crossings, and other safety enhancements throughout the subarea.

Transit Facilities: Alternative 2 proposes upgraded bus stops to in-lane and far-side stops where possible.

Vehicle Lanes: Alternative 2 maintains the existing vehicle lane configurations. Consider removing the centerline striping along Miller Avenue to encourage slow vehicle speeds.

Parking:

- Grand Avenue and Walnut: Convert on-street parking to back-in angled parking. The parking conversion may be implemented with new curb lines.
- Spruce Avenue: remove on-street parking on the west side of the street from Grand Avenue to Miller Avenue.
- Miller Avenue: Remove on-street parking on the south side of the street from Spruce Avenue to Airport Boulevard.

Alternative 2: Intersection Treatments

Miller Avenue & Spruce Avenue: Install bulb outs on the north side of the street. Facilitate bicycle crossing along the south leg to connect the bikeways on Spruce Ave and Miller Ave.

Miller Avenue & Walnut Avenue, Maple Avenue, and Linden Avenue: Install bulb outs on the north side of the street and green cross bike marking across the south leg.

Grand Avenue & Spruce Avenue: Install bulb outs and conform to the designs for Grand Avenue west of the intersection and Spruce Avenue south of the intersection. Consider a diagonal bike crossing with a separate bicycle and pedestrian scramble phase.

Grand Avenue & Walnut Avenue: Install a raised and/or textured intersection. Consider installing all-way stop-control if warrants are met.

Grand Avenue & Maple Avenue, Linden Avenue, and Cypress Avenue: Install bulb outs. Continue treatments to Airport Boulevard to connect to the existing protected intersection and connection under Caltrain.

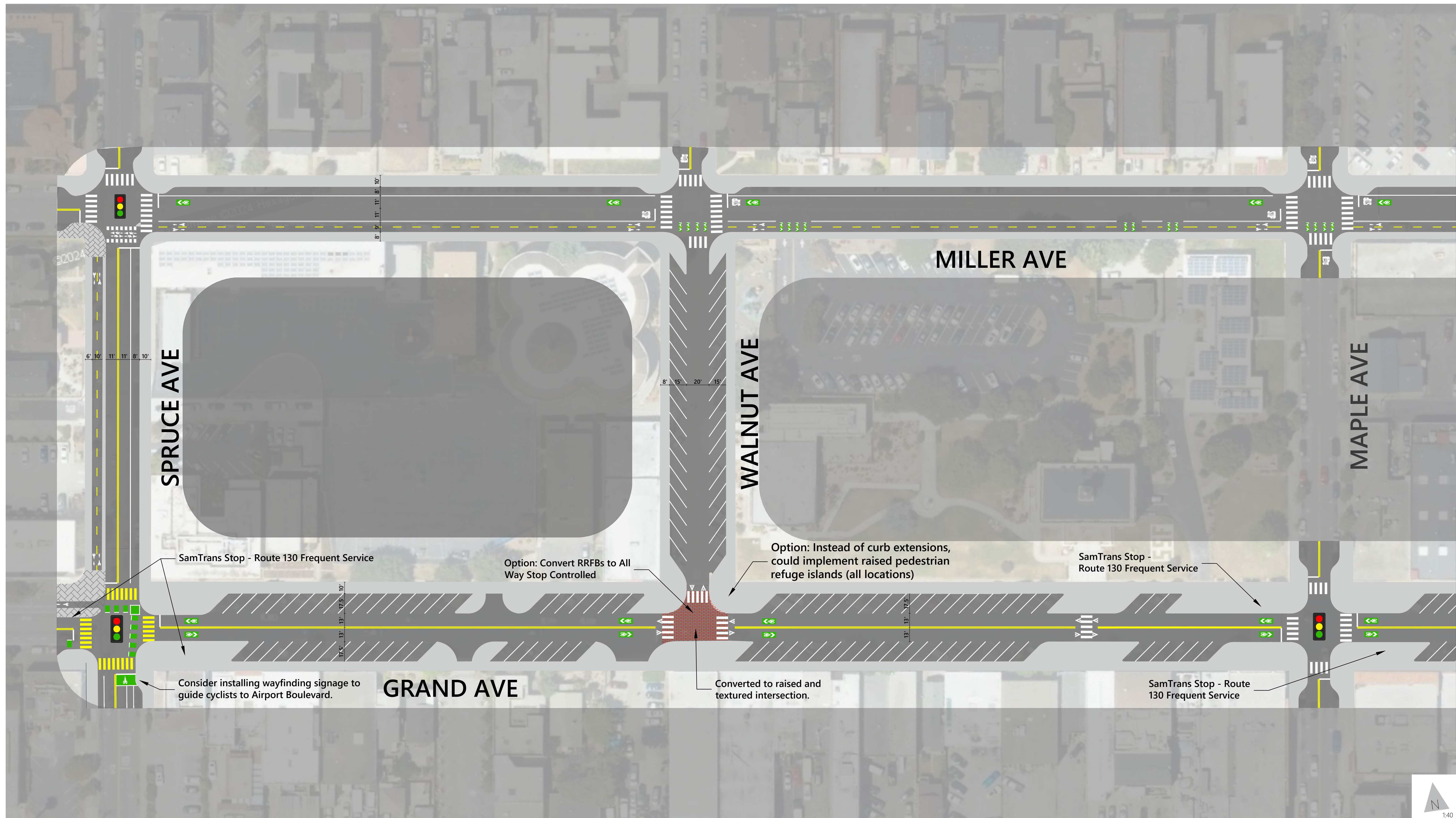
Baden Avenue & Mapel Avenue, Linden Avenue: Install bulb outs and high visibility crosswalks. At Linden, future phases of analysis may evaluate the need for two northbound right turn lanes.

Commercial Avenue & Maple Avenue: Install bulb outs and high visibility crosswalks.

Commercial Avenue and Linden Avenue: Install bulb outs and high visibility crosswalks across all legs. Convert the intersection to all-way stop-control if warrants are met to support pedestrian crossing safety.

Railroad Avenue and Linden Avenue: Install bulb outs to support more traditional intersection geometry and install high visibility crosswalks across all legs.

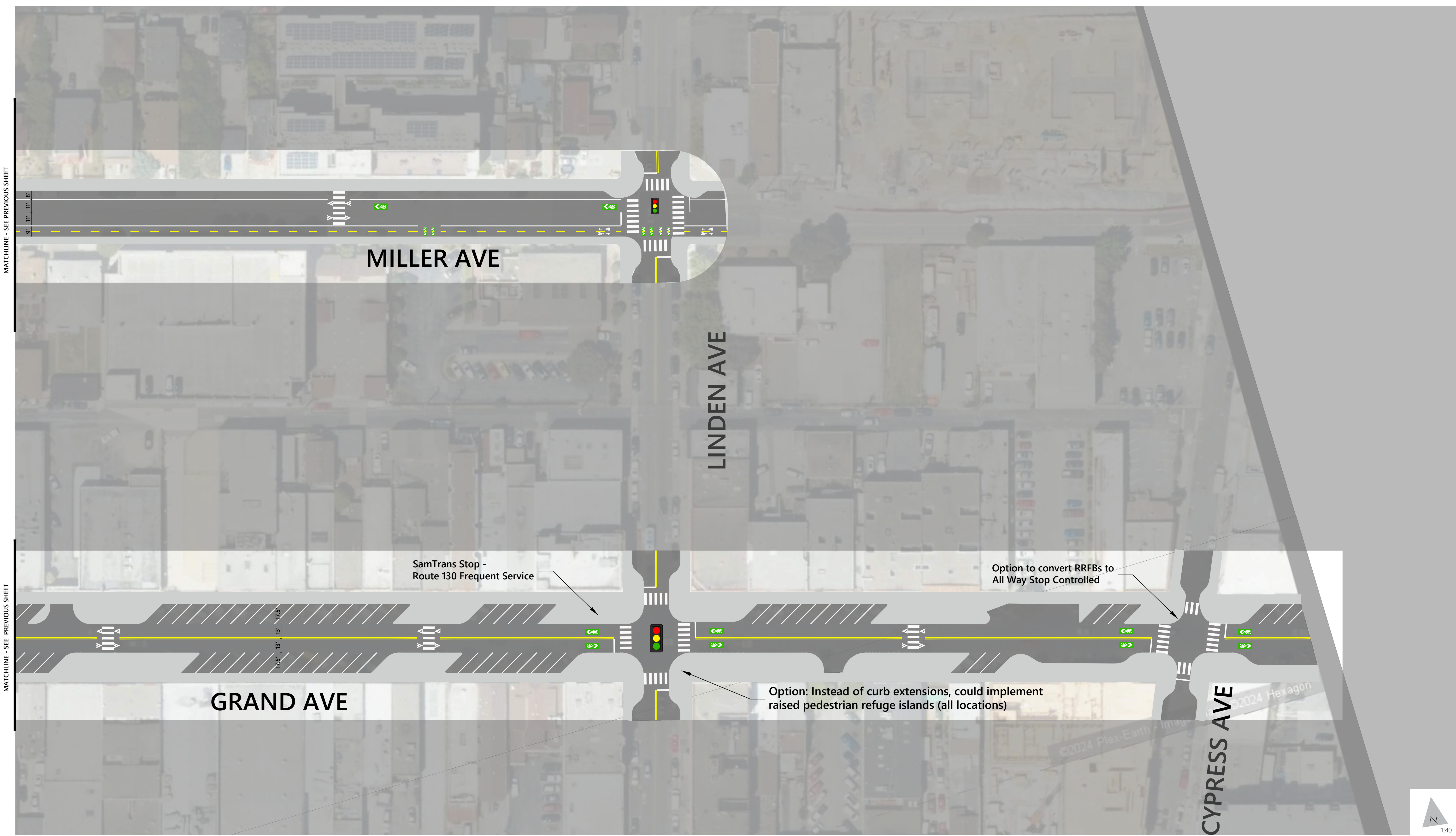
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CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 7.5 - Downtown
Alternative 2 - Long-Term Improvements
South San Francisco WEST 101 Complete Streets

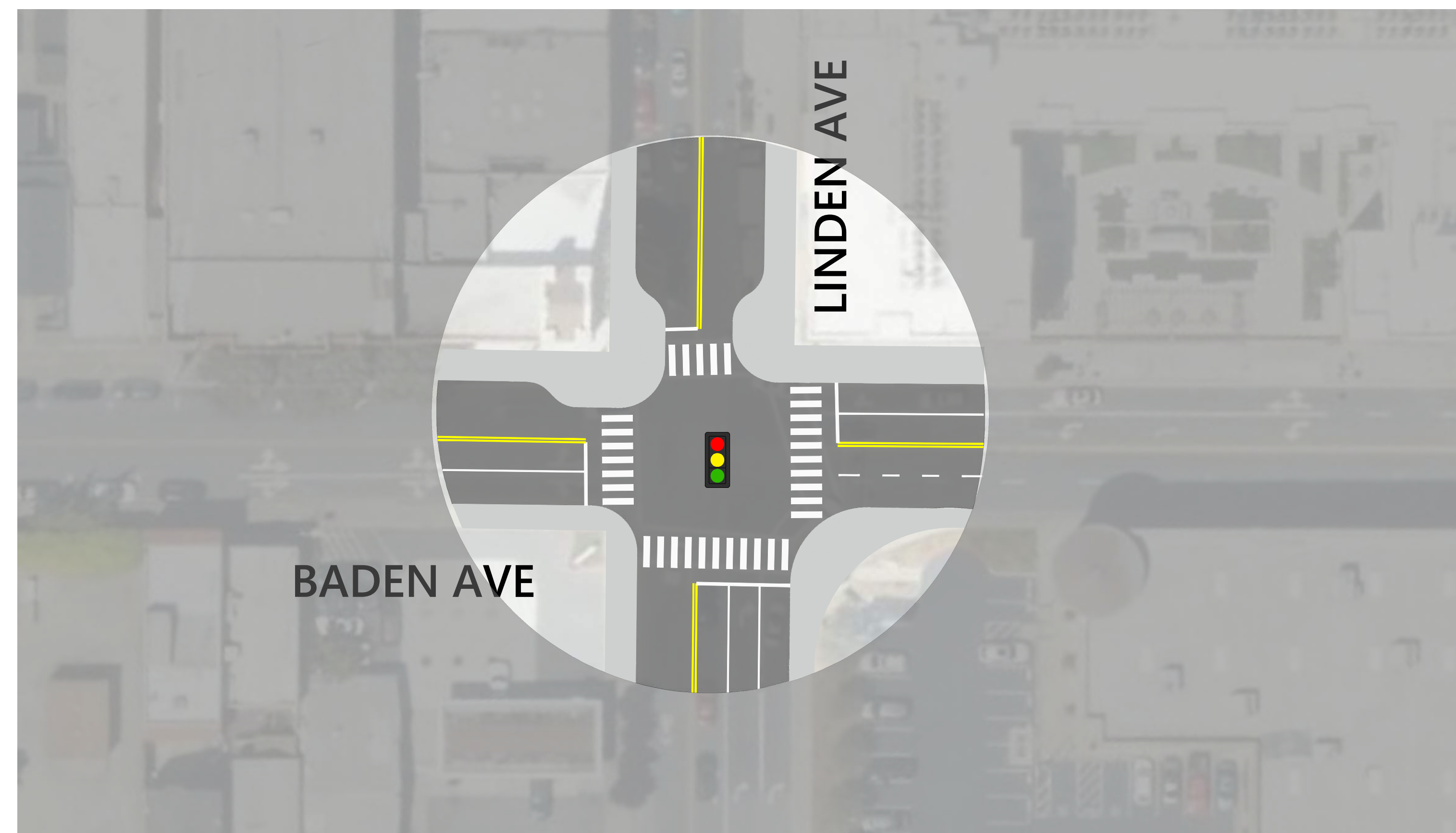
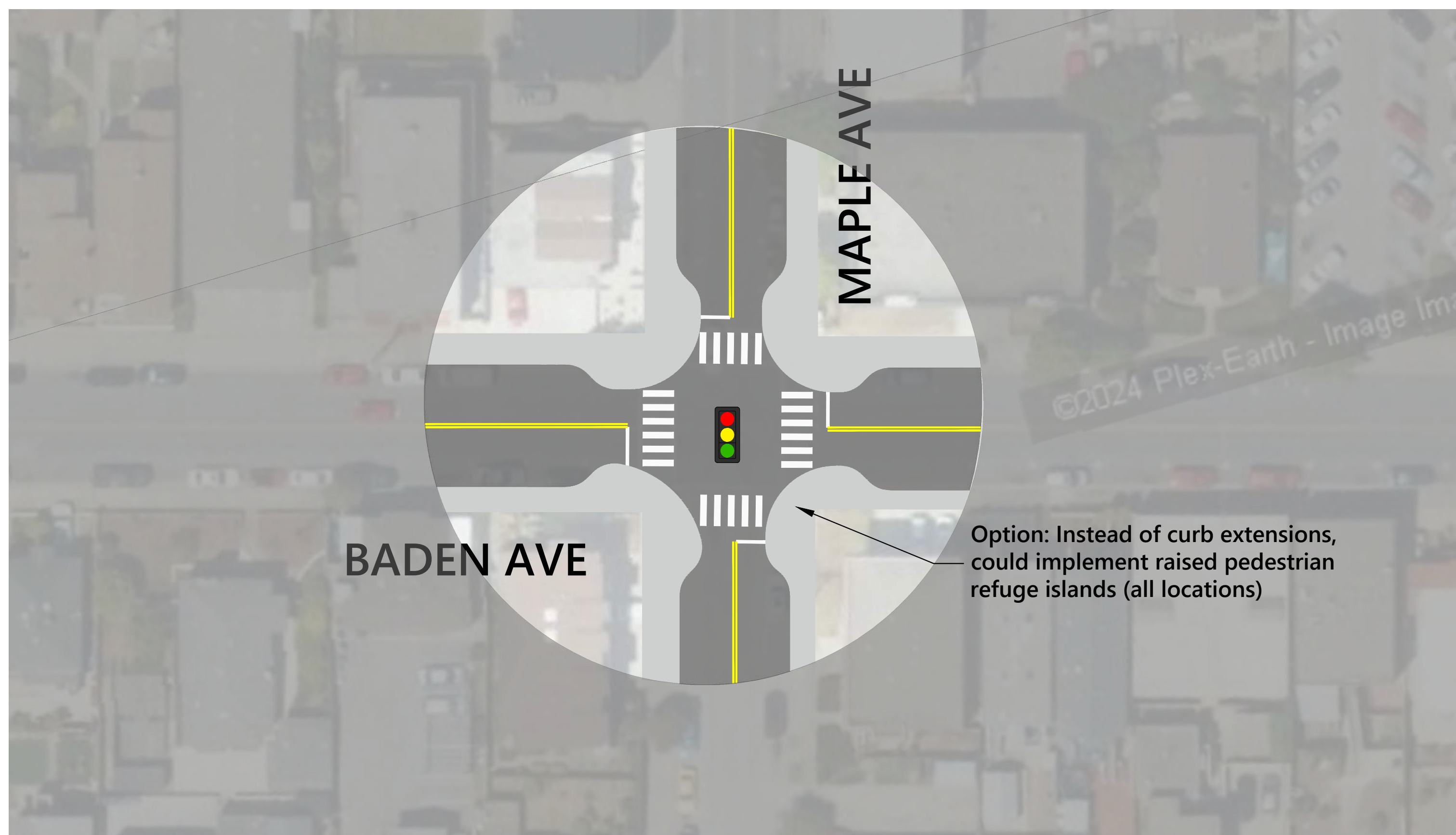
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Dec 05, 2025



CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

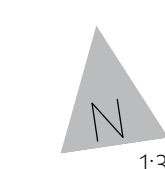
Figure 7.6 - Downtown Alternative 2 - Long-Term Improvements South San Francisco WEST 101 Complete Streets

Dec 05, 2025
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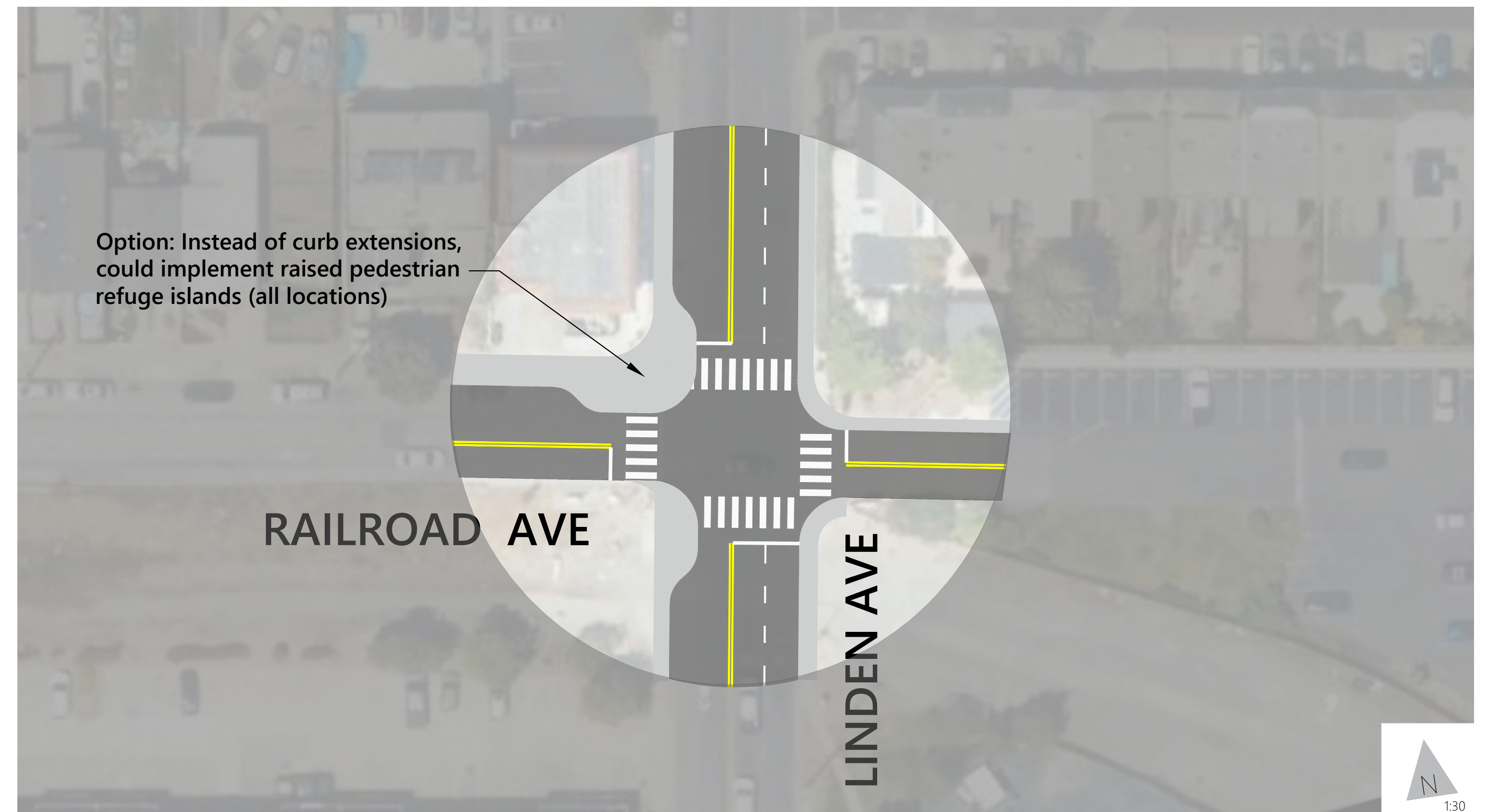
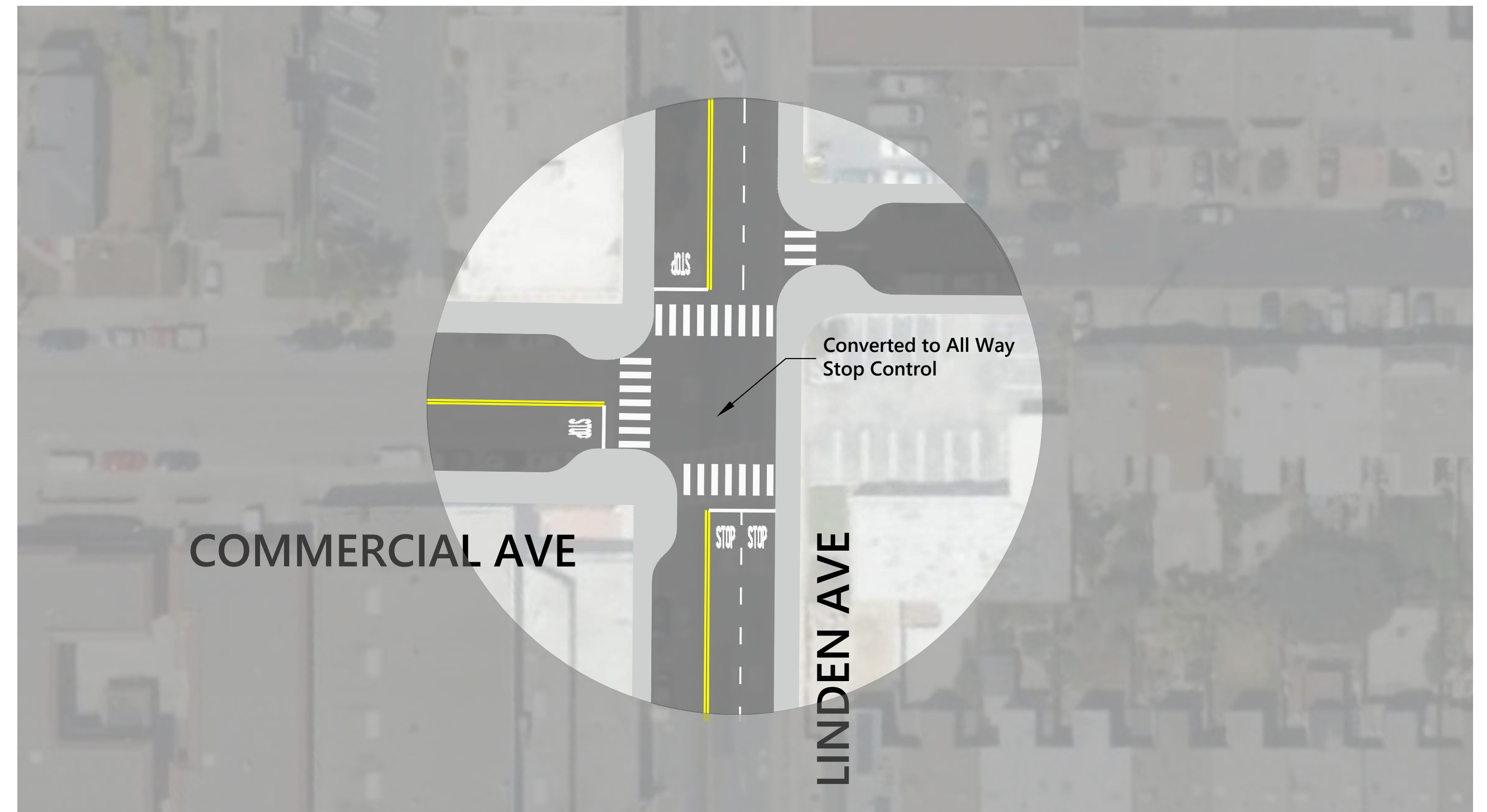
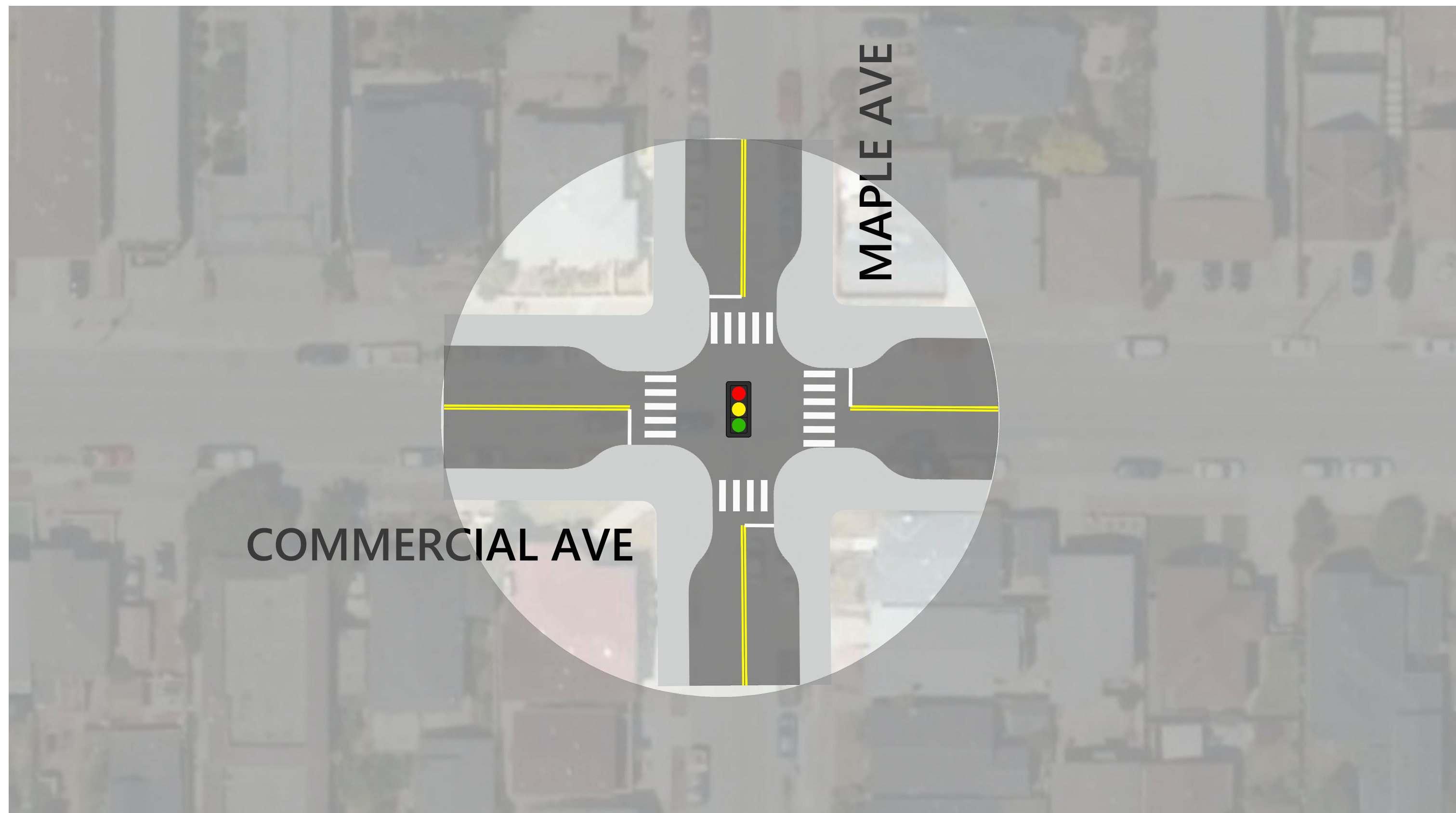
CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 7.7 - Downtown
Alternative 2 - Long-Term Improvements
South San Francisco WEST 101 Complete Streets



1:30

Dec 05, 2025
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CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

Figure 7.8 - Downtown Alternative 2 - Long-Term Improvements South San Francisco WEST 101 Complete Streets

7.3 Design Evaluation

Corridor		Alternative 1	Alternative 2
Category	Metric		
Vehicle Operations	Does the proposed design support existing volumes compared to planning-level volume thresholds?	●	●
	Does the proposed design accommodate future forecasted volumes along the corridor?	●	●
Transit	Does the proposed design provide transit only lanes, queue jumps, in-lane/far-side bus stops, and other design features that allow for improved bus speed and reliability?	◐	●
	Does it allow for the inclusion of TSP in future detailed design?	N/A	N/A
Bicycle Connectivity	Does the design meet recommended bikeway type for speeds and volumes per DIB 94 Guidelines?	◐	◐
	Does the design align with recommendations in the Active South City Plan?	◐	◐
	Does the signal phasing and/or intersection treatments facilitate protected movements for bikes?	◐	◐
Pedestrian Connectivity	Does the proposed design provide continuous sidewalks with recommended widths per General Plan corridor type?	●	●
	Does the design shorten crossing distances, provide advanced stop bars, implement LPIs at signals, and/or implement FHWA-aligned crossing treatments for uncontrolled crossings?	●	●
Safety	Does the design remove severe conflicts between road users?	◐	◐
	Does the design help slow/manage vehicle speeds?	◐	●
	Does the design facilitate separating conflicts in time where signals are present?	●	●
	Does the design incorporate treatments to increase user attentiveness/awareness at locations with severe conflicts?	◐	●

Vehicle Capacity

The proposed designs for Alternative 1 and 2 do not impact the existing vehicle capacity of the roadways.

Transit

The proposed designs include in-lane bus stops, moving to the far side where feasible. There are no dedicated transit facilities due to the existing two-lane configuration along Grand Avenue.

Bicycle Connectivity

Alternative 1: The designs do not make changes to the existing bicycle facilities, although it does make changes to improve safety – especially along Grand Avenue where back-in angled parking will improve visibility for bikes. The alternative partially aligns with the recommendations in the Active South City Plan although it does include Class IIB bike lanes along Grand Avenue.

Alternative 2: The designs provide separated facilities along Spruce Avenue and Miller Avenue, as well as Class IIIB bicycle boulevard treatments along Grand Avenue. These recommendations improve the connectivity and level of safety for bicycles. The alternative does not align with the recommendations in the Active South City Plan, which recommends Class III treatments on Miller and Spruce, and Class IIB treatment on Grand Avenue.

Pedestrian Connectivity

Alternative 1: The alternative maintains the existing continuous sidewalks within downtown, with quick-build intersection treatments such as bulb outs, high visibility crosswalks, and advanced stop/yield markings to improve the comfort of pedestrians.

Alternative 2: The alternative maintains the existing continuous sidewalks within downtown, with permanent intersection treatments such as bulb outs, high visibility crosswalks, and advanced stop/yield markings to improve the comfort of pedestrians.

Multimodal Safety

Fehr & Peers did not perform the Safe System Project-Based Alignment Framework for the downtown sub area. Both alternatives provide safety benefits for people walking and biking, although there is likely greater benefit associated with alternative 2 due to more permanent infrastructure changes, separated bikeways, and traffic calming features.

Parking

Alternative 1: The near-term conversion to back-in angled parking results in the loss of 24 parking spaces along Grand Avenue. Parking loss along the other corridors is limited to spaces on approach to the intersection.

Alternative 2: The long-term conversion to back-in angled parking results in a total gain of 14 parking spaces along Grand Avenue (the changes in curb line allow for additional parking spaces compared to existing conditions). 11 on-street parking spaces are removed along the west side of Spruce Avenue, and 49 spaces are removed along the south side of Miller Avenue.

Appendix A: Existing Conditions



West of 101 Complete Streets

EXISTING CONDITIONS
AND DATA EVALUATION

December 5, 2024

Overview of Previous Studies

Active South City Plan (2022)



BICYCLE LEVEL OF TRAFFIC STRESS

ACTIVE SOUTH CITY

Bikeways

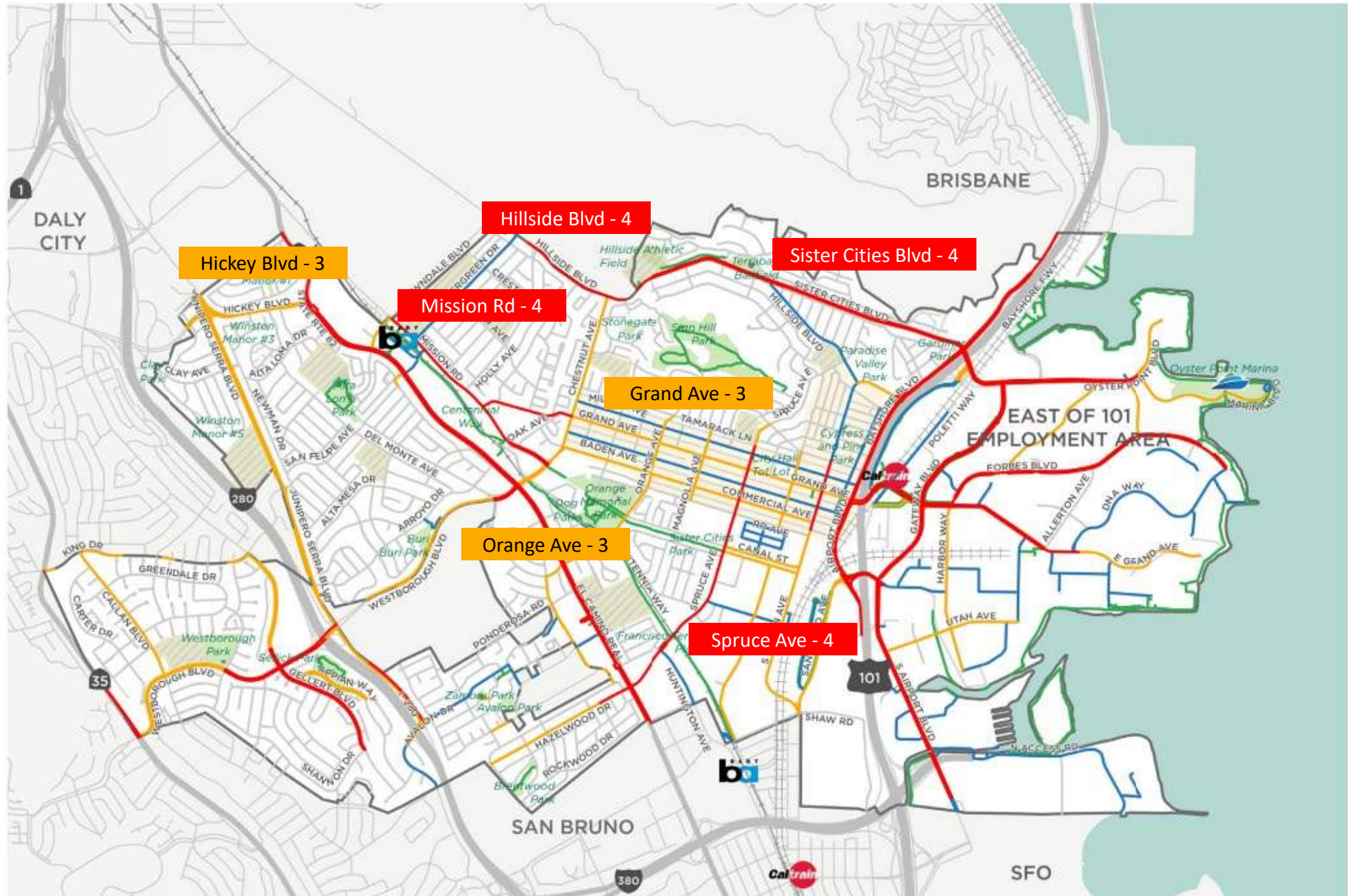
- Level 1 All Ages and Abilities
- Level 1 All Ages and Abilities (Residential)
- Level 2 Average Adult
- Level 3 Confident Adult
- Level 4 Fearless Adult

Transportation

- Ferry Dock
- BART Station
- Caltrain Station
- Caltrain Rail Line
- BART Line

Destinations

- Community Center
- School
- Park
- Library
- Downtown







HIN
Hillside
Sister Cities
Hickey
Spruce
Orange

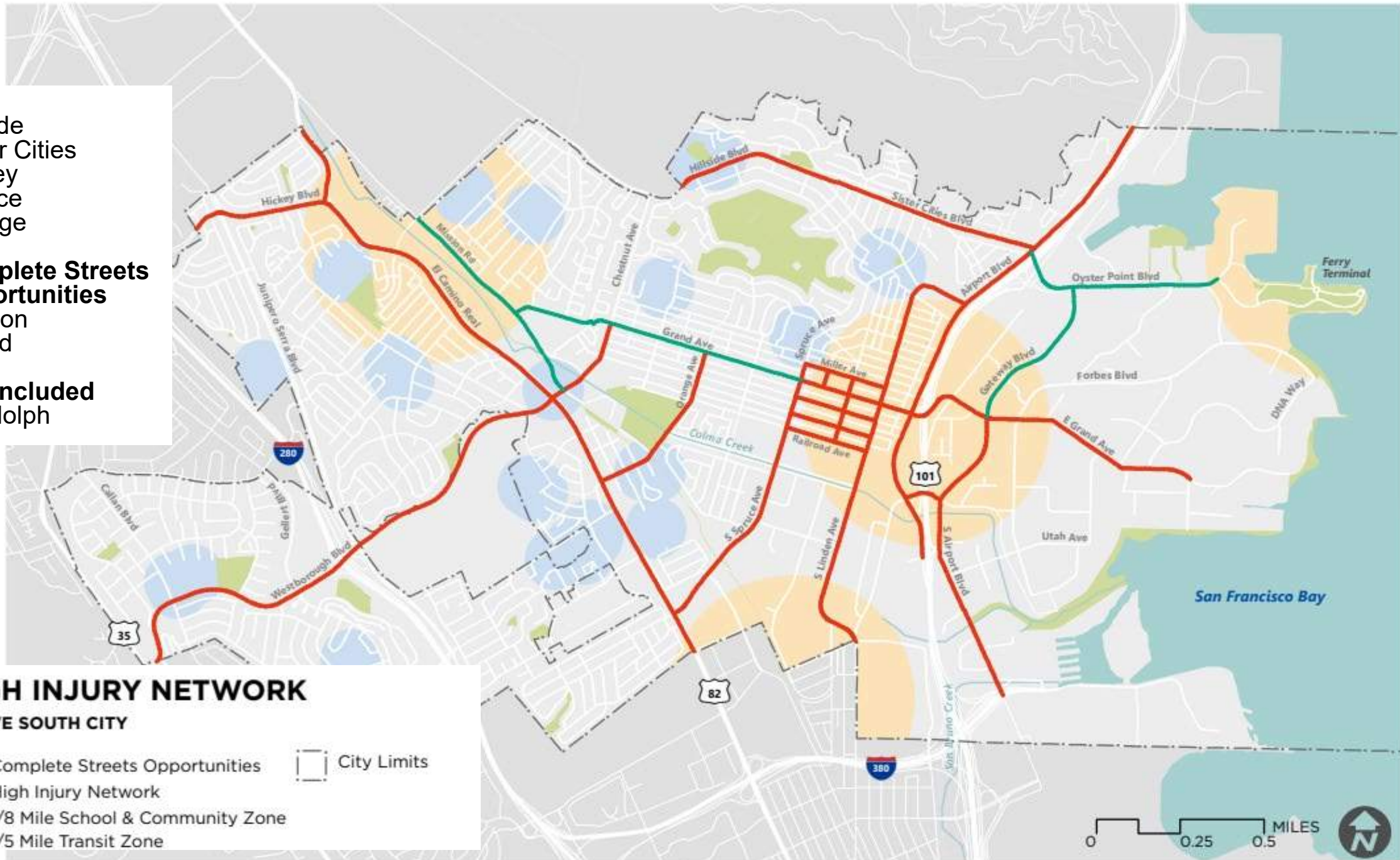
Complete Streets Opportunities
Mission
Grand

Not included
Randolph

HIGH INJURY NETWORK

ACTIVE SOUTH CITY

-  Complete Streets Opportunities
-  High Injury Network
-  1/8 Mile School & Community Zone
-  1/5 Mile Transit Zone
-  City Limits



RECOMMENDED BIKEWAYS

ACTIVE SOUTH CITY

Bikeways

EXIST PROPOSED

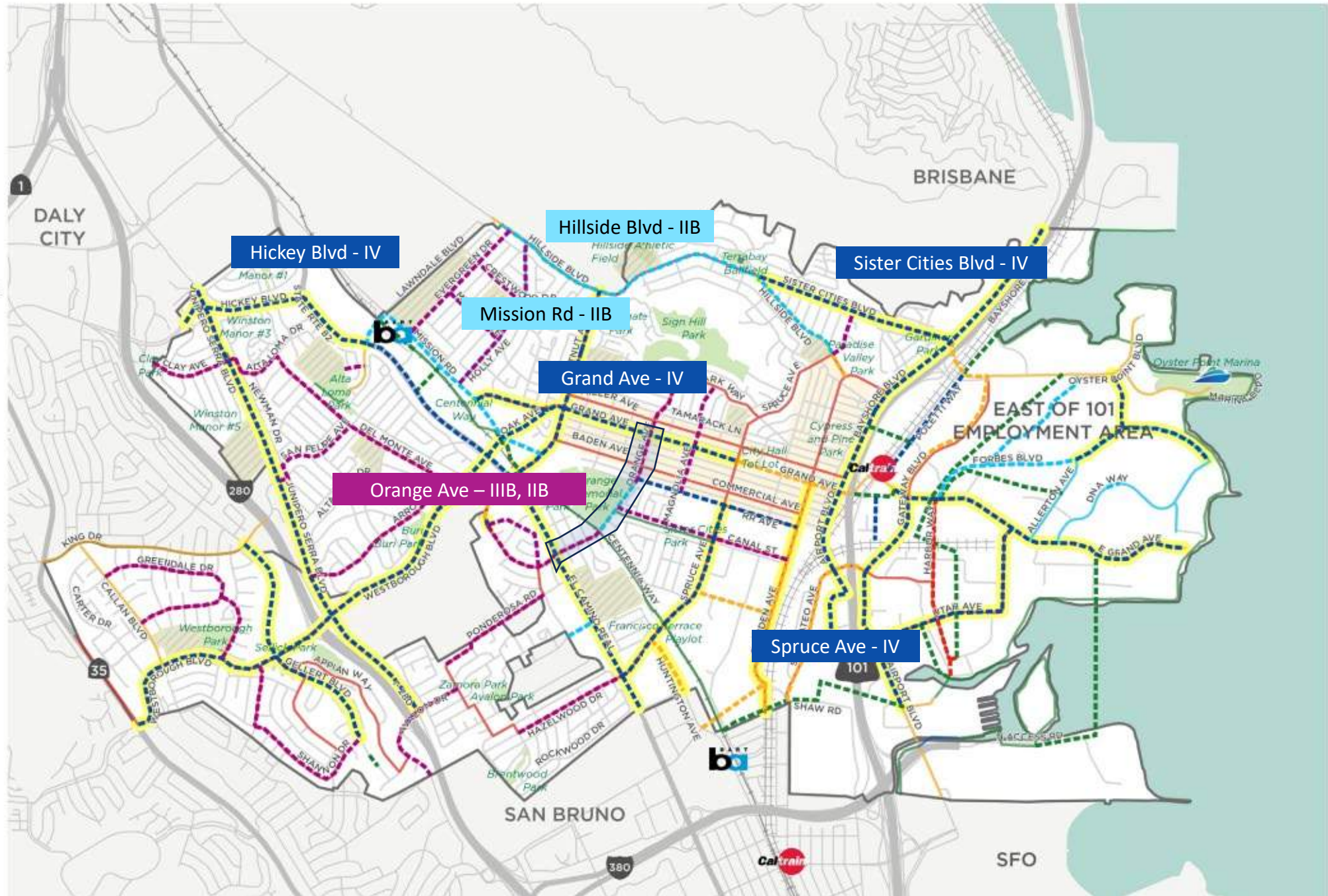
- Class I Shared-Use Path
- Class II Bicycle Lane
- Class IIB Buffered Bicycle Lane
- Class III Bicycle Route
- Class IIIB Bicycle Boulevard
- Class IV Separated Bikeway
- Study Corridor*

Transportation

- Ferry Dock
- BART Station
- Caltrain Station
- Caltrain Rail Line
- BART Line

Destinations

- Community Center
- School
- Park
- Library
- Downtown



Local Road Safety Plan (2022)

- **Analysis of Collisions by Severity**

Fatal Injuries occurred at:

- S Spruce Avenue and El Camino Real
- Hickey Boulevard and Hilton Avenue

- **Priority Projects Identified for**

- Grand Avenue and Spruce Avenue
- Spruce Avenue and N Canal Street
- Linden Avenue and Grand Avenue

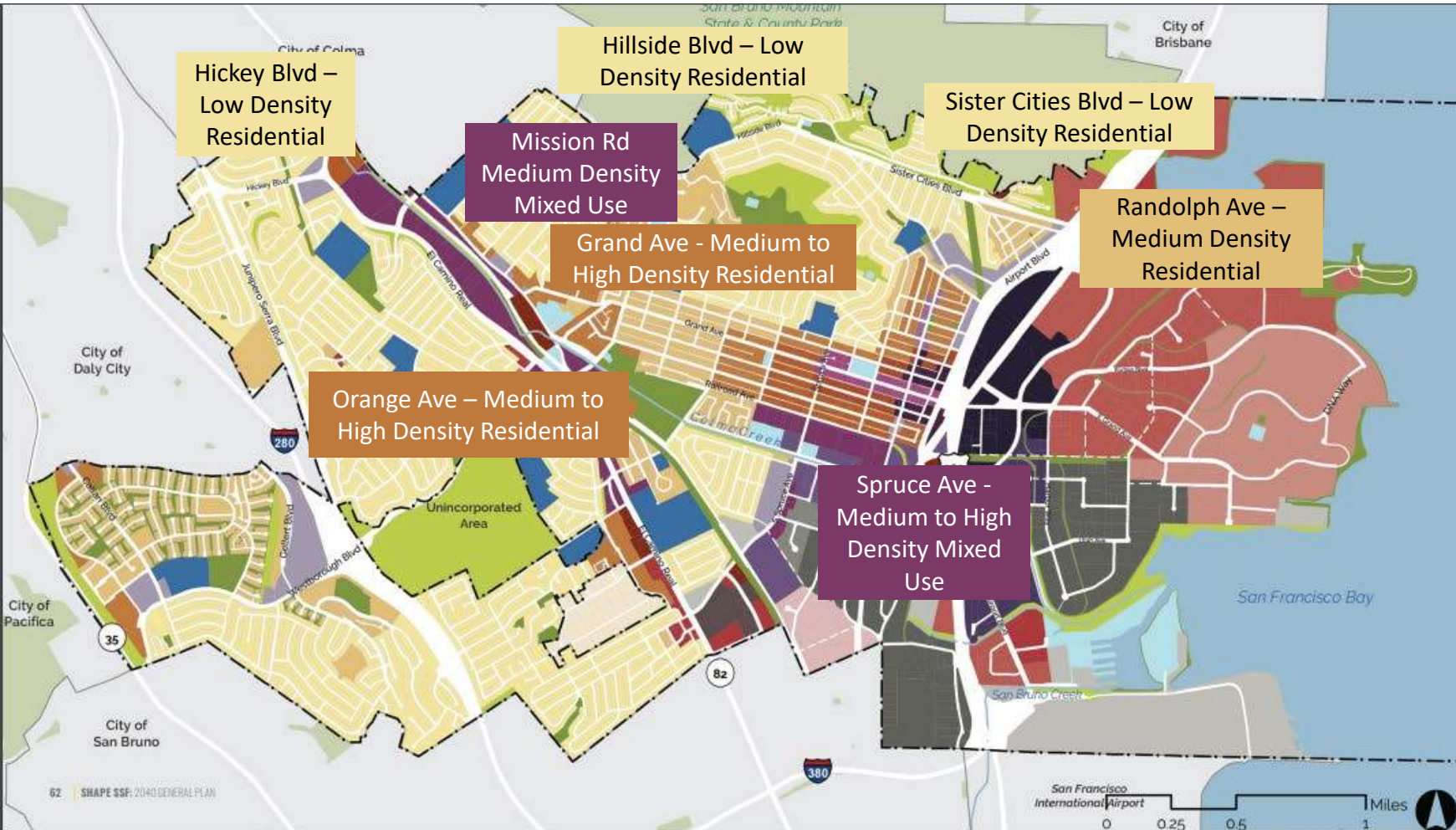


General Plan (2022)

- **Existing Land Uses**
- **Proposed Land Uses**
 - Varies from low density residential to high density mixed use
- **Proposed Roadway Network**
 - Collector: Chestnut, Grand, Spruce, Orange
 - Arterial: Airport, Hillside, Sister Cities, Hickey, Mission
 - Local: Randolph
- **Specific Plans**
 - Chestnut Avenue and Antoinette Lane Intersection Improvement
 - Lindenville Specific Plan (S Spruce Ave)



Land Use



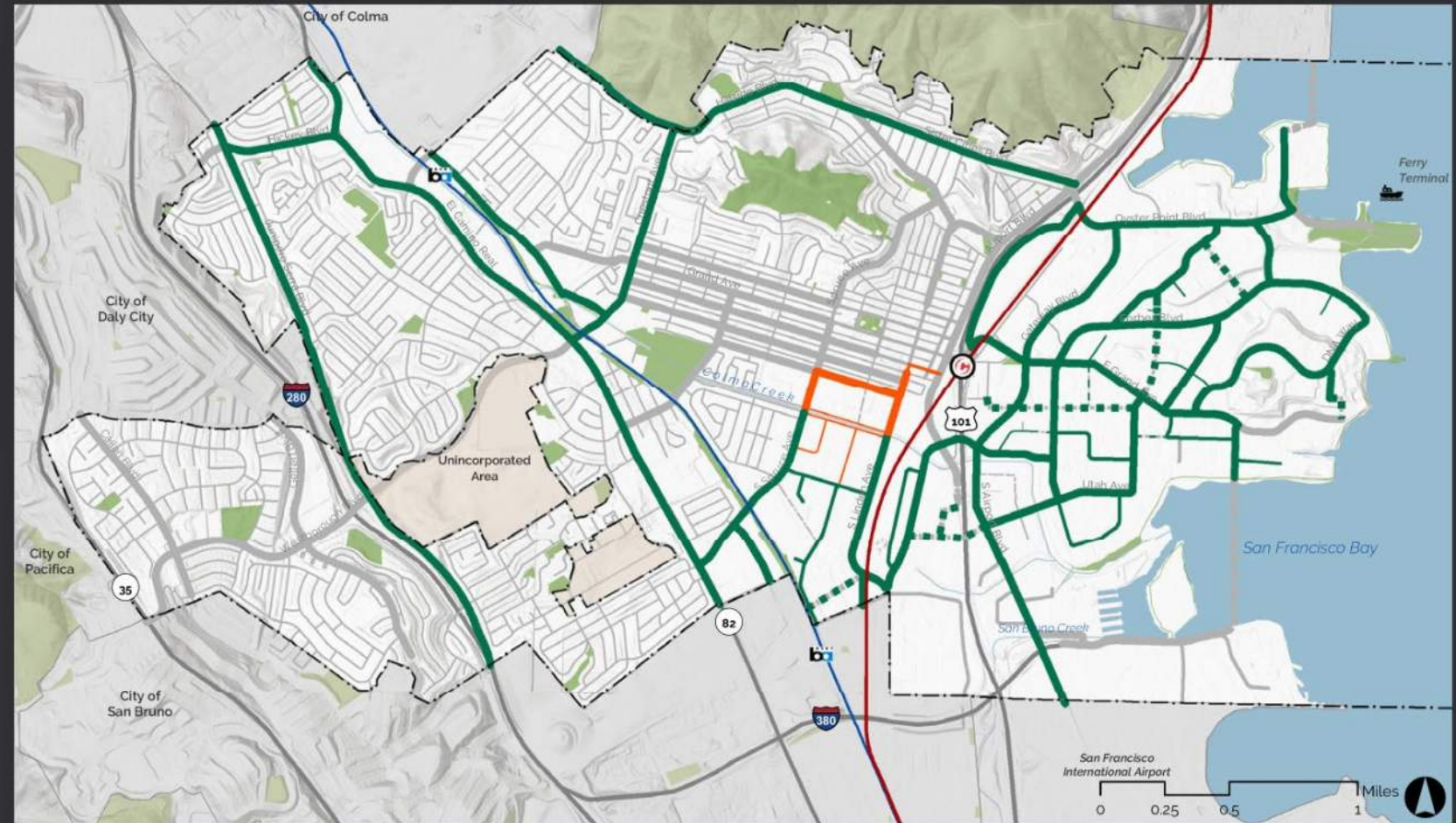
**Figure 6:
General Plan Land Use**

Residential	Mixed Use	Non-Residential
San Mateo County Low Density Residential	Low Density Mixed Use	Business and Professional Office
Low Density Residential	Linden	Business Technology Park
Medium Density Residential	Neighborhood Center	Business Technology Park High
Medium High Density Residential	Grand Avenue Core	Community Commercial
High Density Residential	Medium Density Mixed Use	Oyster Point
Downtown Residential Core	High Density Mixed Use	Coastal Commercial
Urban Residential	East of 101 Mixed Use	Mixed Industrial
	Downtown Transit Core	Mixed Industrial High
	East of 101 Transit Core	Industrial Transition Zone
Civic/Other		
Planned Development	Public	Parks and Recreation
Transportation	School	Open Space
Proposed Network Updates & Revisions		
City of South San Francisco	Waterbody	
Context Parks	Streams	

Truck Routes

- Mission Road
- Hillside & Sister Cities Boulevard
- Spruce Avenue
- Hickey Boulevard

Figure 16: Truck Network and Restrictions

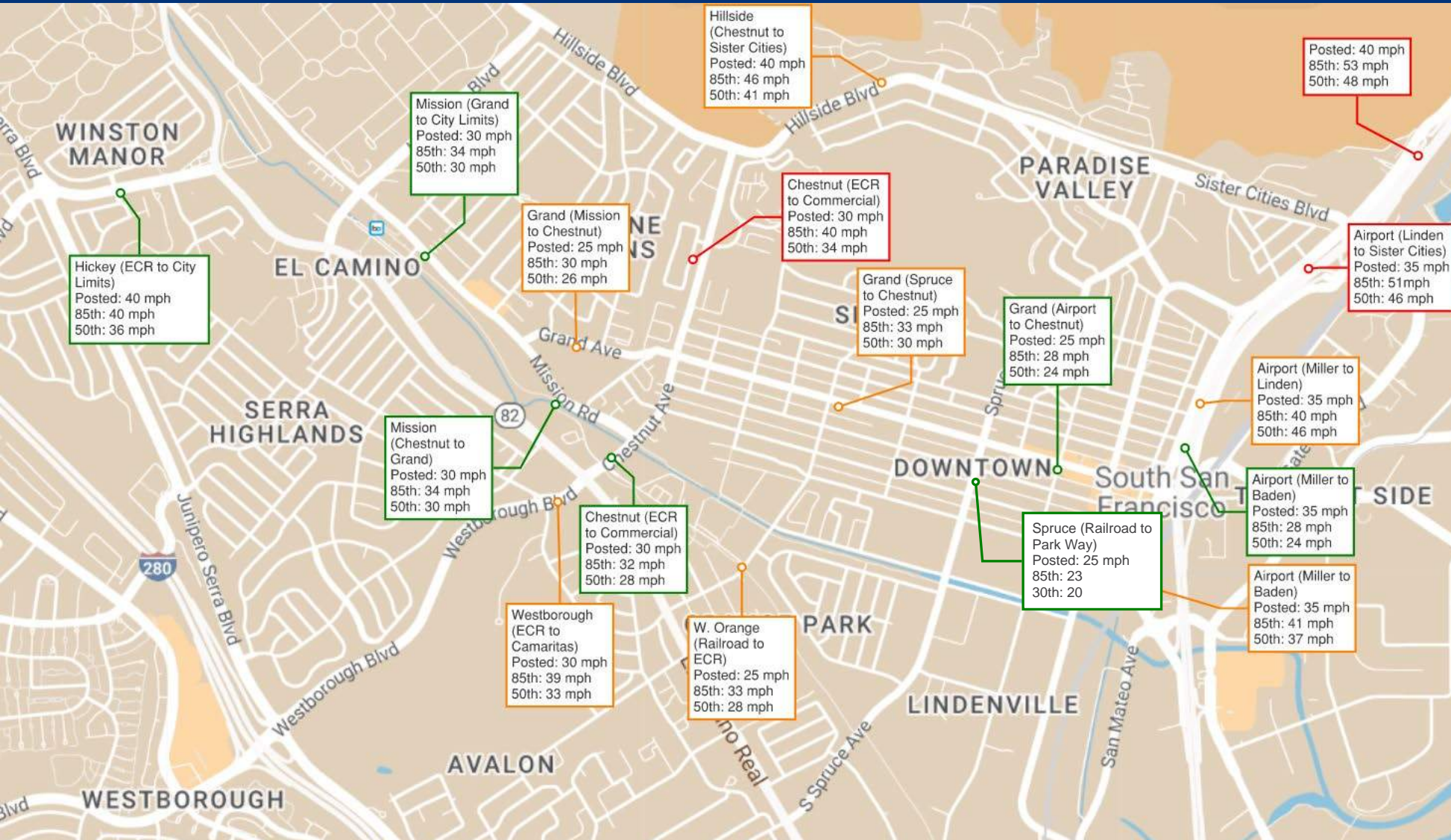


Sources: City of South San Francisco (2019); County of San Mateo (2019); ESRI (2021).

Truck Route

Proposed for Weight Restrictions

Speed Studies



85th percentile speed <5 mph above posted speed

85th percentile speed is more than 4mph and less than 10 mph above posted speed

85th percentile speed is more than 9 mph above posted speed

Data Collection

Collision Data

Transportation Injury Mapping System (TIMS) data collected for five most recent years of available data (2017-2022). Maps of injury collisions by mode.

Parking Occupancy

Collected occupancy data for midday weekday (11am-1pm) and evening weekday (8-9pm)

Bus Speeds

Recorded average bus speeds on transit corridors using Cal ITP

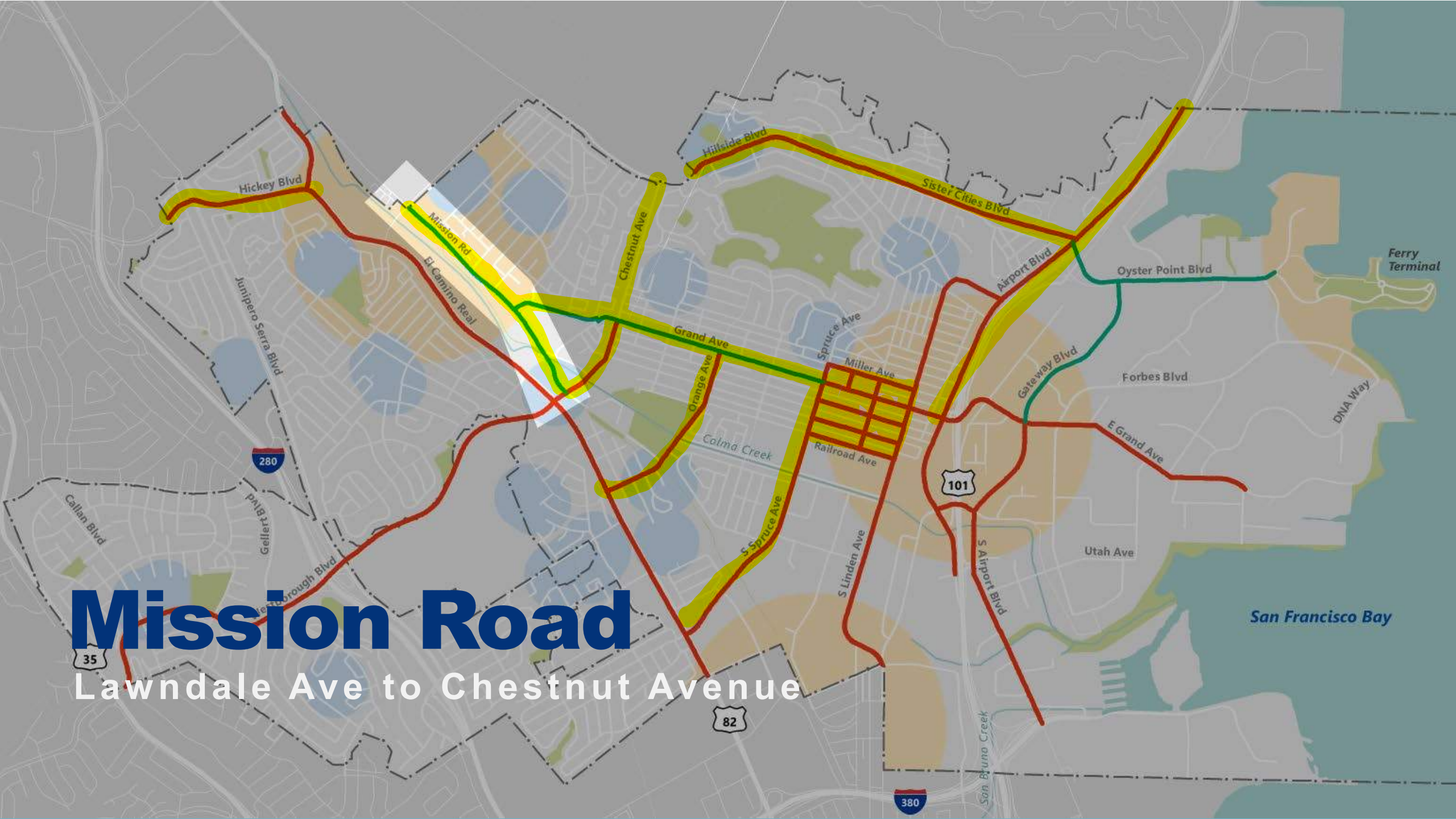
Conditions Index

Inventory of lanes, parking, land use, and unique features of the corridor

Individual Corridor Existing Conditions

Mission Road

Lawndale Ave to Chestnut Avenue



Existing Conditions

Bike Facilities

No existing on-street facilities. Centennial Way Trail runs along south side between BART and Lawndale

Transit

SamTrans Route 130
(15 minute headways)

SamTrans Route 35
(Special school service)

Roadway

4 vehicle lanes

2 signalized intersections

On-Street parking from Sequoia to Evergreen

Land Use

Low- to medium-density residential and commercial. Access to BART station



Vehicle Speeds & Volumes

Bus Speeds (CAL ITP)

SamTrans Route 130, 35

Speeds between 6 – 9 mph between Grand and El Camino Real

Speed Survey

Posted Speed: 30 mph

85th percentile speeds: 34 mph

Volumes

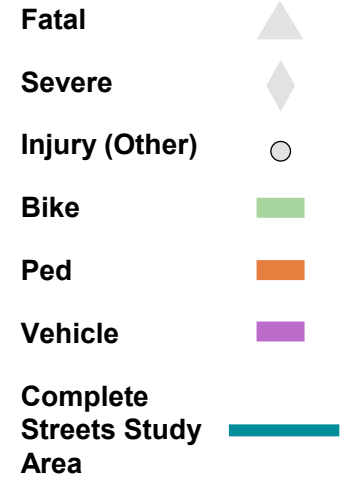
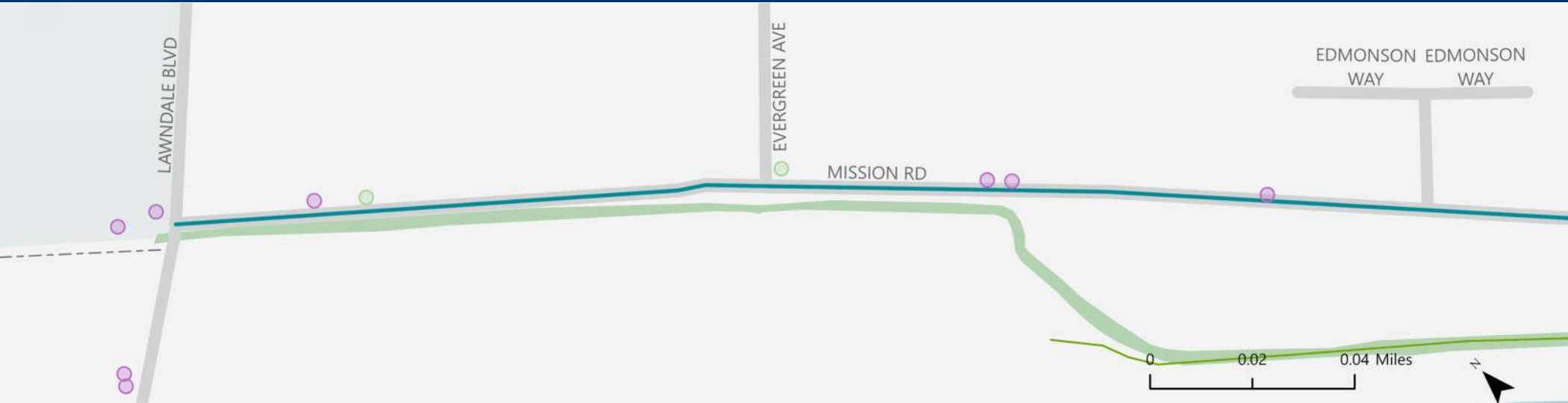
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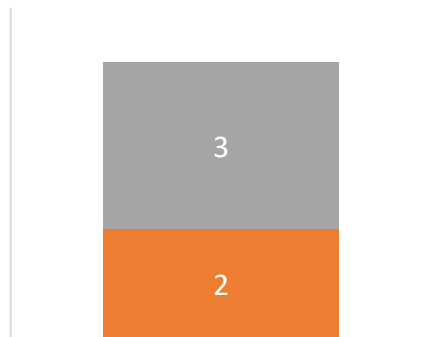
Vehicle Volumes: AM Peak (PM Peak)



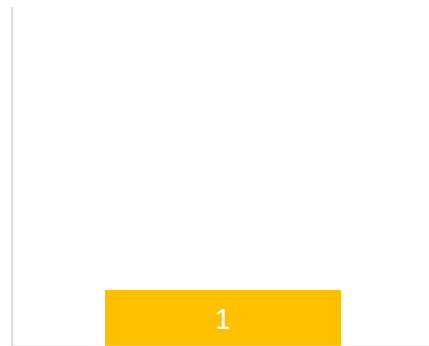
Collision Analysis



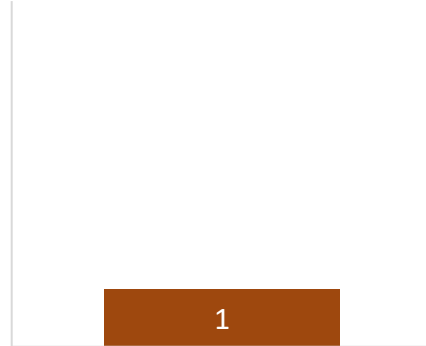
MISSION RD/LAWNDALE BLVD



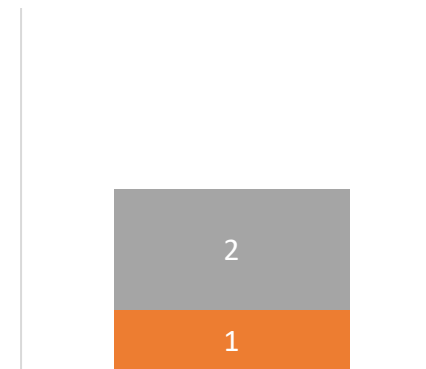
MISSION RD BETWEEN LAWNDALE BLVD AND EVERGREEN AVE



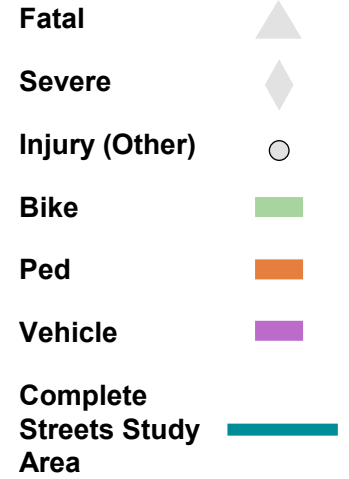
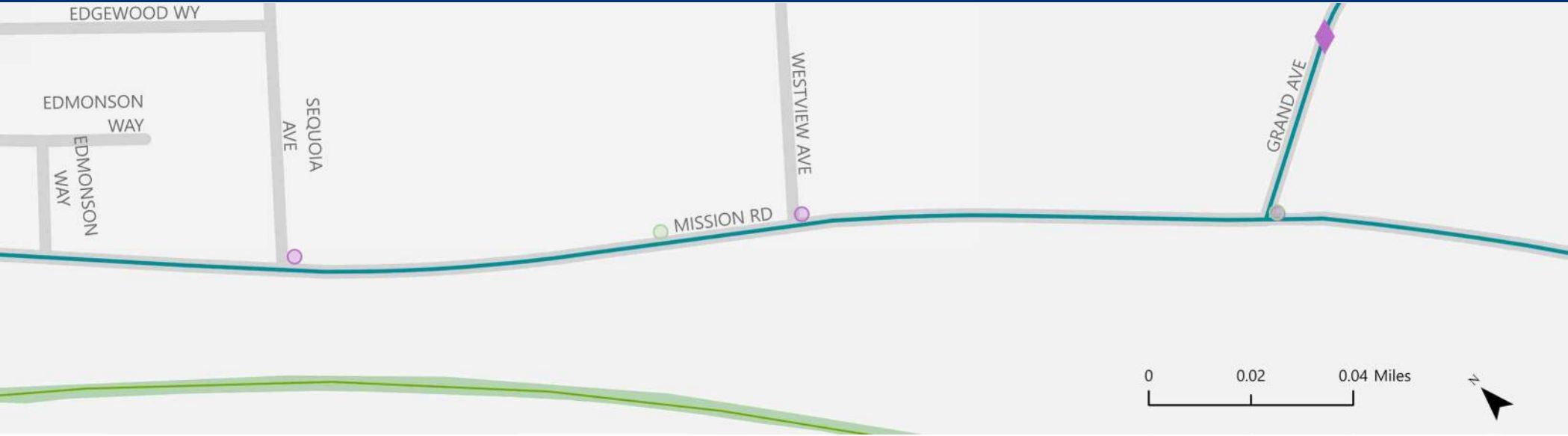
EVERGREEN AVE/MISSION RD



MISSION RD BETWEEN EVERGREEN AVE AND EDMONSON WAY



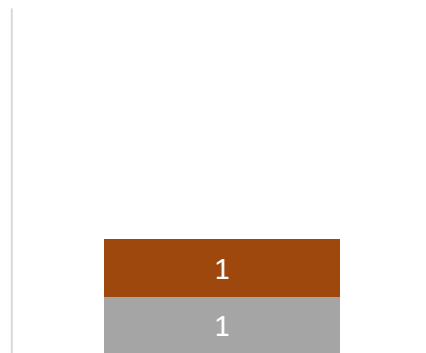
Collision Analysis



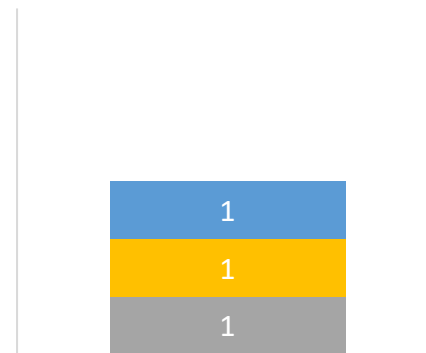
MISSION RD/SEQUOIA AVE



MISSION RD/WESTVIEW AVE



MISSION RD/GRAND AVE



Parking Occupancy

Block	North Side				South Side				Notes		
	Spaces	11AM-1PM		8-9PM		Spaces	11AM-1PM			8-9PM	
Sequoia to Evergreen	24	16	67%	18	75%	0	N/A	N/A	N/A	N/A	

Active South City Plan (2022)

Bike Facilities:

Level of Traffic Stress
IV
Recommend Class IIB
Buffered Bike Lanes
between Chestnut and
Lawndale

Intersection Spot Treatments:

Lawndale

Upgrade all crosswalks to high-visibility crosswalks. Construct curb extensions at all four corners. Provide leading pedestrian intervals for all crossings. Construct sidewalks on the west side of McLellan south of Mission Rd.

Sequoia

Install a crosswalk on the northern approach. Upgrade all crosswalks to high-visibility crosswalks. Construct curb extensions.

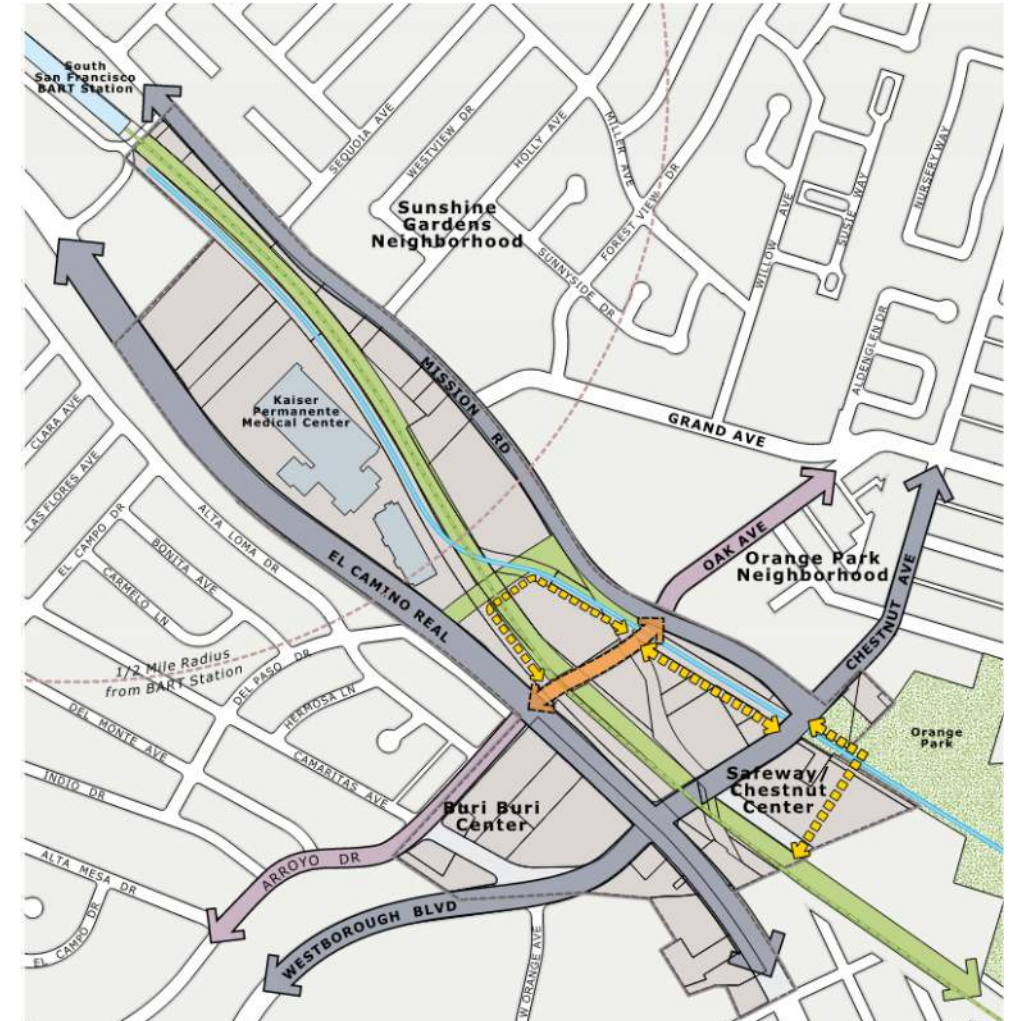
Grand

Upgrade both crosswalks to high-visibility crosswalks. Extend medians and create pedestrian refuge islands.

Other Plans: Oak Ave Connection

Proposed Changes

- General Plan identified a need to add a north/south connection between El Camino Real and Mission Road via Oak Avenue
- Still at planning level
- Will provide connection across El Camino Real for people biking and walking



General Plan

Proposed Roadway Network

Roadway Type: collector

Transit Priority Corridor

Truck Route

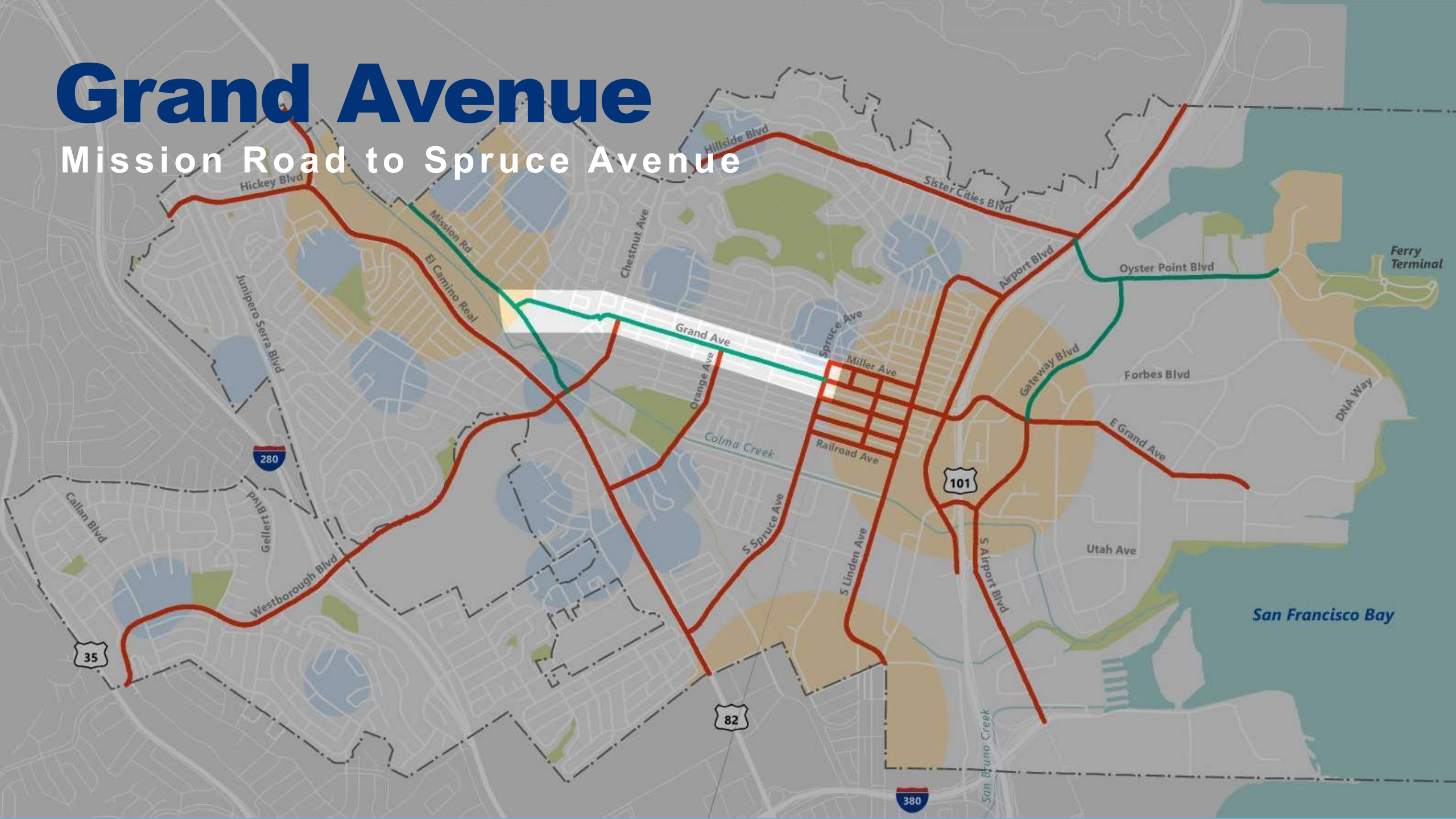
Land Use Changes

Medium Density Mixed-Use

Regional Transit Access to South San Francisco BART Station (Transit Oriented Development)

Grand Avenue

Mission Road to Spruce Avenue



Existing Conditions

Bike Facilities

- Class IIB buffered bike lanes from Chestnut Ave to Spruce Ave

Roadway

- 2 vehicle lanes
- On-Street parking on both sides of the street

Transit

- SamTrans Route 130 (15 minute headways)
- SamTrans Route 37 (Special school service)

Land Use

- Low- to medium- density residential



Vehicle Speeds and Volumes

Bus Speeds (CAL ITP)

SamTrans Route 130, 37

Speeds between 6 – 15 mph westbound

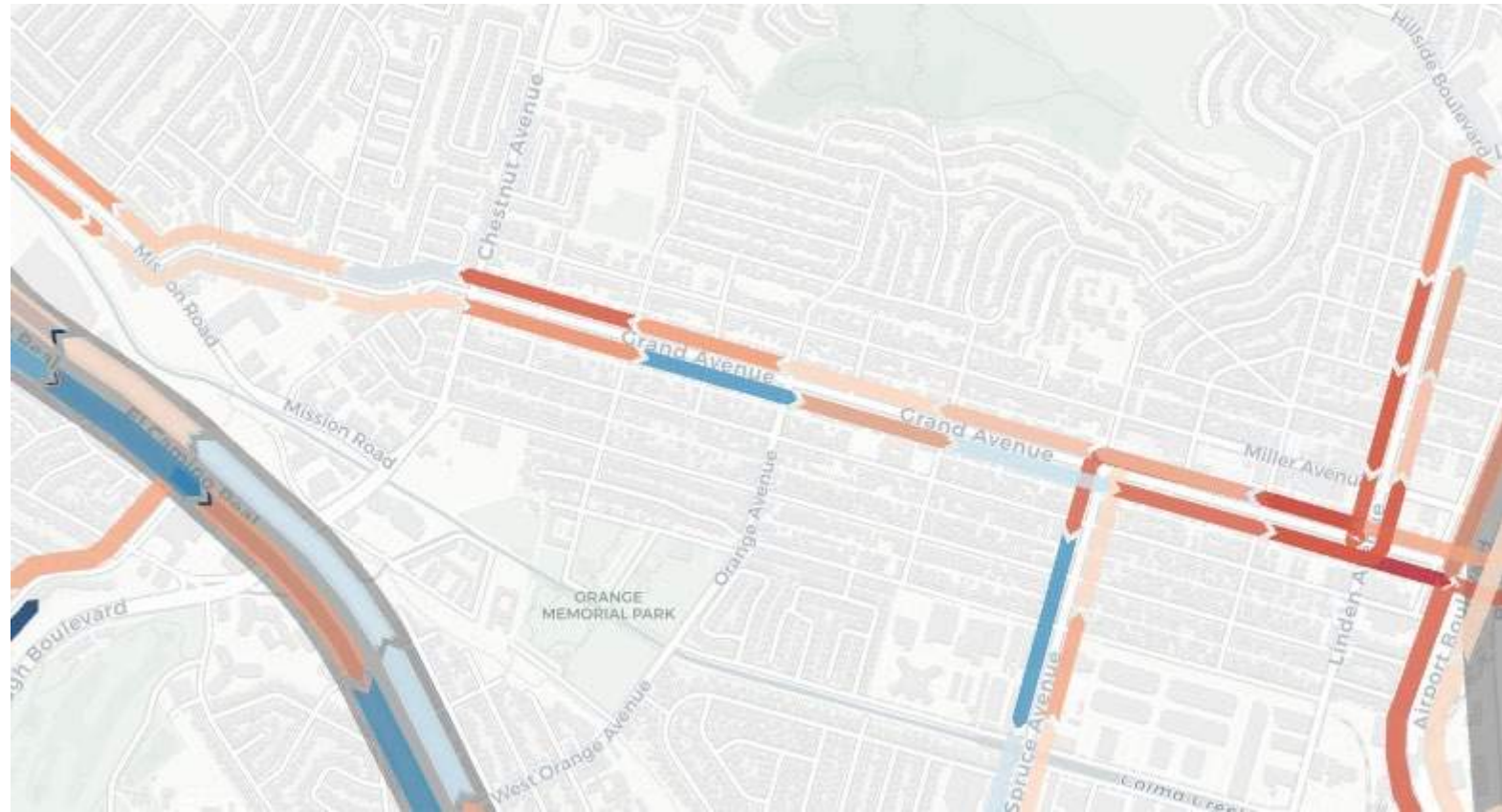
Speed Survey

Posted Speed: 25 mph

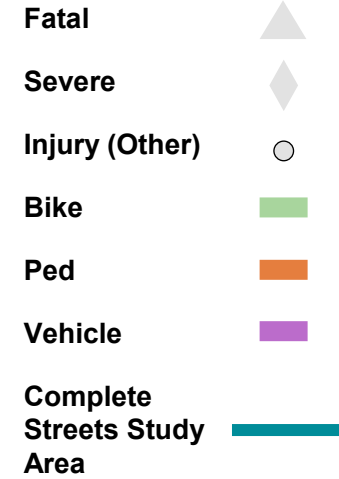
85th percentile speeds: 30-33 mph

Volumes

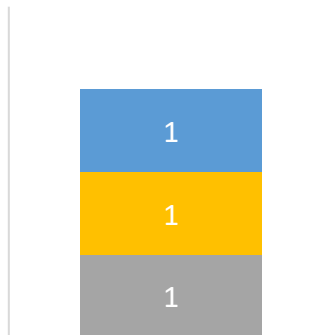
ADT: 6,800



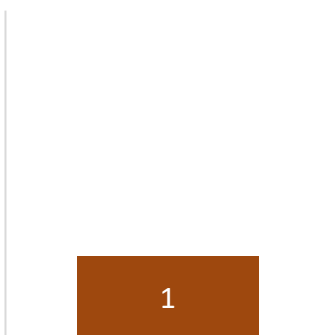
Collision Analysis



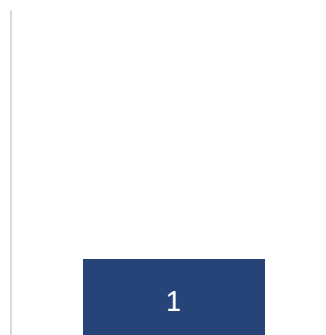
MISSION RD/GRAND AVE



FOREST VIEW DR/GRAND AVE



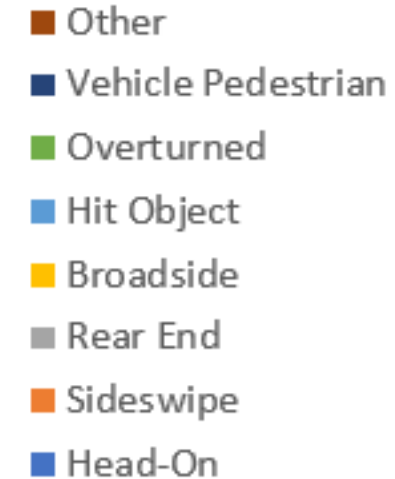
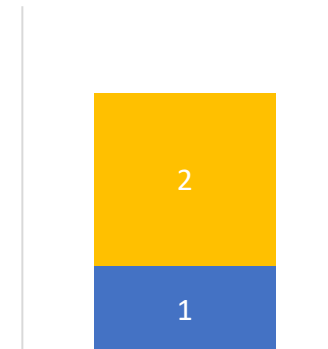
WILLOW AVE/GRAND AVE



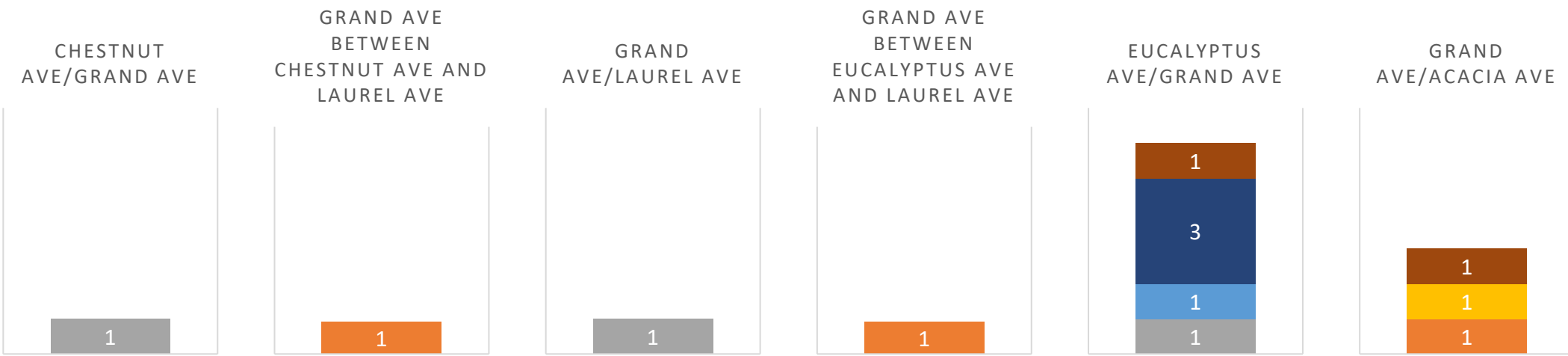
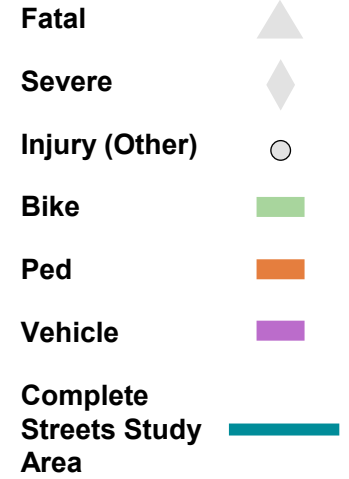
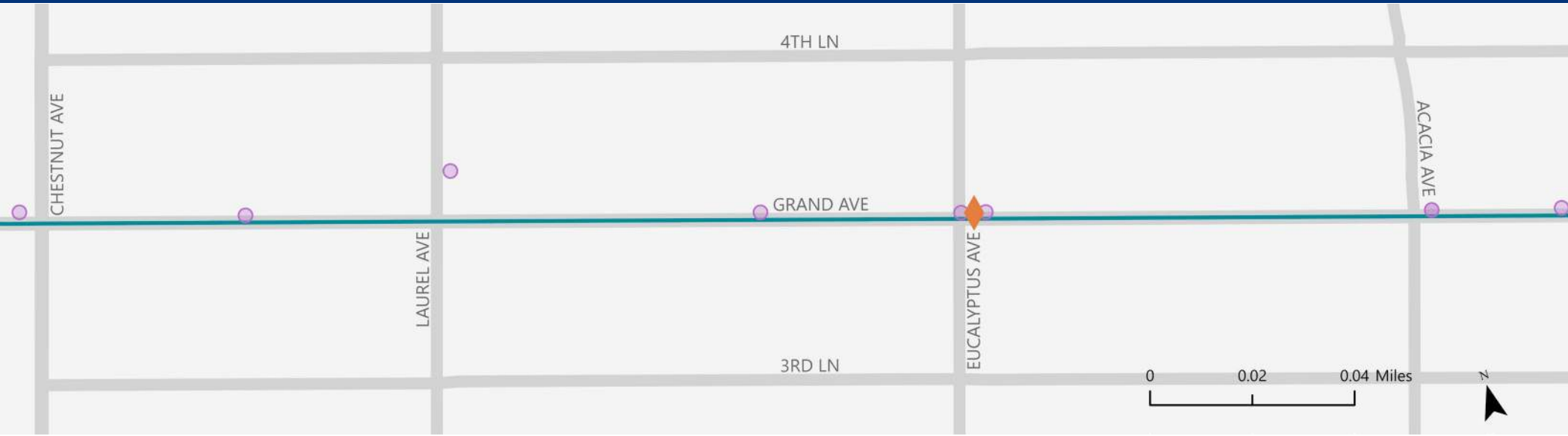
GRAND AVE BETWEEN WILLOW AVE AND ALDENGLEN DR



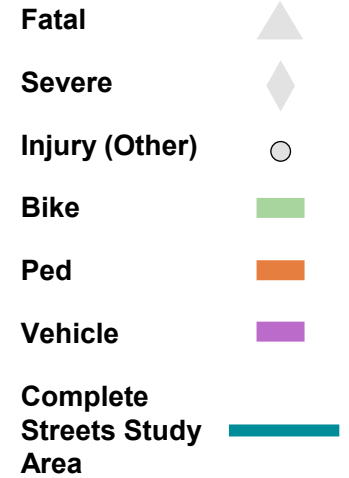
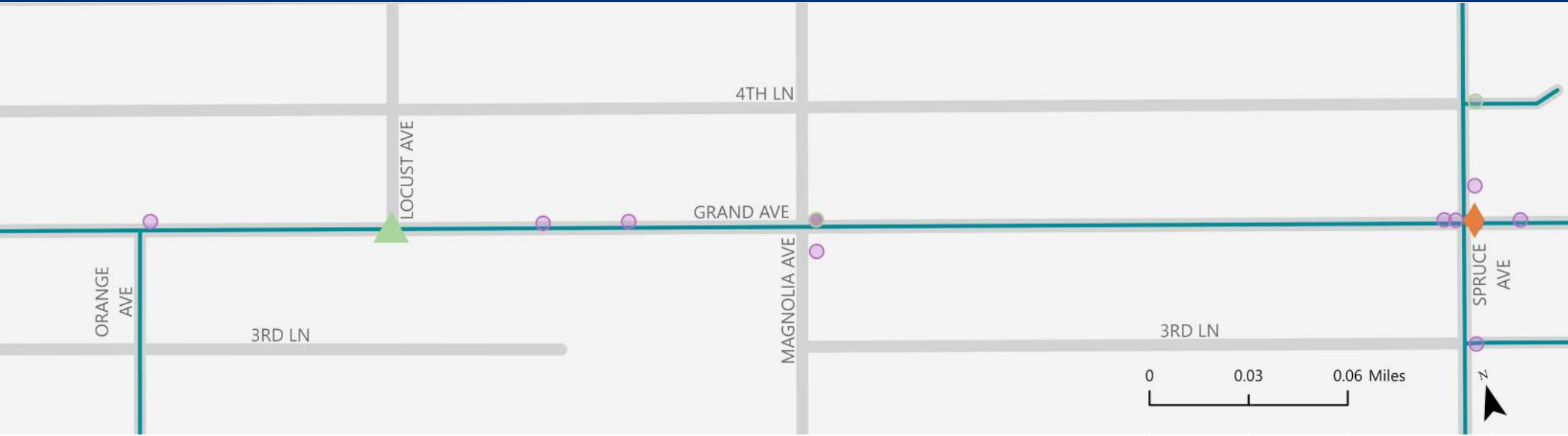
OAK AVE/GRAND AVE



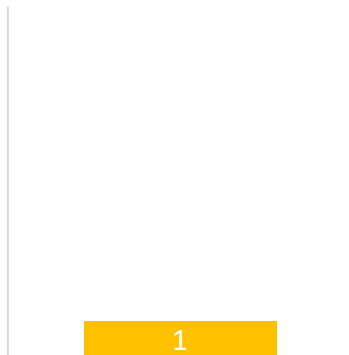
Collision Analysis



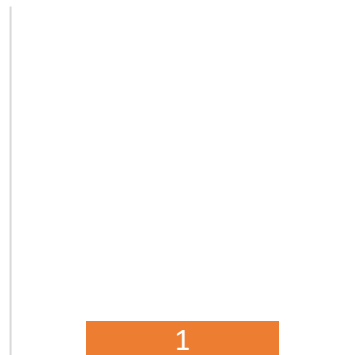
Collision Analysis



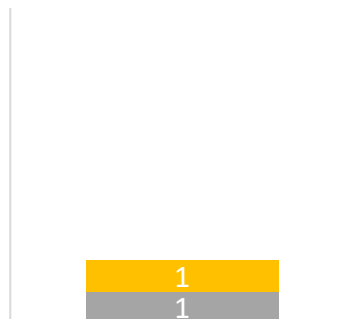
ORANGE AVE/GRAND AVE



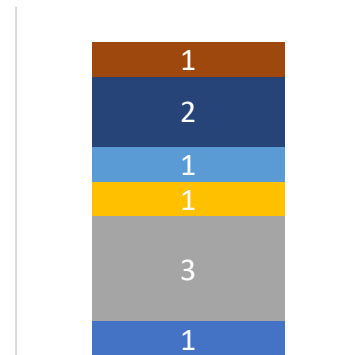
GRAND AVE/LOCUST AVE



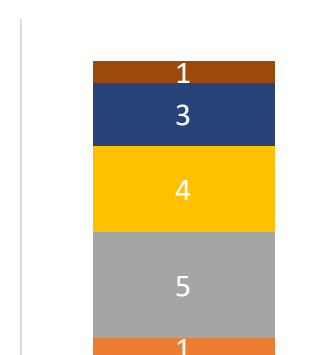
GRAND AVE BETWEEN LOCUST AVE AND MAGNOLIA AVE



GRAND AVE/MAGNOLIA AVE



SPRUCE AVE/GRAND AVE



Parking Occupancy

Block	North Side				South Side				Notes		
	Spaces	11AM-1PM		8-9PM		Spaces	11AM-1PM			8-9PM	
Spruce to Magnolia	28	21	75%	28	100%	34	25	74%	30	88%	
Magnolia to Orange	34	18	53%	34	100%	29	22	76%	29	100%	
Orange to Acacia	14	11	79%	12	86%	17	5	29%	11	65%	
Acacia to Eucalyptus	20	11	55%	15	75%	19	8	42%	12	63%	
Eucalyptus to Laurel	20	9	45%	15	75%	14	6	43%	14	100%	
Laurel to Chestnut	16	10	63%	13	81%	17	5	29%	8	47%	
Oak to Willow	13	4	31%	13	100%	14	11	79%	11	79%	
Willow to Mission	19	17	89%	19	100%	26	23	88%	27	104%	

Active South City Plan (2022)

Bike Facilities:

Level of Traffic Stress
3 to 4

Recommend Class IV
Protected Bike Lanes

Intersection Spot Treatments:

Willow

Consider improvements such as curb extensions, signage & lighting, crosswalks & curb ramps, pedestrian crossing beacons, conflict markings & advance stop/yield markings, and red curb

Orange

Upgrade all crosswalks to high-visibility crosswalks. Consider installing curb extensions at all four corners. Provide a leading pedestrian interval for the crossings of Grand Avenue.

Magnolia

Consider improvements such as curb extensions, no right turn on red, crosswalks & curb ramps, slip lane removal, leading pedestrian intervals, conflict markings, bicycle detection, signage & lighting, crossing guards/traffic control, pedestrian-only phasing, extended crossing times, and/or traffic circles

General Plan

Proposed Roadway Network

Roadway Type: collector

Transit Priority Corridor

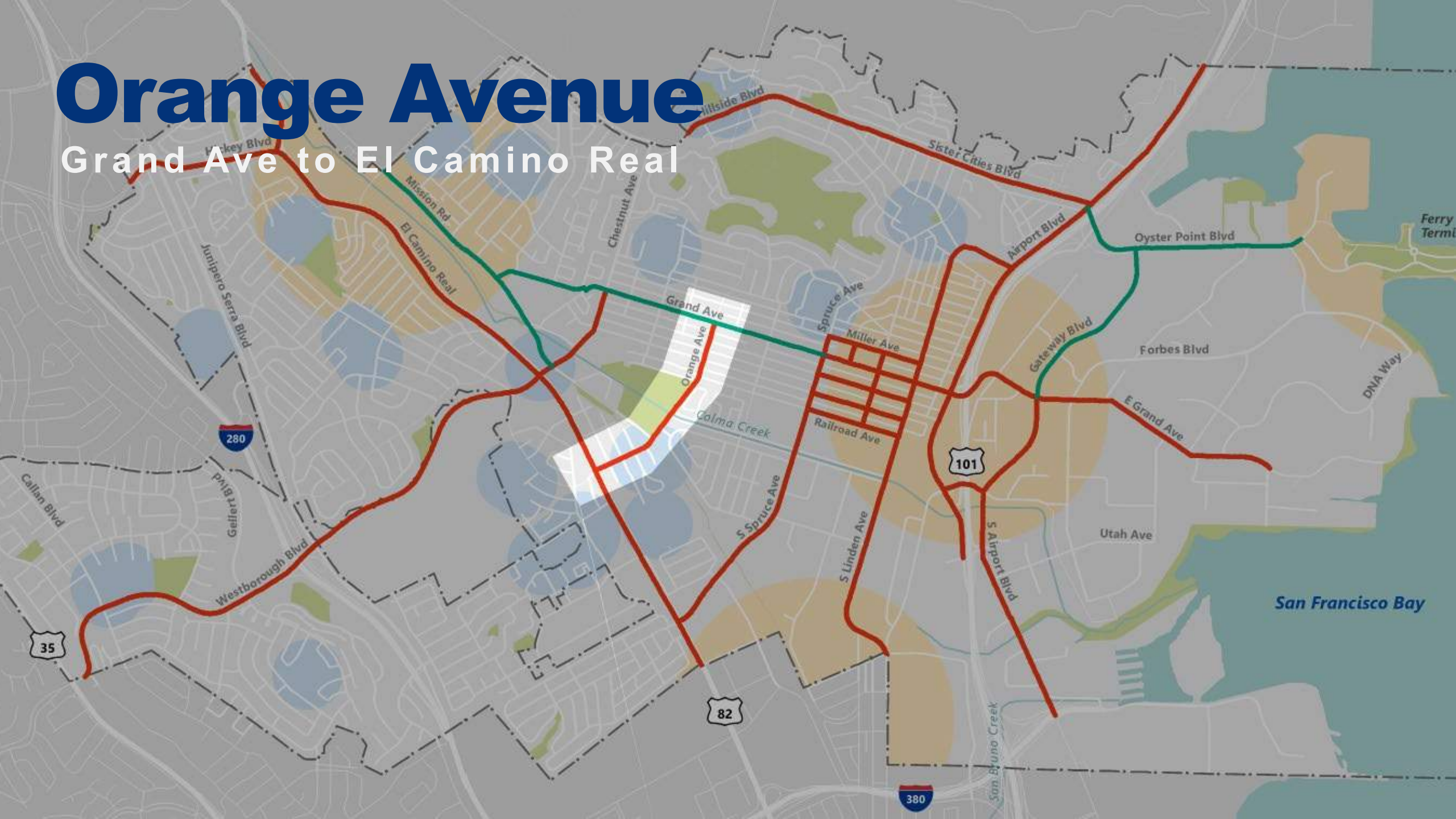
Not a truck Route

Land Use Changes

Medium to Medium-High Density Residential

Orange Avenue

Grand Ave to El Camino Real



Existing Conditions

Bike Facilities

- Class II bike lanes from Railroad Ave to Centennial Way Trail
- Class III shared lane markings on north and south end

Roadway

- 2 vehicle lanes
- On-Street parking on both sides of the street

Transit

- SamTrans Route 37 (Special school service)
- SSF Shuttle Counter Clockwise Service (40 minute headways)

Land Use

- Low- to medium- density residential
- Orange Memorial Park, Los Cerritos Elementary



Orange Ave

Vehicle Speeds and Volumes

Bus Speeds (CAL ITP)

Not Available

Speed Surveys:

Posted: 25 mph

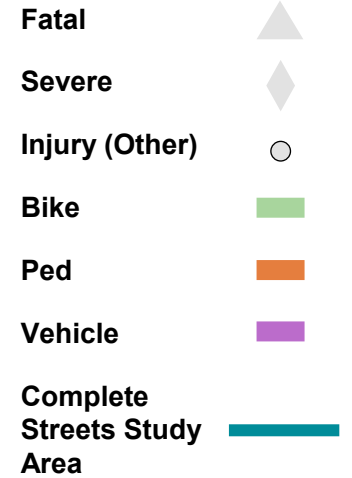
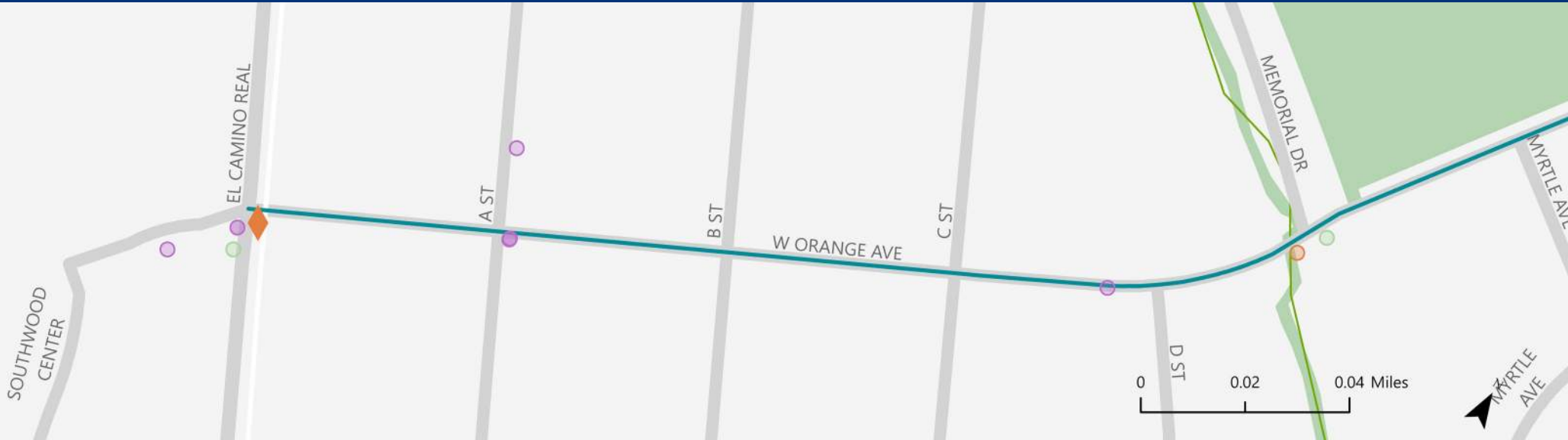
85th Percentile: 33mph

Volumes

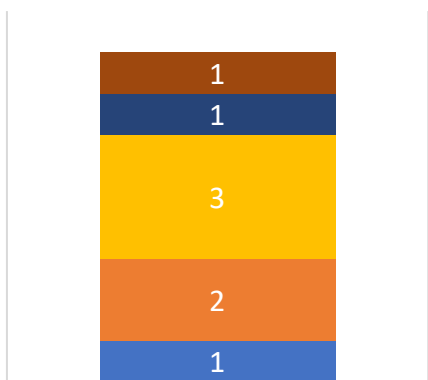
ADT: 8,600



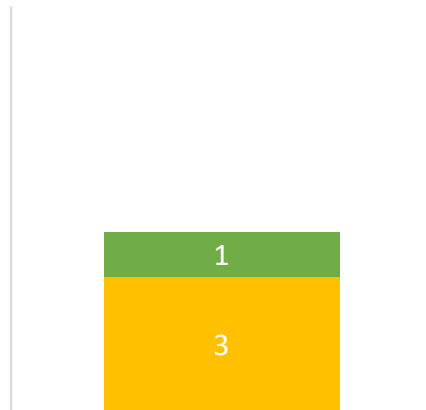
Collision Analysis



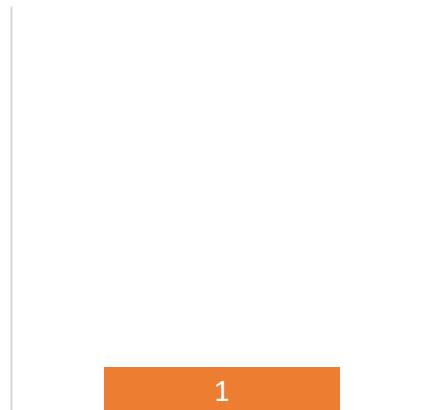
EL CAMINO REAL/W ORANGE AVE



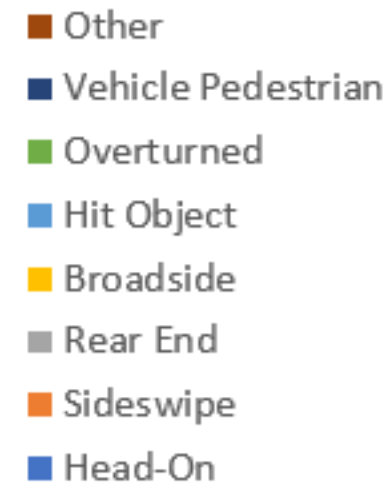
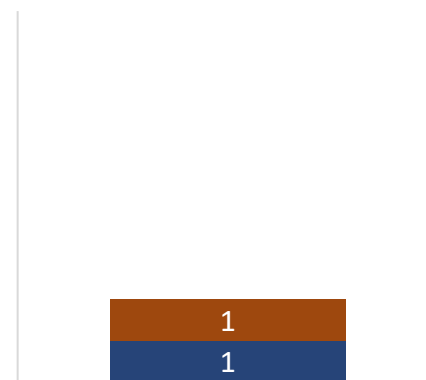
A ST/W ORANGE AVE



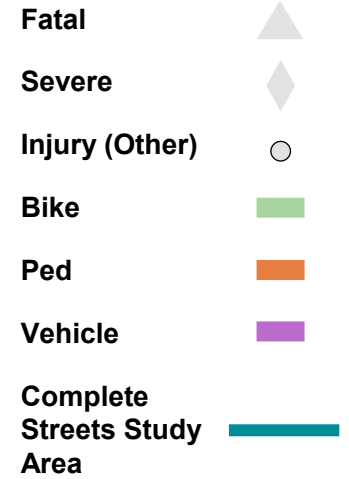
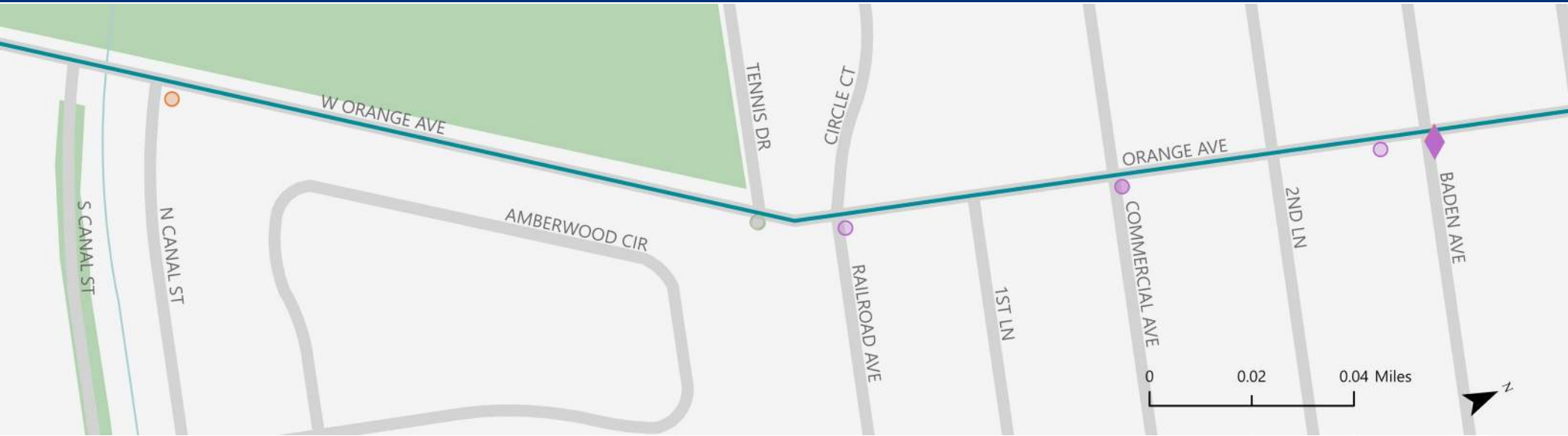
W ORANGE AVE/D ST



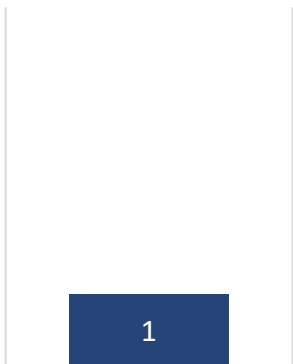
W ORANGE AVE/MEMORIAL DR



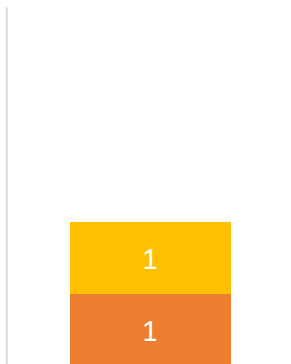
Collision Analysis



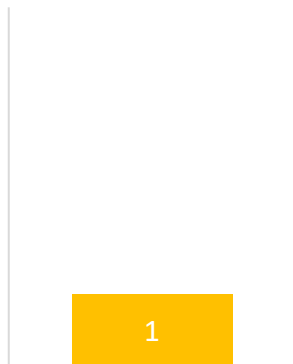
N CANAL ST/W ORANGE AVE



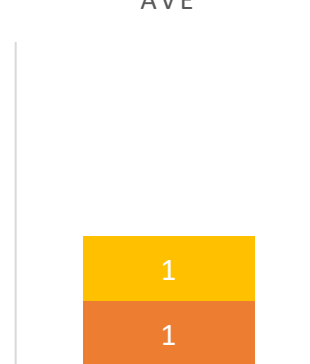
TENNIS DR/W ORANGE AVE



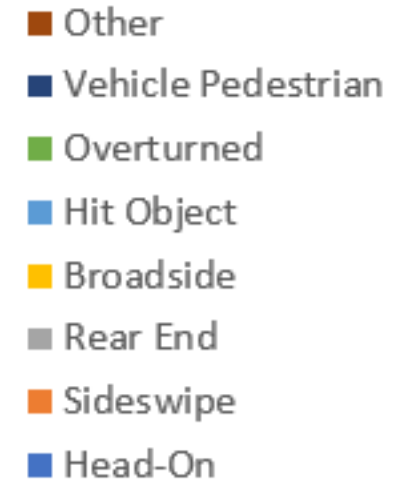
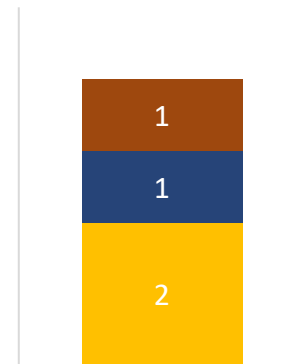
ORANGE AVE/RAILROAD AVE



ORANGE AVE/COMMERCIAL AVE



ORANGE AVE/BADEN AVE



Parking Occupancy

Block	East Side				West Side				Notes		
	Spaces	11AM-1PM	8-9PM	Spaces	11AM-1PM	8-9PM					
A to C	7	6	86%	7	100%	10	7	70%	10	100%	
C to Memorial	4	0	0%	3	75%	5	0	0%	1	20%	
Memorial to N Canal	18	9	50%	13	72%	15	9	60%	4	27%	Daytime: food truck activity on west side
N Canal to Railroad	24	5	21%	6	25%	24	10	42%	4	17%	
Railroad to Commercial	8	4	50%	5	63%	7	6	86%	7	100%	
Commerical to Baden	8	7	88%	8	100%	8	4	50%	8	100%	
Baden to Grand	8	7	88%	6	75%	8	8	100%	8	100%	

Active South City Plan (2022)

Bike Facilities:

Level of Traffic Stress
3
Recommend Class
IIIB bike boulevard for
most of the corridor.
Class IIB adjacent to
Orange Memorial Park

Intersection Spot Treatments:

Baden

Consider improvements
such as curb
extensions, signage &
lighting, crosswalks &
curb ramps, pedestrian
crossing beacons,
conflict markings &
advance stop/yield
markings, and red curb

Railroad

Upgrade the transverse
crosswalk across
Railroad Avenue to
high-visibility and
construct a curb
extension at the
southeast corner

C and B

Consider crossing
improvements such as
high-visibility
crosswalk, RRFB or
HAWK signals, curb
extensions, and/or
pavement markings

Active South City Plan (2022)

Intersection Spot Treatments:

A

Consider improvements such as curb extensions, signage & lighting, crosswalks & curb ramps, pedestrian crossing beacons, conflict markings & advance stop/yield markings, red curb, crossing guards/traffic control, leading pedestrian intervals, pedestrian-only phases, and extended crossing time

El Camino Real

Consider improvements such as curb extensions, signage & lighting, crosswalks & curb ramps, pedestrian crossing beacons, conflict markings & advance stop/yield markings, red curb, crossing guards/traffic control, leading pedestrian intervals, pedestrian-only phases, and extended crossing time

General Plan

Proposed Roadway Network

Roadway Type: collector

Not a transit priority corridor

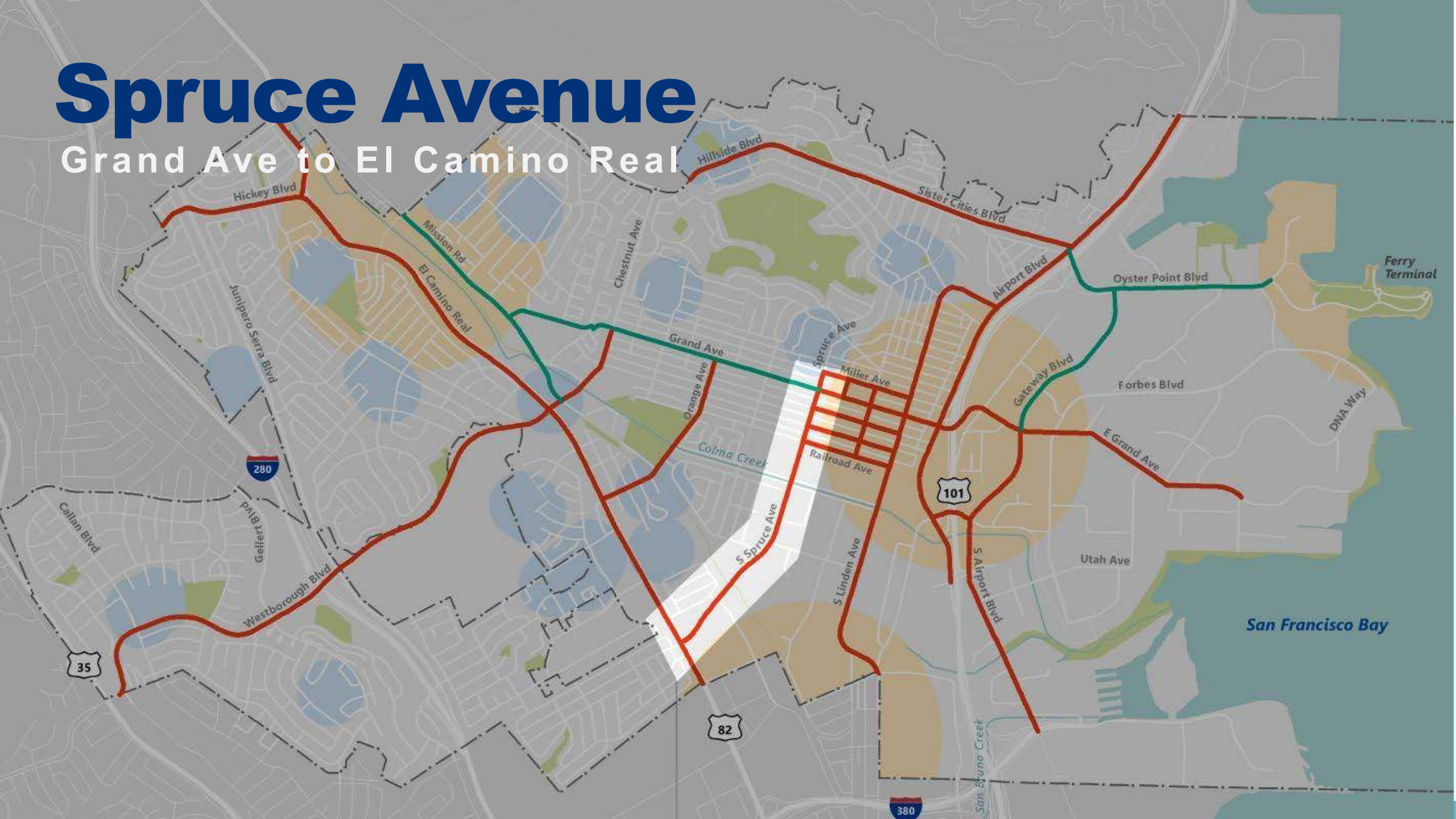
Not a truck Route

Land Use Changes

Range of residential densities: medium-high density toward the downtown core, low density near the park.

Spruce Avenue

Grand Ave to El Camino Real



Existing Conditions

Bike Facilities

- No existing facilities

Roadway

- 2 vehicle lanes
- On-Street parking on both sides of the street

Transit

- SamTrans Route 141 (30-minute headways)

Land Use

- Low- to medium- density residential on the north end
- Industrial and commercial on the south end



Vehicle Speeds and Volumes

Bus Speeds (CAL ITP)

SamTrans Route 141

Speeds between 15 – 24 mph

Speed Surveys:

Posted: 30 mph

85th Percentile: 33-37 mph

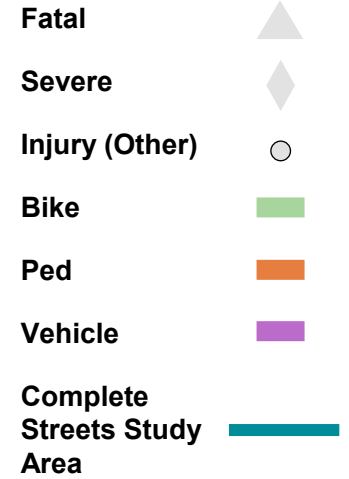
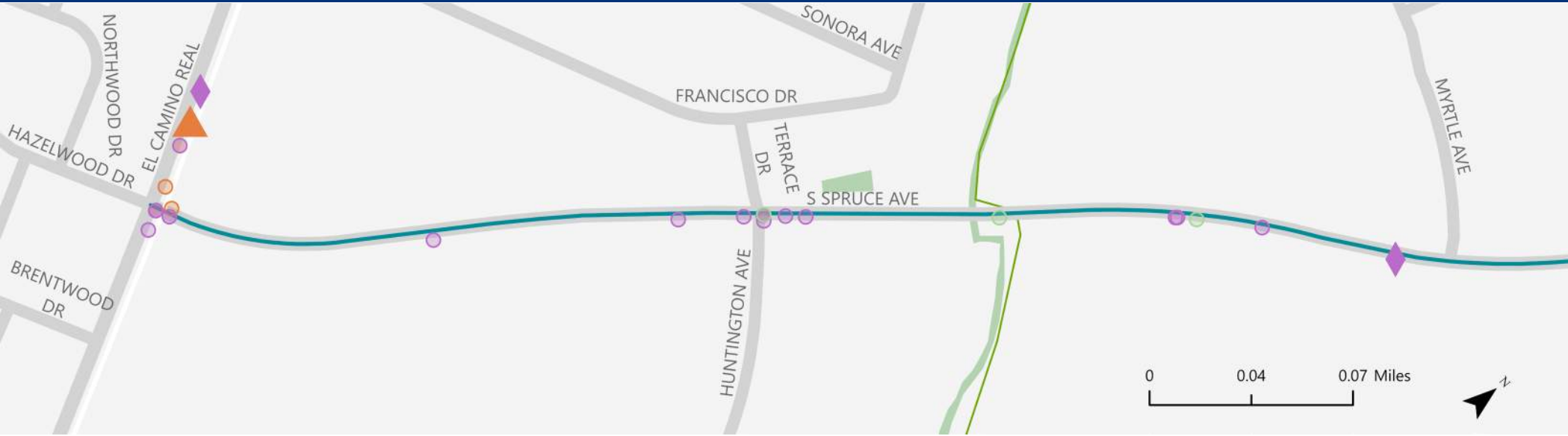
Volumes

ADT (northern end): 7,900

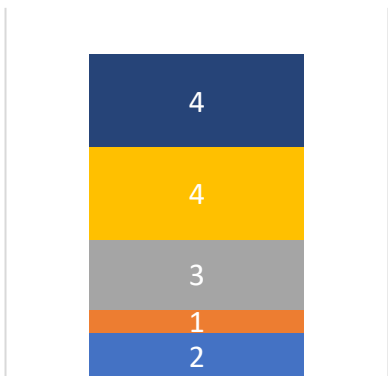
ADT (southern end): 20,400



Collision Analysis



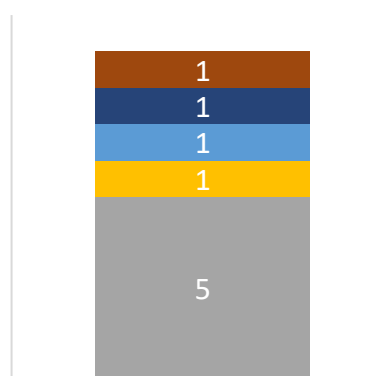
EL CAMINO REAL/HAZELWOOD DR



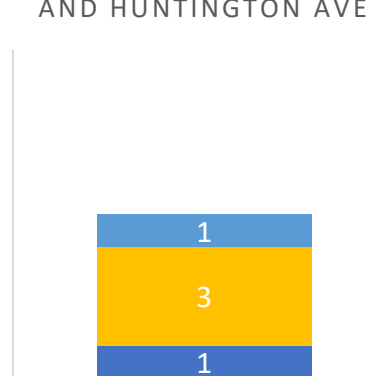
SOUTH SPRUCE AVE BETWEEN HUNTINGTON AVE AND EL CAMINO REAL



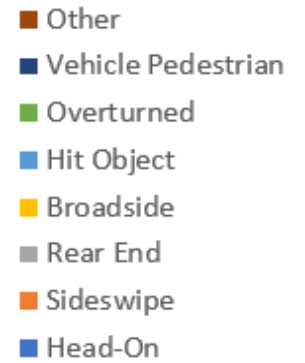
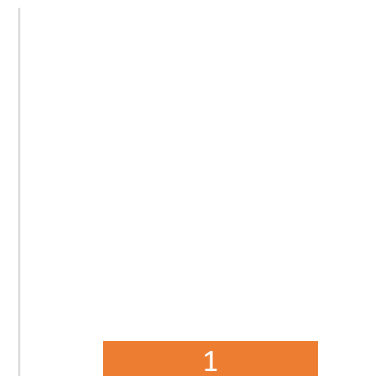
S SPRUCE AVE/TERRACE DR



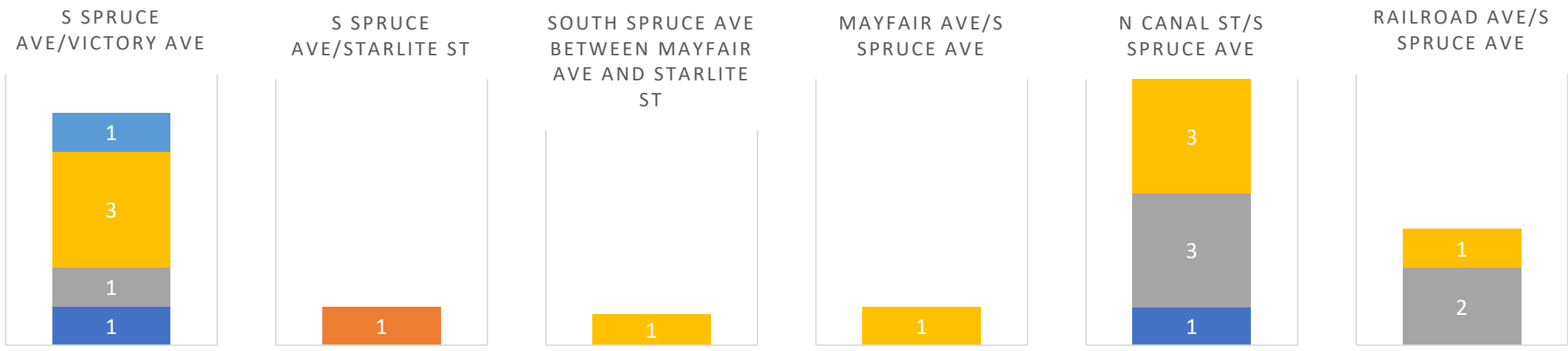
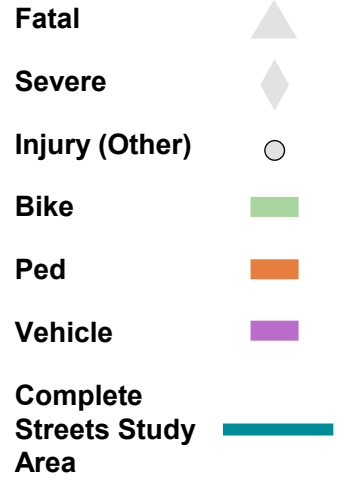
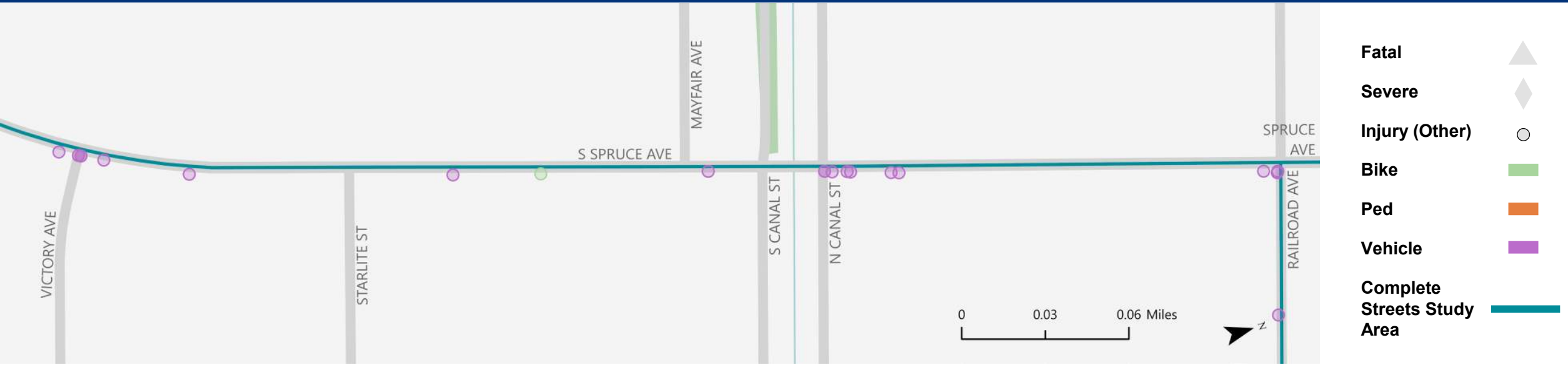
SOUTH SPRUCE AVE BETWEEN MYRTLE AVE AND HUNTINGTON AVE



S SPRUCE AVE/MYRTLE AVE



Collision Analysis



Parking Occupancy

Block	East Side				West Side				Notes		
	Spaces	11AM-1PM	8-9PM	Spaces	11AM-1PM	8-9PM					
Railroad to Commercial	7	4	57%	7	100%	5	1	20%	5	100%	Parking in front of driveways at night
Commercial to Baden	9	9	100%	9	100%	6	5	83%	6	100%	
Baden to Grand	8	5	63%	7	88%	8	2	25%	5	63%	

Active South City Plan (2022)

Bike Facilities:

Level of Traffic Stress 4

Recommend Class IV
Protected Bike Lanes

Intersection Spot Treatments:

Baden

Consider improvements such as curb extensions, no right turn on red, crosswalks & curb ramps, slip lane removal, leading pedestrian intervals, conflict markings, bicycle detection, signage & lighting, and/or traffic circles

Commercial

Consider improvements such as curb extensions, signage & lighting, crosswalks & curb ramps, pedestrian crossing beacons, conflict markings & advance stop/yield markings, and red curb

Active South City Plan (2022)

Intersection Spot Treatments:

N. Canal

Build curb extensions at the two northern corners. Straighten and upgrade all three marked crosswalks to high-visibility crosswalks.

Huntington

Consider improvements such as curb extensions, no right turn on red, crosswalks & curb ramps, slip lane removal, leading pedestrian intervals, conflict markings, bicycle detection, signage & lighting, and/or traffic circles

El Camino Real

Upgrade all four crosswalks to high-visibility crosswalks. Construct pedestrian refuge islands for the two ECR crossings. Provide a leading pedestrian interval for the ECR crossings. Consider curb extensions at all four corners.

Lindenville Specific Plan (2023)

S Spruce Ave

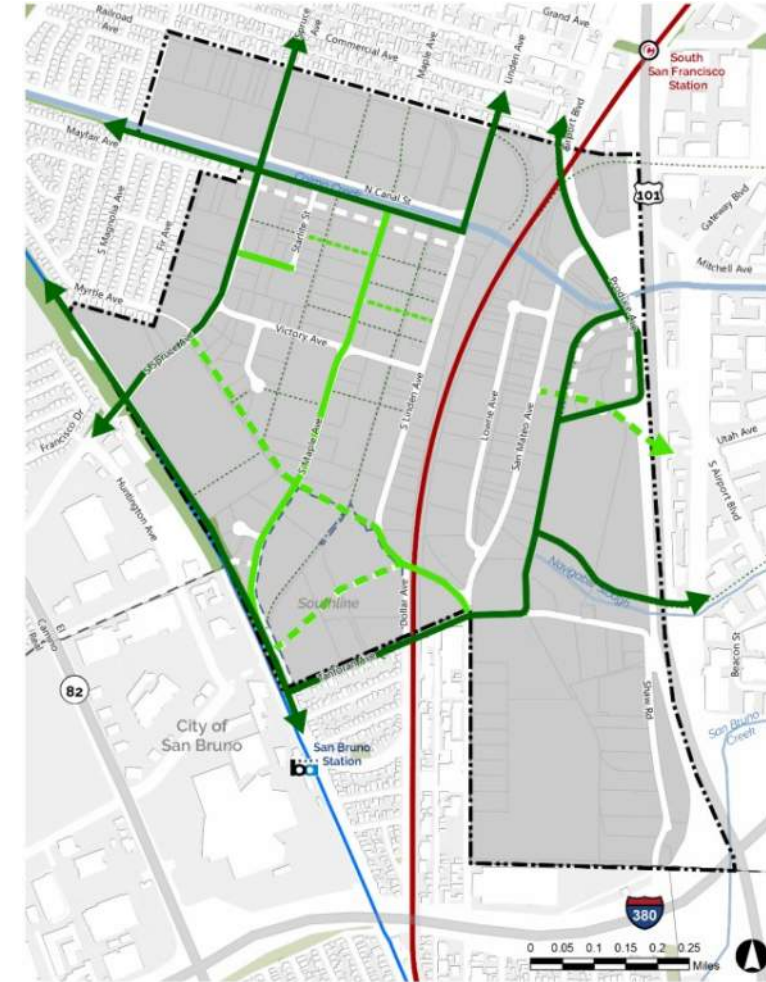
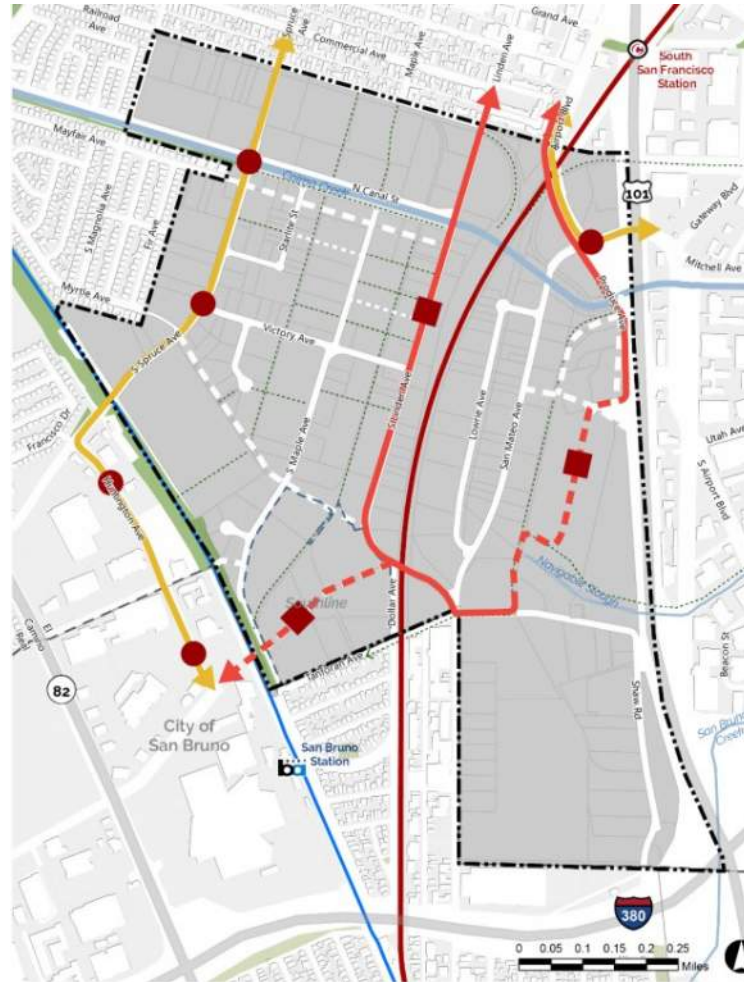
- One of two primary corridors that connect Lindenville to Downtown SSF and San Bruno

Proposed Land Uses

- S Spruce: High density mixed-use (east side), medium density mixed use (west side)

Policy MOB 3.5

- Encourage mode shift and overhaul transportation experience on S Spruce Ave by converting some parking to parklets and pick-up/drop-off zones



Lindenville Specific Plan (2023)

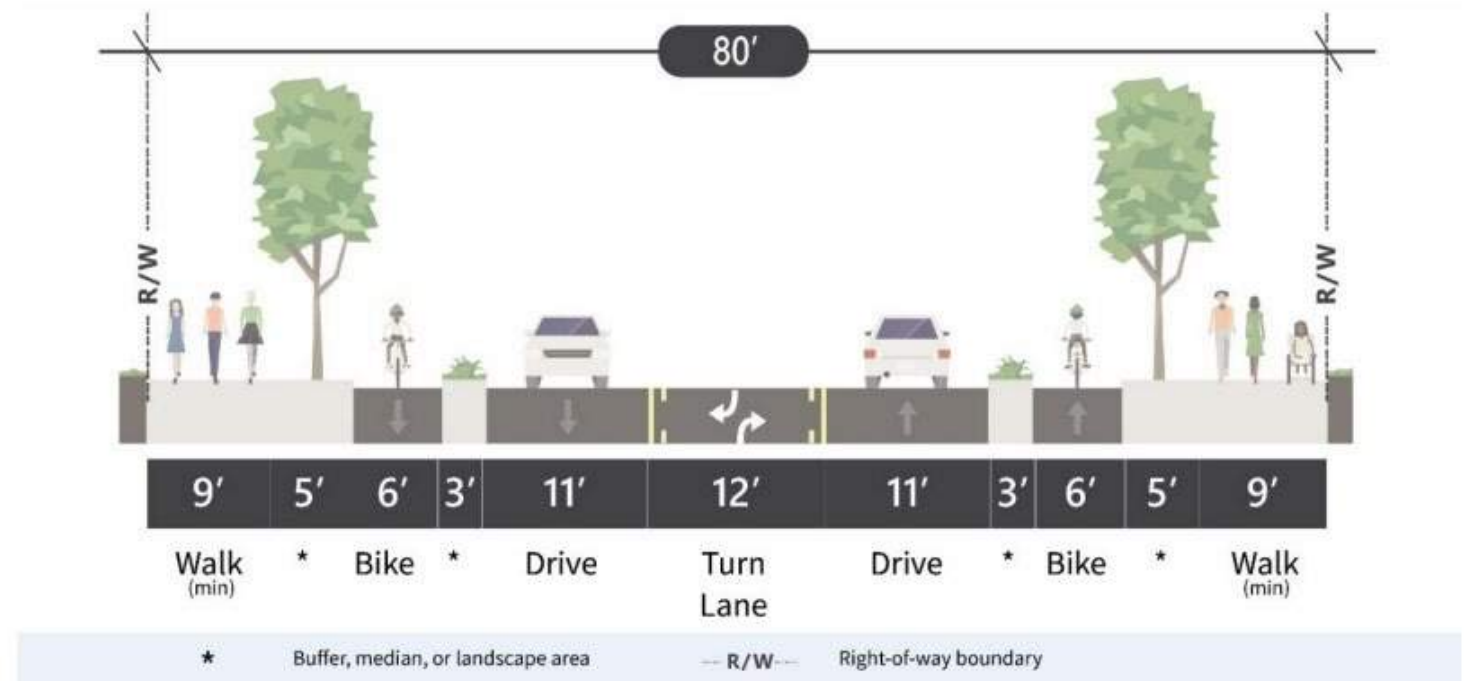
Pedestrian Priority Streets

- S Spruce is a pedestrian priority street which will have wider sidewalks (12-15'), landscaping, curb extensions, and other traffic calming features

Bicycle Priority Streets

- S Spruce designated as backbone route which will have either class I or class IV bike facility

Figure 33: Proposed Cross Section – South Spruce Avenue



Local Roadway Safety Plan (2022)


Project Recommendation for Spruce & N Canal Intersection

- Signal upgrades to include mast arms, reflective backplates,
- Striping changes to include advanced stop bars and high visibility crossings

South San Francisco Local Road Safety Plan
Project Description for Intersection Improvements

Location: Spruce Ave and N Canal St
Agency Name: City of South San Francisco
Contact Name: Chou, Jeffrey
E-mail: Jeffrey.Chou@ssf.net

Signalized Intersection



Total Crashes	19
Local CCR Differential	0.38
Equivalent Property Damage Only	251
Fatal	0
Major Injury	1
Minor Injury	7
PDO	11
Crash Type	
Broadside	5
Sideswipe	4
Rear End	3
Head On	1
Hit Object	1
Overtumed	0
Non-Motorist Crashes	
Pedestrian	0
Bicycle	1
Contributing Factors	
Aggressive	2
Impaired	1
Crash Conditions	
Dark	0
Wet	0

NOTES	COLLISION TYPE	RECOMMENDATION	LRSM/CMF COUNTERMEASURE	LRSM #	Expected Life (Years)	CMF	CALTRANS FUNDING	NUMBER OF CRASHES (2015-2019)				10-YEAR CRASH REDUCTION ESTIMATE	10-YEAR CRASH REDUCTION BENEFIT (2016 \$)	TOTAL 10-YEAR CRASH REDUCTION BENEFIT (2016 \$)	QUANTITY/ NUMBER OF UNITS	UNIT COST	HSIP COST ESTIMATE	BENEFIT/COST
								Fatal	Major Injury	Minor Injury	PDO							
-	All	Install Retroreflective Backplates	Improve signal hardware: lenses, back-plates with retroreflective borders, mounting, size, and number	S02	10	0.85	100%	0	1	7	11	0.00	\$ -	\$ 819,722	14 Backplates	\$750	\$10,500	78.1
								1	1.05	2.10	3.30	\$ 477,000						
								7	1.65	3.30	0.00	\$ 298,832						
								11	0.00	0.00	0.00	\$ 43,890						
-	Pedestrian and Bicycle	Install advanced stop bar	Install advance stop bar before crosswalk (Bicycle Box)	S20PB	10	0.85	100%	0	0	1	0	0.00	\$ -	\$ 42,690	100 SQFT	\$6	\$600	71.2
								0	0.00	0.30	0.00	\$ 42,690						
								1	0.00	0.00	0.00	\$ -						

General Plan

Proposed Roadway Network

Roadway Type: collector

Not a transit priority corridor

Truck Route

Land Use Changes

Range of residential densities: medium-high density toward the downtown core, low density near the park.



Hickey Blvd

El Camino Real to City Limits

Existing Conditions

Bike Facilities

- No existing facilities

Roadway

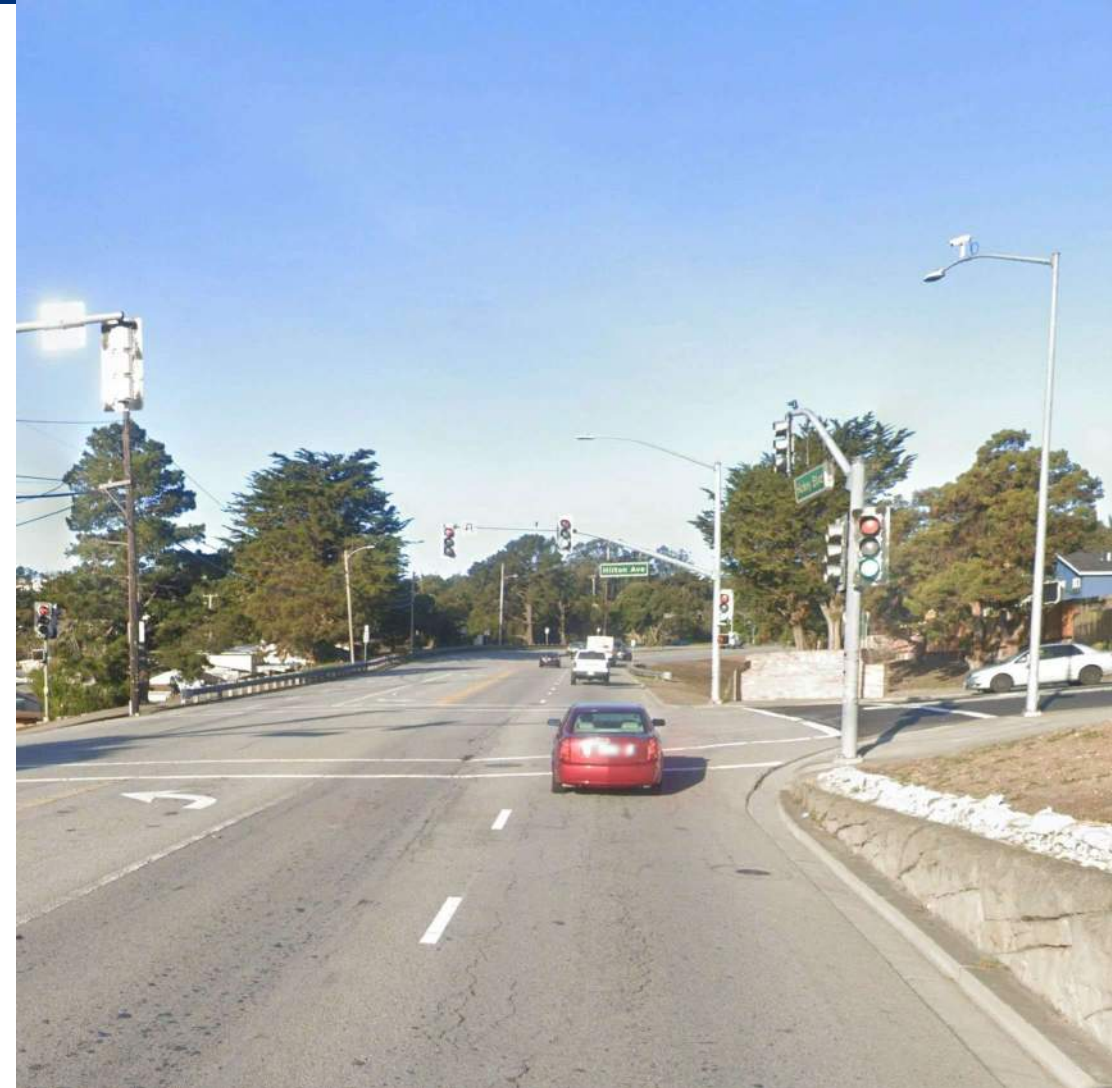
- 4 vehicle lanes with raised median or CLTL
- No on-street parking

Transit

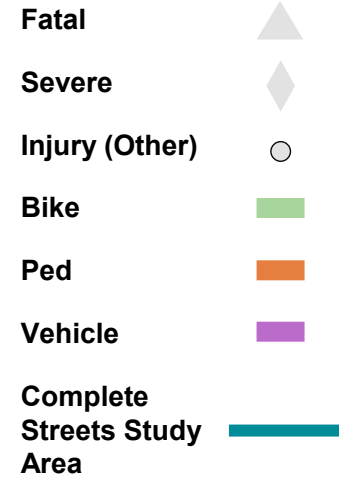
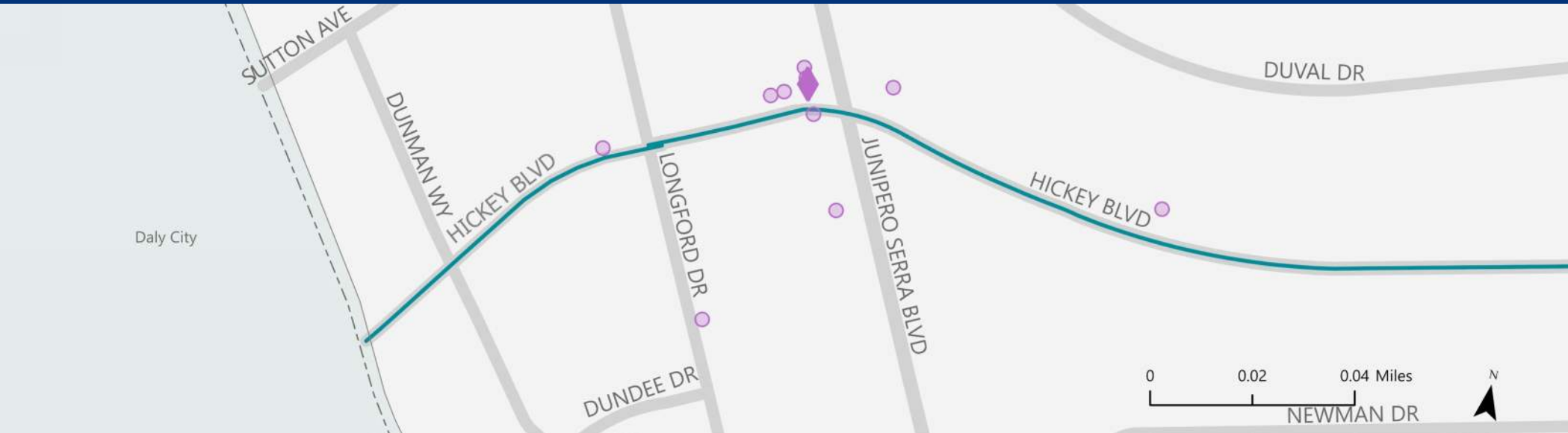
- SamTrans Route 130 (15-minute headways)

Land Use

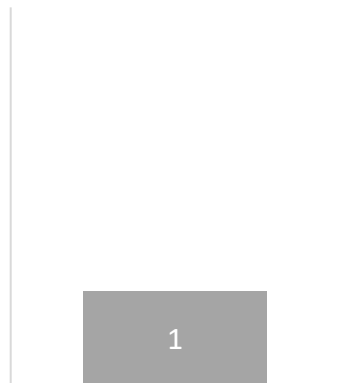
- Few driveways to access surrounding land uses
- Low to high density residential and commercial



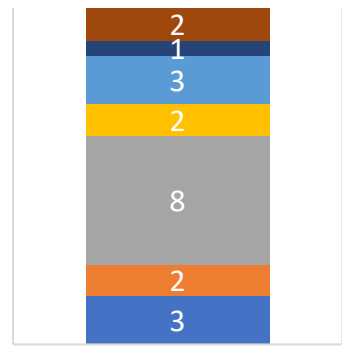
Collision Analysis



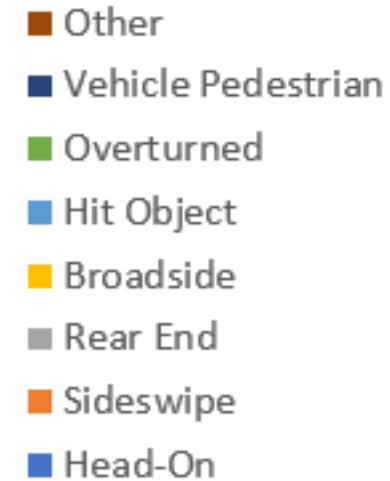
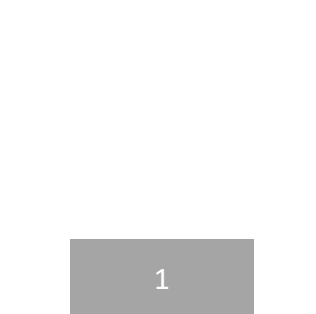
LONGFORD DR/HICKEY BLVD



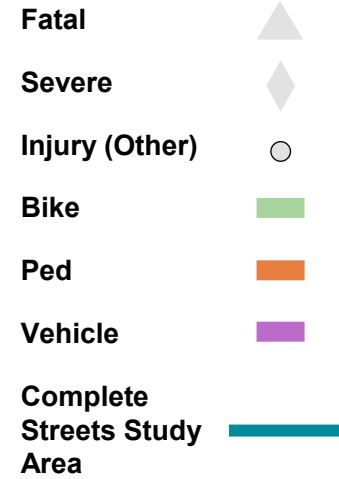
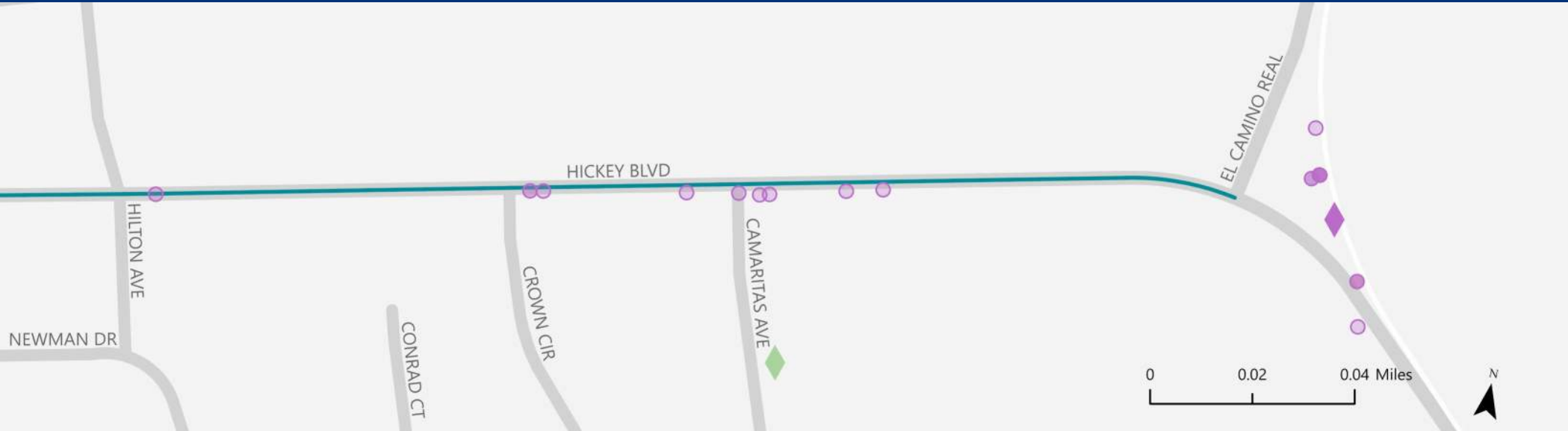
HICKEY BLVD/JUNIPERO SERRA BLVD



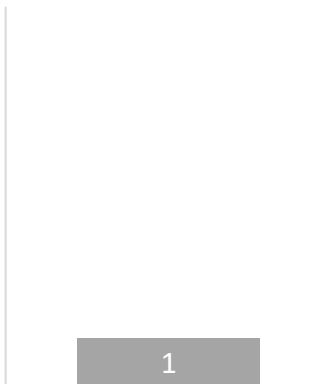
HICKEY BLVD BETWEEN JUNIPERO SERRA BLVD AND HILTON AVE



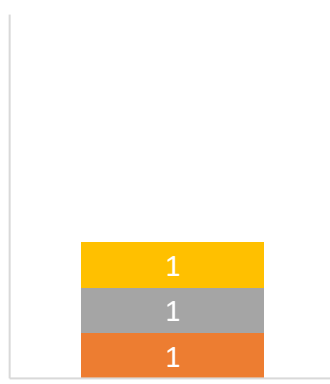
Collision Analysis



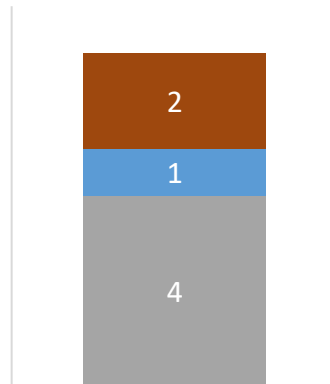
HILTON AVE/HICKEY BLVD



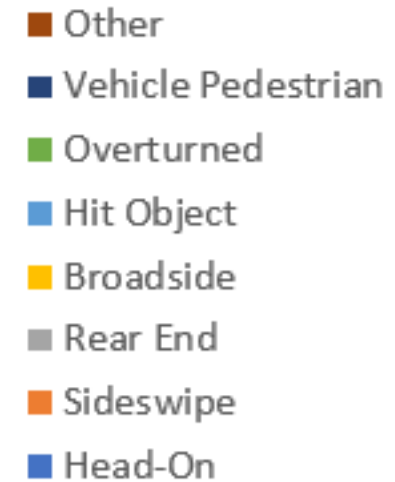
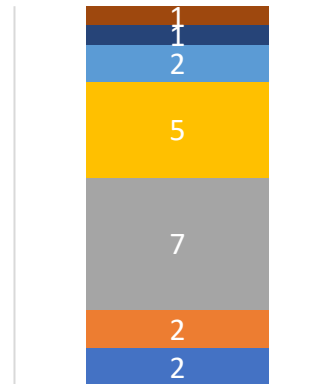
HICKEY BLVD/CROWN CIR



HICKEY BLVD/CAMARITAS AVE



EL CAMINO REAL/HICKEY BLVD



Active South City Plan (2022)

Bike Facilities:

Level of Traffic Stress
3

Recommend Class IV
Protected Bike Lanes

Intersection Spot Treatments:

Hilton

Consider improvements such as curb extensions, signage & lighting, crosswalks & curb ramps, pedestrian crossing beacons, conflict markings & advance stop/yield markings, bicycle detection, and/or traffic circles

El Camino Real

Upgrade all crosswalks to high-visibility crosswalks. Straighten the northern ECR crosswalk. Install a high-visibility crosswalk across the southern ECR approach (push back the northbound stop bar and median to create a straight crossing). Provide a leading pedestrian interval for the ECR crossings.

Junipero Serra

Remove the free right turn lane at the southeast, southwest, and northwest corner. Upgrade all crosswalks to high visibility crosswalks. Provide leading pedestrian intervals for both crosswalks. Construct pedestrian refuge islands.

General Plan and Speeds

Proposed Roadway Network

Roadway Type: arterial

Transit priority corridor

Truck Route

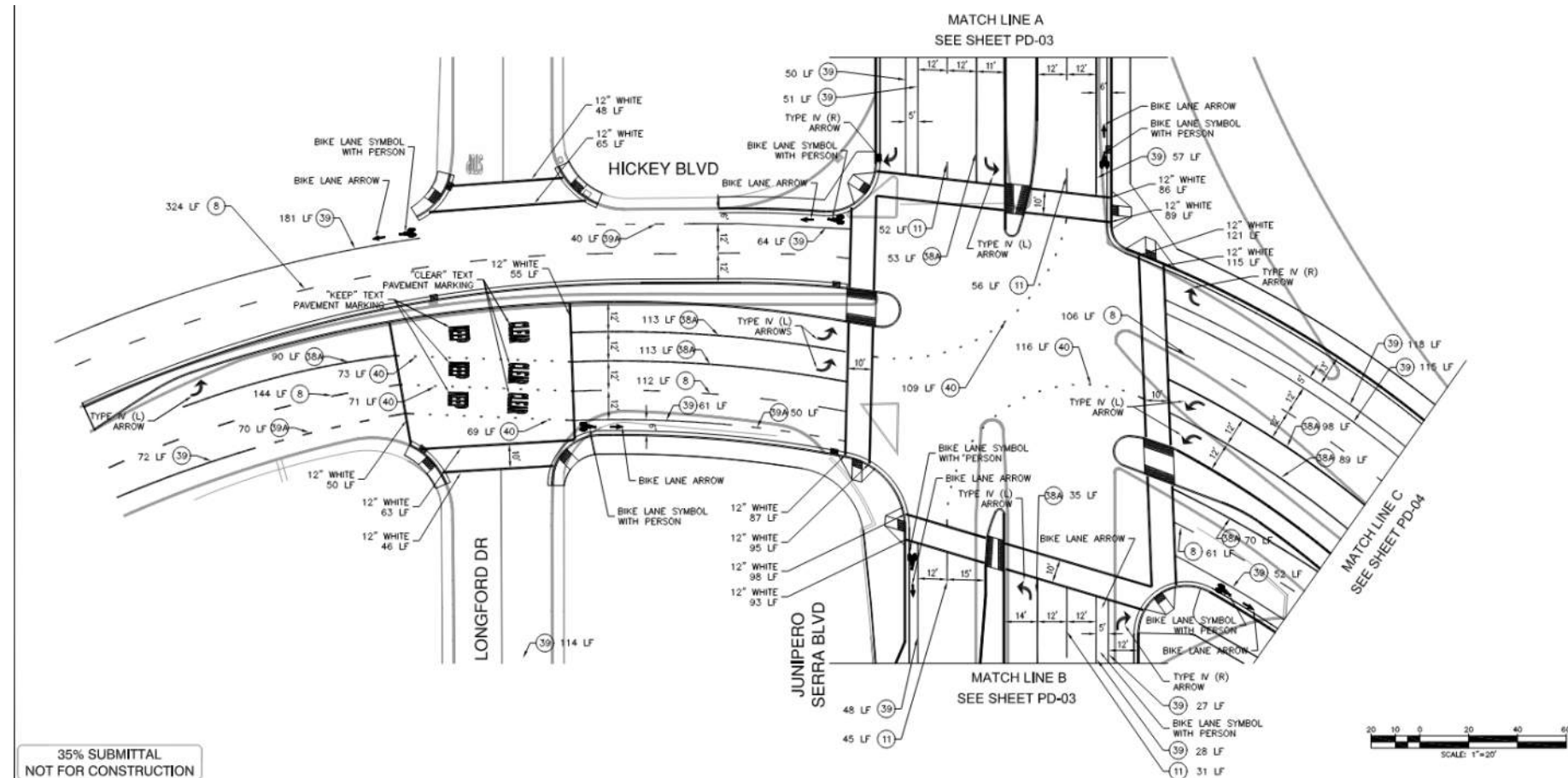
Land Use Changes

Low density residential and
low density mixed-use

Hickey Blvd & ECR

Proposed Changes

- Add additional eastbound and westbound Left turn lanes
- Remove all slip lanes
- Class II Bike Lanes along Hickey





Hillside Blvd/ Sister Cities Blvd & Randolph Ave

Chestnut Ave to Airport Blvd 

Existing Conditions

Bike Facilities

- Existing Class II and Class III Facilities

Roadway

- 4 vehicle lanes with raised median or
- No on-street parking
- Frontage road running along south side

Transit

- Commute.Org Shuttles

Land Use

- No driveways to access surrounding land uses
- Low density residential



Hillside Boulevard & Sister Cities Boulevard

Vehicle Speeds

Bus Speeds (CAL ITP)

N/A

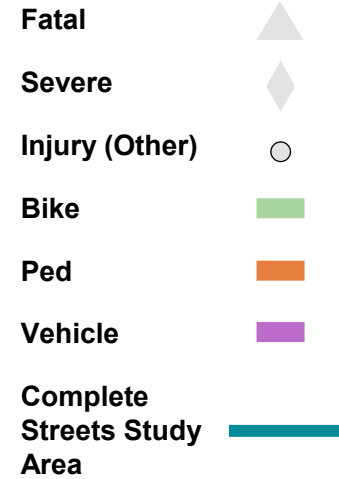
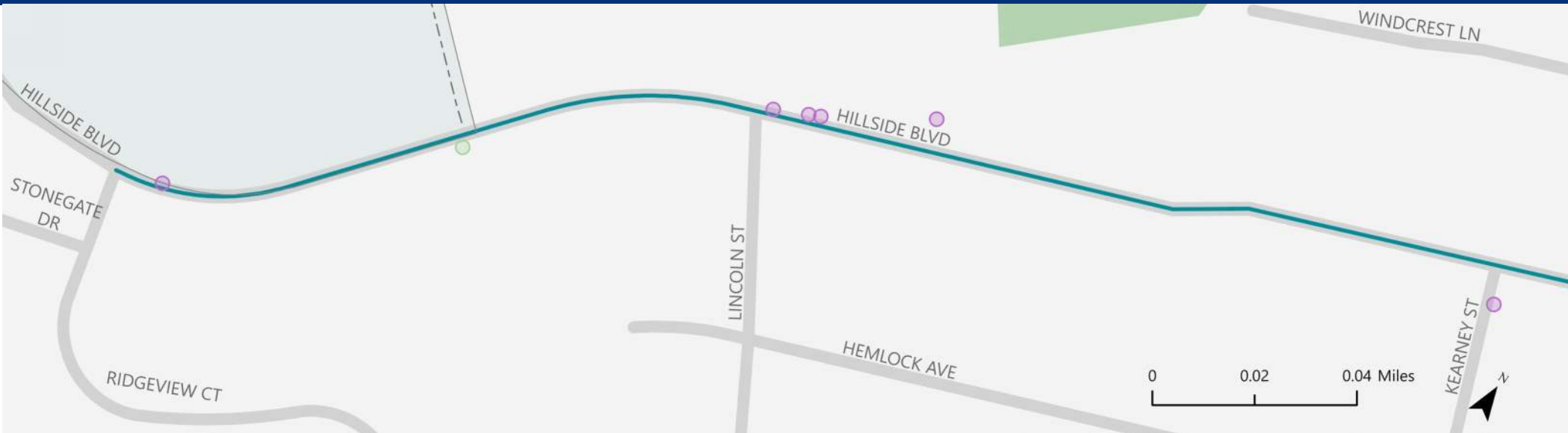
Speed Surveys:

Posted: 40 mph

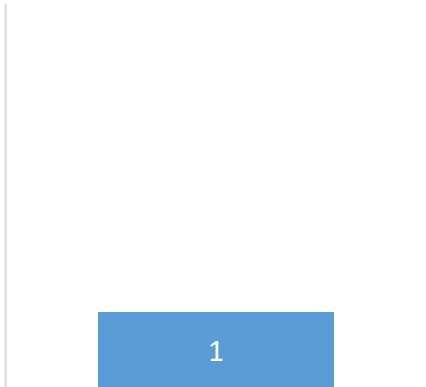
85th Percentile: 46-49 mph



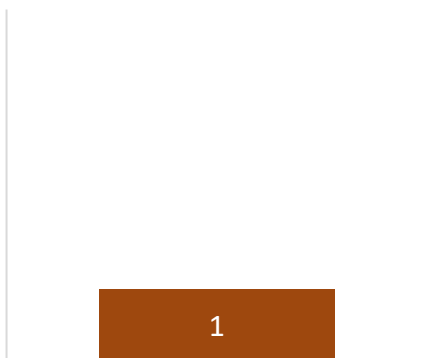
Collision Analysis



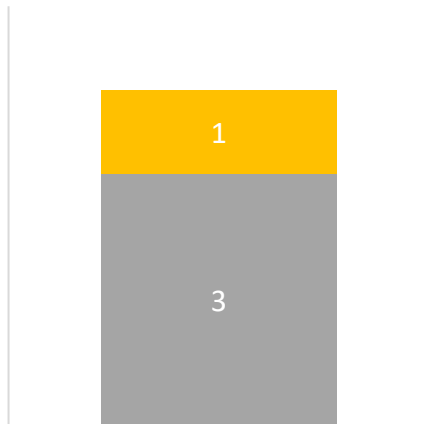
HILLSIDE BLVD/RIDGEVIEW CT



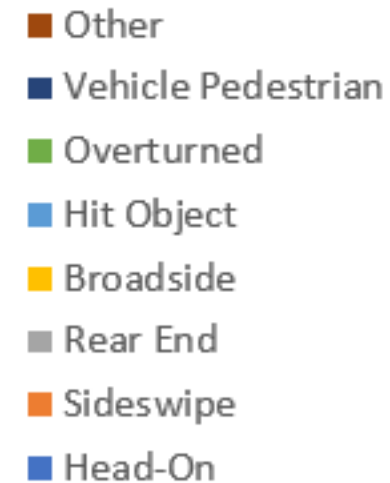
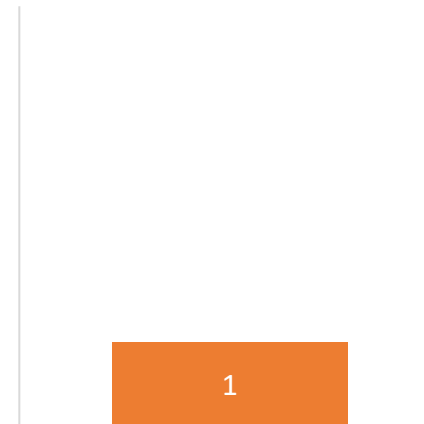
HILLSIDE BLVD BETWEEN LINCOLN ST AND RIDGEVIEW CT



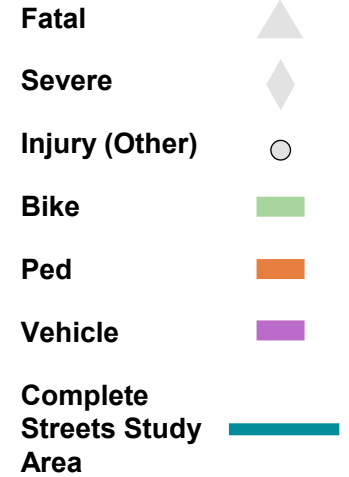
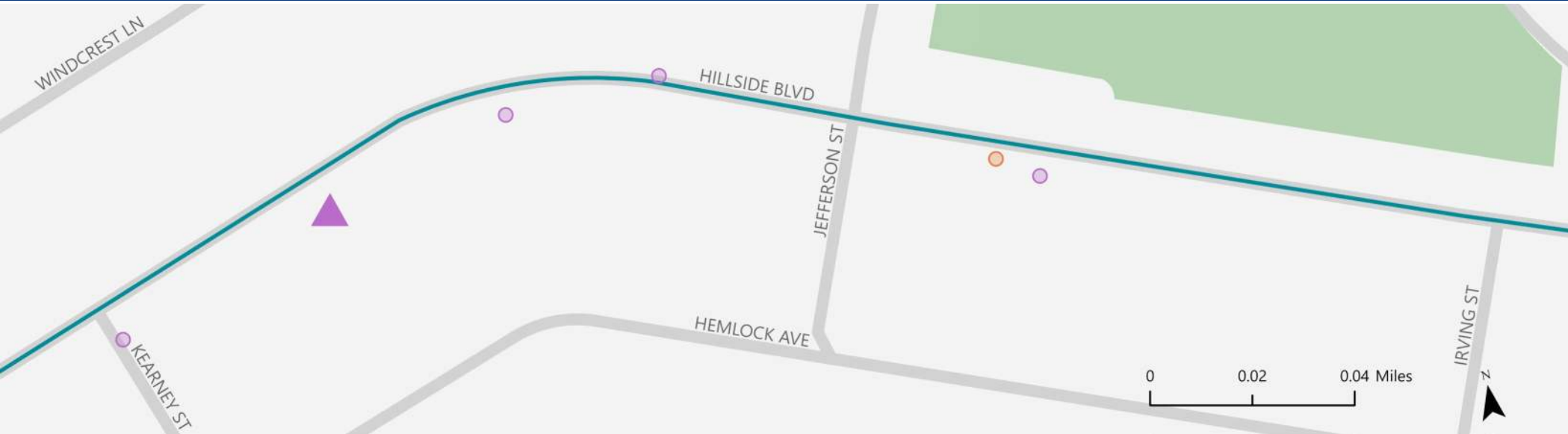
HILLSIDE BLVD/LINCOLN ST



HILLSIDE BLVD/KEARNEY ST



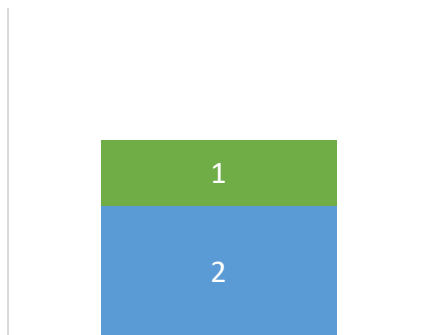
Collision Analysis



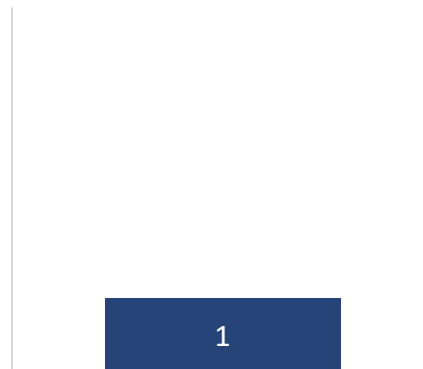
HILLSIDE BLVD/KEARNEY ST



HILLSIDE BLVD BETWEEN JEFFERSON ST AND KEARNEY ST



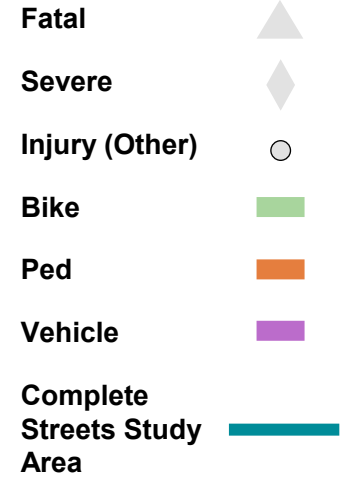
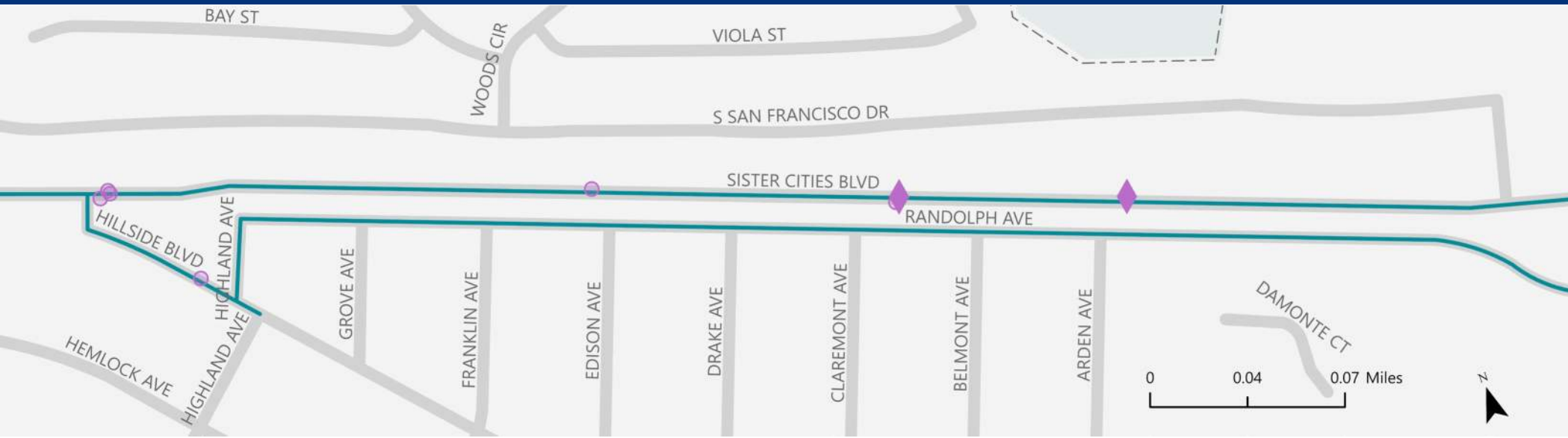
HILLSIDE BLVD/JEFFERSON ST



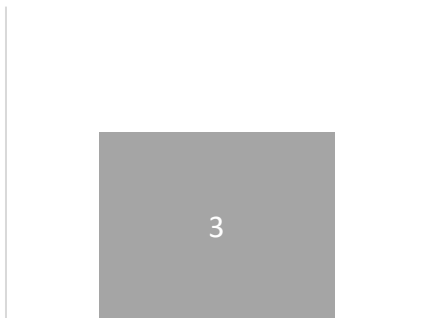
HILLSDALE BLVD BETWEEN JEFFERSON ST AND IRVING ST



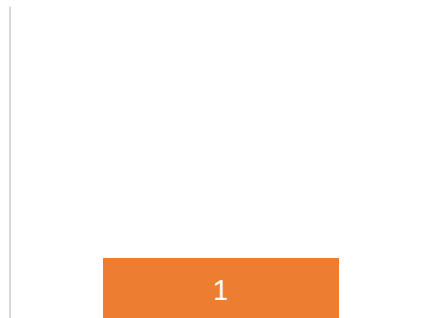
Collision Analysis



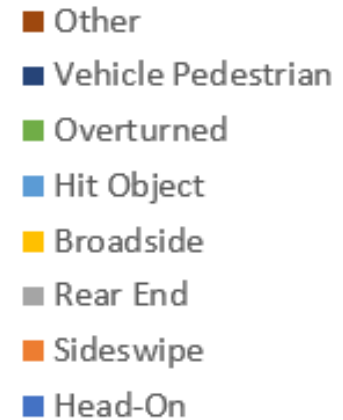
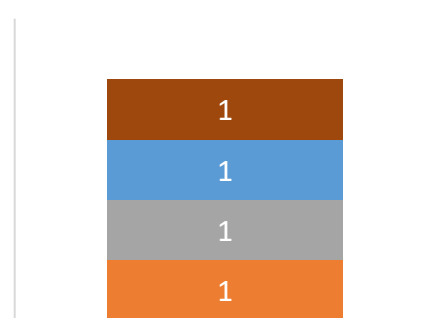
HILLSIDE BLVD/SISTER CITIES BLVD



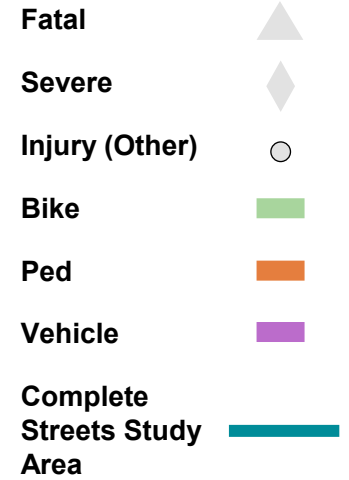
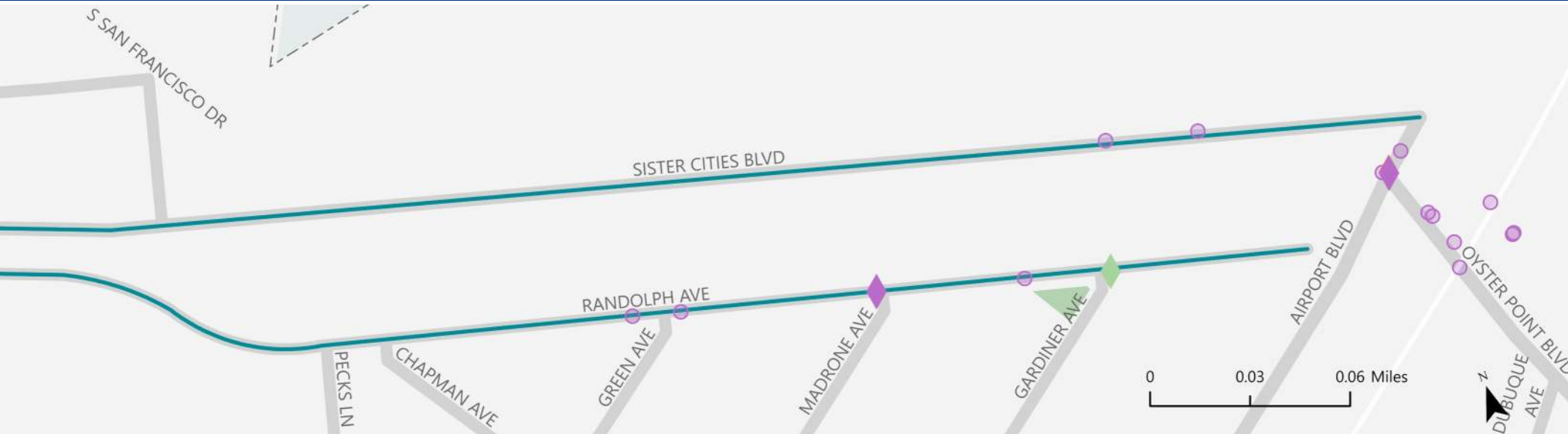
HILLSIDE BLVD/HIGHLAND AVE



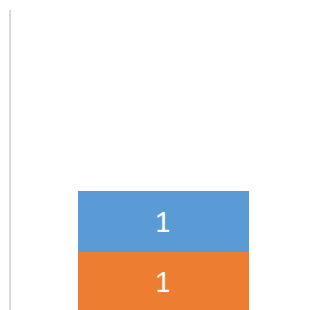
SISTER CITIES BLVD BETWEEN SOUTH SAN FRANCISCO DR AND HILLSIDE BLVD



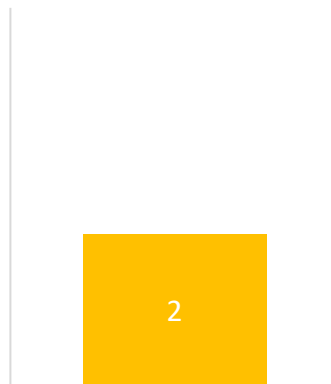
Collision Analysis



SISTER CITIES BLVD BETWEEN AIRPORT BLVD AND SOUTH SAN FRANCISCO DR



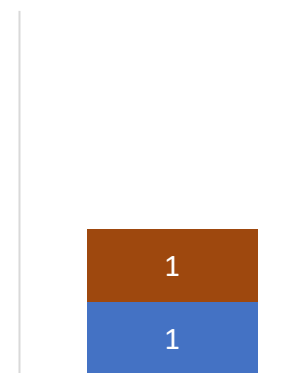
GREEN AVE/RANDOLPH AVE



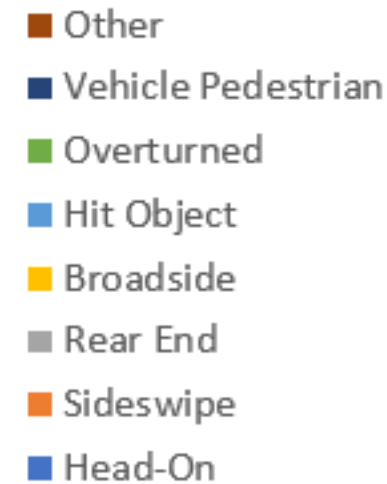
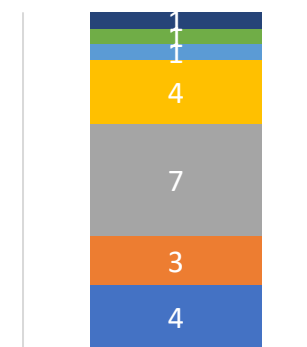
RANDOLPH AVE/MADRONE AVE



RANDOLPH AVE/GARDINER AVE



AIRPORT BLVD/SISTER CITIES BLVD



Active South City Plan (2022)

Bike Facilities:

Level of Traffic Stress 4

Recommend Class IIB buffered bike lanes along Hillside Blvd and Class IV protected bike lanes along Sister Cities

Intersection Spot Treatments:

Chestnut

Consider improvements such as curb extensions, no right turn on red, crosswalks & curb ramps, slip lane removal, leading pedestrian intervals, conflict markings, bicycle detection, signage & lighting, and/or traffic circles

Spruce

Construct curb extensions at the two northern and southeastern corners.

General Plan

Proposed Roadway Network

Roadway Type: arterial

Transit priority corridor

Truck Route

Land Use Changes

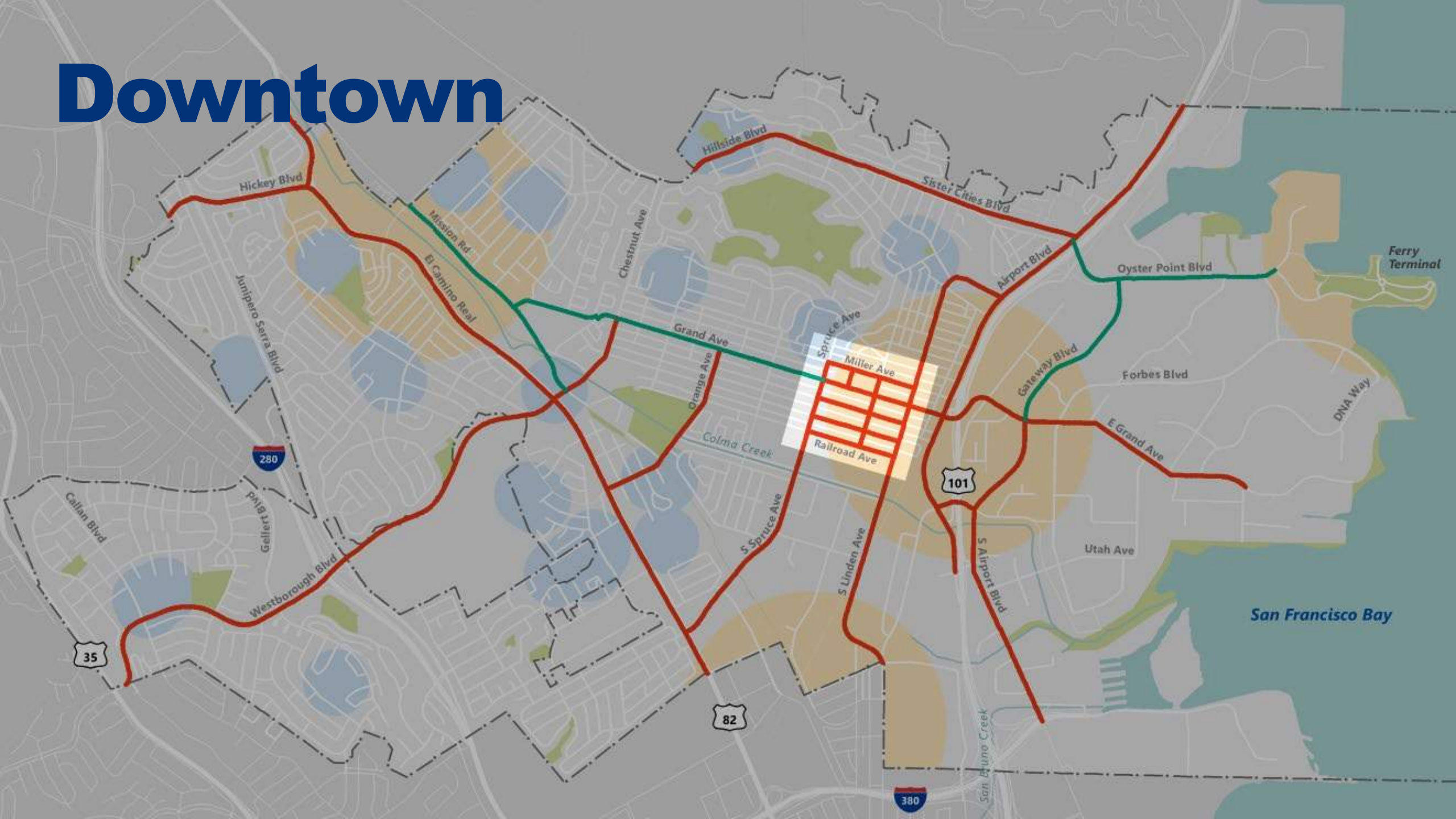
Low density residential

Hold for sidewalk connection

Data from City

- TBD

Downtown



Hickey Blvd

Hillside Blvd

Sister Cities Blvd

Junipero Serra Blvd

Mission Rd
El Camino Real

Chestnut Ave

Airport Blvd

Oyster Point Blvd

Ferry Terminal

Grand Ave

Spruce Ave

Miller Ave

Gateway Blvd

Forbes Blvd

DNA Way

Orange Ave

Colma Creek

Railroad Ave

101

E Grand Ave

Callan Blvd

1918 Leland St

Westborough Blvd

35

S Spruce Ave

S Linden Ave

S Airport Blvd

Utah Ave

San Francisco Bay

82

380

San Bruno Creek

Existing Conditions

Bike Facilities

- Existing Class III Facilities on Miller Ave/Baden Ave (east-west) and Spruce Ave/Linden Ave (north-south)

Roadway

- Network of two-lane streets and small alleyways
- On-street parking throughout, front-in angled parking along Grand Avenue

Transit

- Route 130 and Route 141
- SSF Shuttle Routes

Land Use

- Downtown core commercial



Vehicle Speeds

Bus Speeds (CAL ITP)

SamTrans Route 130, 141

Speeds between 3 – 12 mph

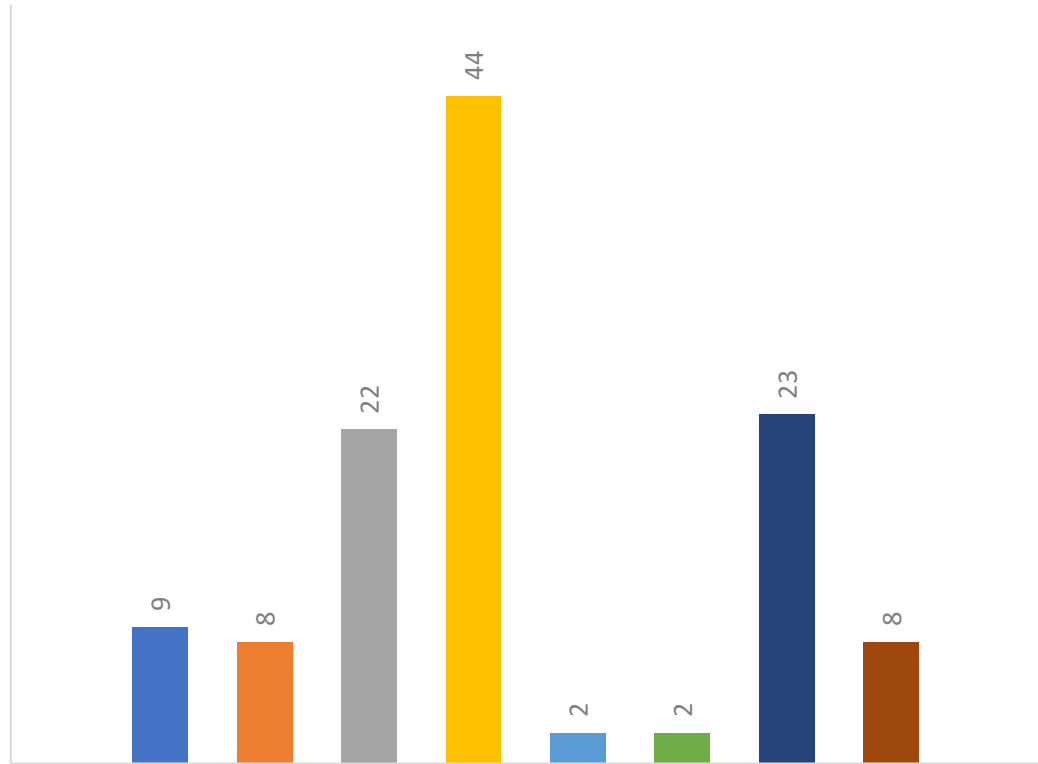
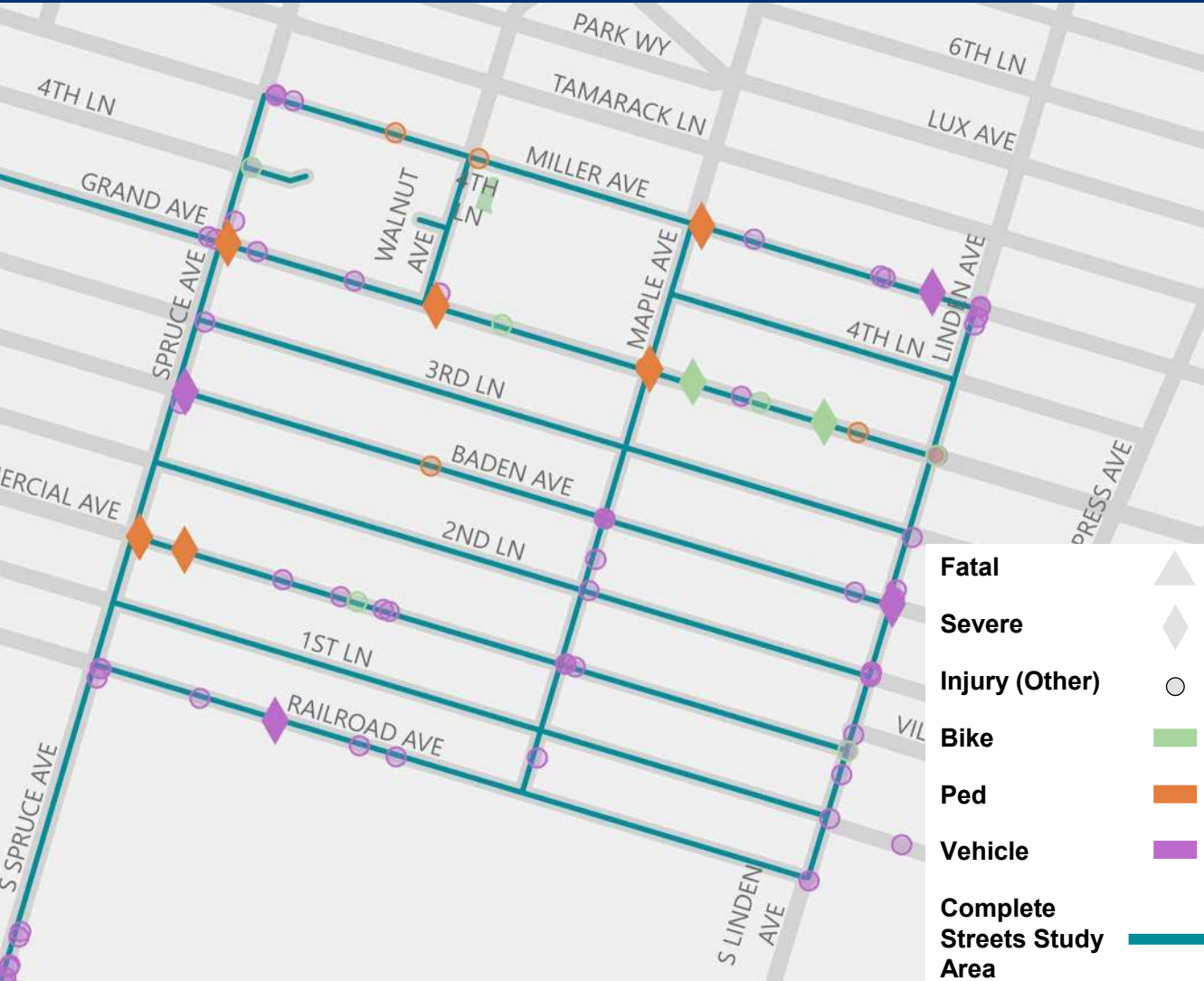
Speed Surveys:

Posted: 40 mph

85th Percentile: 46-49 mph



Collision Analysis



- Head-On
- Sideswipe
- Rear End
- Broadside
- Hit Object
- Overturned
- Vehicle Pedestrian
- Other

Active South City Plan (2022)

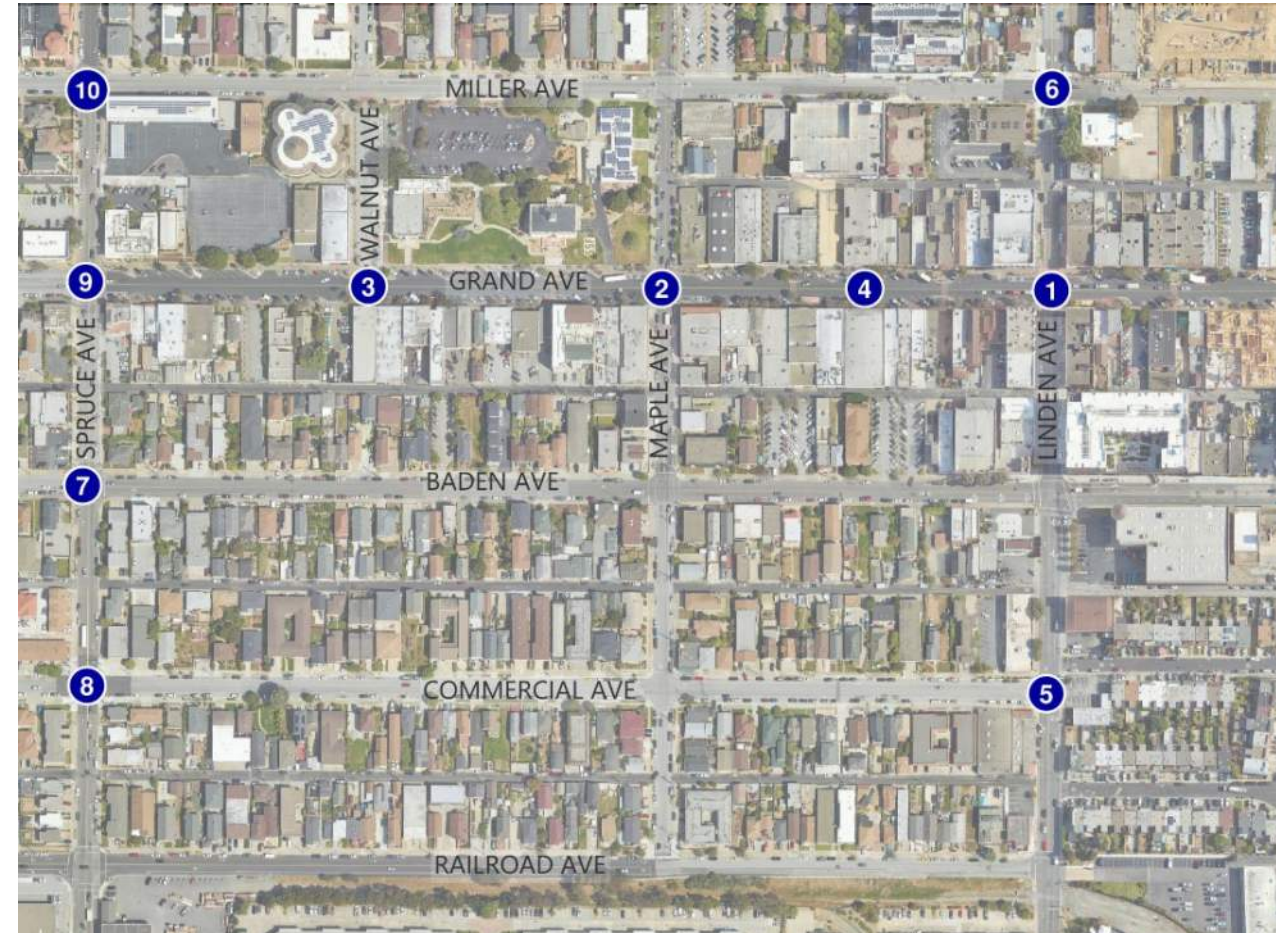
Intersection Spot Treatments:

1. Grand and Linden

Install advance stop markings at all approaches. Provide a leading pedestrian intervals for all crossings.

2. Grand and Maple

Install advance stop markings at all approaches. Provide a leading pedestrian intervals for all crossings.



Active South City Plan (2022)

Intersection Spot Treatments:

3. Grand and Walnut

Install advance yield pavement markings and signs.

4. Grand between Linden and Maple

Install advance yield pavement markings and signs.

5. Linden and Commercial

Consider improvements such as curb extensions, signage & lighting, crosswalks & curb ramps, pedestrian crossing beacons, conflict markings & advance stop/yield markings, and red curb



Active South City Plan (2022)

Intersection Spot Treatments:

6. Linden and Miller

Consider improvements such as curb extensions, signage & lighting, crosswalks & curb ramps, pedestrian crossing beacons, conflict markings & advance stop/yield markings, and red curb

7. Spruce and Baden

Consider improvements such as curb extensions, no right turn on red, crosswalks & curb ramps, slip lane removal, leading pedestrian intervals, conflict markings, bicycle detection, signage & lighting, and/or traffic circles



Active South City Plan (2022)

Intersection Spot Treatments:

8. Spruce and Commercial

Consider improvements such as curb extensions, signage & lighting, crosswalks & curb ramps, pedestrian crossing beacons, conflict markings & advance stop/yield markings, and red curb

9. Spruce and Grand

Consider improvements such as curb extensions, signage & lighting, crosswalks & curb ramps, pedestrian crossing beacons, conflict markings & advance stop/yield markings, and red curb



Active South City Plan (2022)

Intersection Spot Treatments:

10. Linden and Miller

Install yellow transverse markings around the decorative crosswalk. Upgrade three remaining crosswalks to high-visibility. Consider installing curb extensions at all corners.



Local Roadway Safety Plan (2022)

Project Recommendation for Linden & Grand Intersection

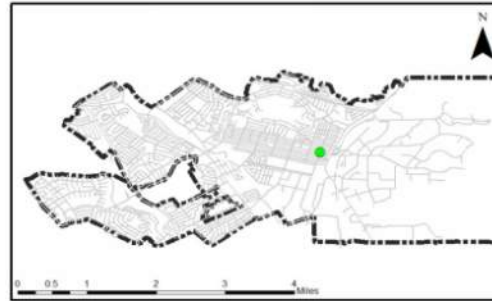
Signal phasing changes to improve safety for pedestrians

Signal upgrades to include mast arms, reflective backplates, and enhanced intersection lighting

Striping changes to include advanced stop bars and high visibility crossings

South San Francisco Local Road Safety Plan
Project Description for Intersection Improvements

Location: Linden Avenue & Grand Avenue
Agency Name: City of South San Francisco
Contact Name: Chou, Jeffrey
E-mail: Jeffrey.Chou@ssf.net



Signalized Intersection



Total Crashes	37
Local CCR Differential	0.70
Equivalent Property Damage Only	317
Fatal	0
Major Injury	1
Minor Injury	12
PDO	24
Crash Type	
Broadside	4
Sideswipe	10
Rear End	4
Head On	1
Hit Object	2
Overturned	0
Non-Motorist Crashes	
Pedestrian	7
Bicycle	1
Contributing Factors	
Aggressive	4
Impaired	4
Crash Conditions	
Dark	5
Wet	5

NOTES	COLLISION TYPE	RECOMMENDATION	LRSM/CMF COUNTERMEASURE	LRSM #	Expected Life (Years)	CMF	CALTRANS FUNDING	NUMBER OF CRASHES (2015-2019)	NUMBER OF HISTORIC CRASHES REDUCED	10-YEAR CRASH REDUCTION ESTIMATE	10-YEAR CRASH REDUCTION BENEFIT (2016 \$)	TOTAL 10-YEAR CRASH REDUCTION BENEFIT (2016 \$)	QUANTITY/ NUMBER OF UNITS	UNIT COST	HSIP COST ESTIMATE	BENEFIT/COST
-	All	Add/extend all-red time	Improve signal timing (coordination, phases, red, yellow, or operation)	S03	10	0.85	50%	Fatal 0 Major Injury 1 Minor Injury 12 PDO 24	0.00 1.00 12.00 24.00	0.00 2.00 24.00 48.00	\$ - \$ 3,180,000 \$ 3,415,224 \$ 638,400	\$ 7,233,624	1 Intersection	\$5,000	\$5,000	1,446.7
-	Pedestrian and Bicycle	Implement LPI	Modify signal phasing to implement a Leading Pedestrian Interval (LPI)	S21PB	10	0.4	100%	Fatal 0 Major Injury 1 Minor Injury 7 PDO 0	0.00 0.60 4.20 0.00	0.00 1.20 8.40 0.00	\$ - \$ 1,908,000 \$ 1,195,328 \$ -	\$ 3,103,328	1 Intersection	\$5,000	\$5,000	620.7
-	Pedestrian and Bicycle	Advanced Stop Bars to encourage drivers to stop further back from crosswalks for added safety of crossing pedestrians	Install advance stop bar before crosswalk (Bicycle Box)	S20PB	10	0.85	100%	Fatal 0 Major Injury 1 Minor Injury 7 PDO 0	0.00 0.15 1.05 0.00	0.00 0.30 2.10 0.00	\$ - \$ 477,000 \$ 298,832 \$ -	\$ 775,832	92 Linear Feet	\$6	\$552	1,405.5
-	All	Replace traffic signal pedestals with mast arms	Add intersection lighting	S08	20	0.7	100.00%	Fatal 0 Major Injury 1 Minor Injury 12 PDO 24	0.00 0.30 3.60 7.20	0.00 0.60 7.20 14.40	\$ - \$ 954,000 \$ 1,024,567 \$ 191,520	\$ 2,170,087	4 New Mast Arms	\$10,000	\$40,000	54.3
-	All	Install Retroreflective Backplates	Improve signal hardware: lenses, back-plates with retroreflective borders, mounting, size, and number	S02	10	0.85	100%	Fatal 0 Major Injury 1 Minor Injury 12 PDO 24	0.00 0.15 1.80 3.60	0.00 0.30 3.60 7.20	\$ - \$ 477,000 \$ 512,284 \$ 95,760	\$ 1,085,044	8 Retroreflective Backplates	\$750	\$6,000	180.8
-	Nighttime	Enhance intersection lighting	Add intersection lighting	S01	20	0.6	100%	Fatal 0 Major Injury 0 Minor Injury 3 PDO 2	0.00 0.00 1.20 0.80	0.00 0.00 2.40 1.60	\$ - \$ - \$ 341,522 \$ 21,280	\$ 362,802	4 Luminaires	\$10,000	\$40,000	9.1

Local Roadway Safety Plan (2022)

Project Recommendation for Spruce & Grand Intersection

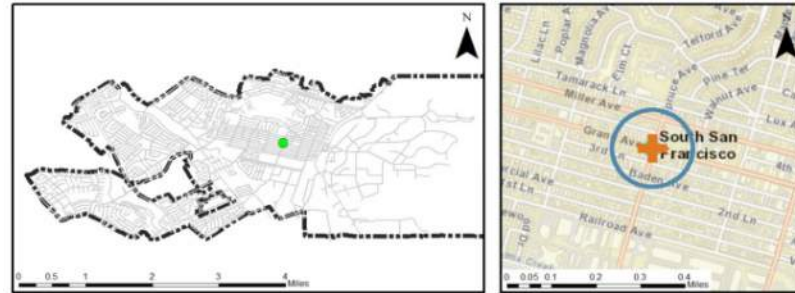
Signal phasing changes to improve safety for pedestrians

Signal upgrades to include mast arms, reflective backplates, and enhanced intersection lighting

Striping changes to include advanced stop bars and high visibility crossings

South San Francisco Local Road Safety Plan
Project Description for Intersection Improvements

Location: Grand Avenue & Spruce Avenue
Agency Name: City of South San Francisco
Contact Name: Chou, Jeffrey
E-mail: Jeffrey.Chou@ssf.net



Signalized Intersection



Total Crashes	34
Local CCR Differential	0.88
Equivalent Property Damage Only	526
Fatal	0
Major Injury	2
Minor Injury	17
PDO	15
Crash Type	
Broadside	6
Sideswipe	3
Rear End	8
Head On	1
Hit Object	1
Overturned	0
Non-Motorist Crashes	
Pedestrian	5
Bicycle	2
Contributing Factors	
Aggressive	7
Impaired	0
Crash Conditions	
Dark	2
Wet	1

NOTES	COLLISION TYPE	RECOMMENDATION	LRSM/CMF COUNTERMEASURE	LRSM #	Expected Life (Years)	CMF	CALTRANS FUNDING	NUMBER OF CRASHES (2015-2019)	NUMBER OF HISTORIC CRASHES REDUCED	10-YEAR CRASH REDUCTION ESTIMATE	10-YEAR CRASH REDUCTION BENEFIT (2016 \$)	TOTAL 10-YEAR CRASH REDUCTION BENEFIT (2016 \$)	QUANTITY/ NUMBER OF UNITS	UNIT COST	HSIP COST ESTIMATE	BENEFIT/COST	
-	All	Add/extend all-red time	Improve signal timing (coordination, phases, red, yellow, or operation)	S03	10	0.85	50%	Fatal	0	0.00	0.00	\$ -	\$ 11,597,234	1 Intersection	\$5,000	\$5,000	2,319.4
								Major Injury	2	2.00	4.00	\$ 6,360,000					
								Minor Injury	17	17.00	34.00	\$ 4,838,234					
								PDO	15	15.00	30.00	\$ 399,000					
-	Pedestrian and Bicycle	Implement LPI	Modify signal phasing to implement a Leading Pedestrian Interval (LPI)	S21PB	10	0.4	100%	Fatal	0	0.00	0.00	\$ -	\$ 2,436,244	1 Intersection	\$5,000	\$5,000	487.2
								Major Injury	1	0.60	1.20	\$ 1,908,000					
								Minor Injury	3	1.80	3.60	\$ 512,284					
								PDO	1	0.60	1.20	\$ 15,960					
-	Pedestrian and Bicycle	Install advanced stop bar	Install advance stop bar before crosswalk (Bicycle Box)	S20PB	10	0.85	100%	Fatal	0	0.00	0.00	\$ -	\$ 609,061	92 SQFT	\$6	\$552	1,103.4
								Major Injury	1	0.15	0.30	\$ 477,000					
								Minor Injury	3	0.45	0.90	\$ 128,071					
								PDO	1	0.15	0.30	\$ 3,990					
-	All	Replace traffic signal pedestals with mast arms	Convert signal to mast arm (from pedestal-mounted)	S08	20	0.7	100.00%	Fatal	0	0.00	0.00	\$ -	\$ 3,479,170	4 New Mast Arms	\$10,000	\$40,000	87.0
								Major Injury	2	0.60	1.20	\$ 1,908,000					
								Minor Injury	17	5.10	10.20	\$ 1,451,470					
								PDO	15	4.50	9.00	\$ 119,700					
-	All	Install Retroreflective Backplates	Improve signal hardware: lenses, back-plates with retroreflective borders, mounting, size, and number	S02	10	0.85	100%	Fatal	0	0.00	0.00	\$ -	\$ 1,739,585	8 Retroreflective Backplates	\$750	\$6,000	289.9
								Major Injury	2	0.30	0.60	\$ 954,000					
								Minor Injury	17	2.55	5.10	\$ 725,735					
								PDO	15	2.25	4.50	\$ 59,850					
-	Nighttime	Enhance intersection lighting	Add intersection lighting	S01	20	0.6	100%	Fatal	0	0.00	0.00	\$ -	\$ 227,682	4 Luminaires	\$10,000	\$40,000	5.7
								Major Injury	0	0.00	0.00	\$ -					
								Minor Injury	2	0.80	1.60	\$ 227,682					
								PDO	0	0.00	0.00	\$ -					
-	Pedestrian and Bicycle	High Visibility Crosswalks	Install pedestrian crossing (S.I.)	S18PB	20	0.75	100%	Fatal	0	0.00	0.00	\$ -	\$ 1,624,162	1750 SQFT	\$6	\$10,500	154.7
								Major Injury	1	0.40	0.80	\$ 1,272,000					
								Minor Injury	3	1.20	2.40	\$ 341,522					
								PDO	1	0.40	0.80	\$ 10,640					

Appendix B: Chestnut Ave & Airport Blvd Concepts

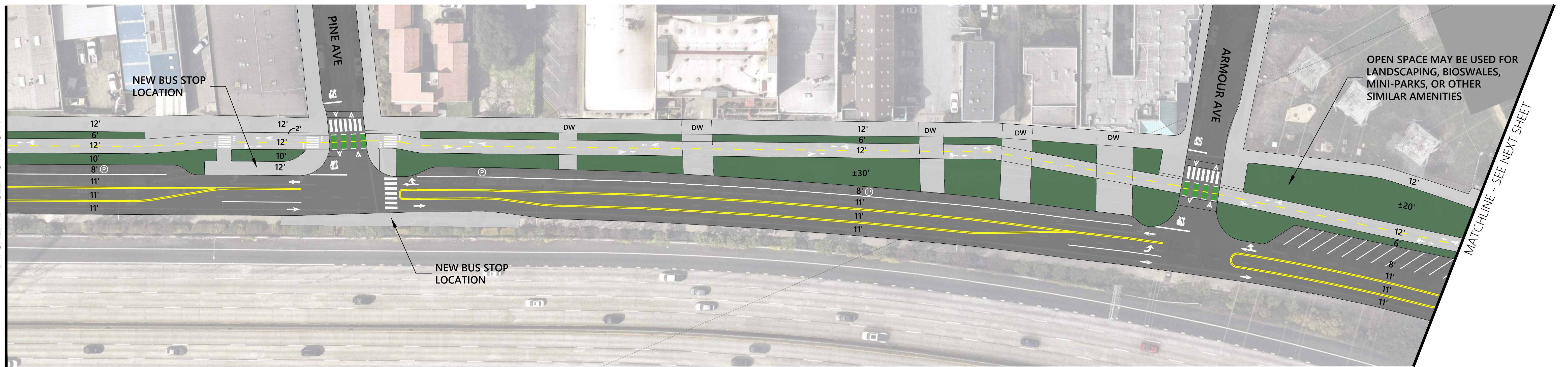
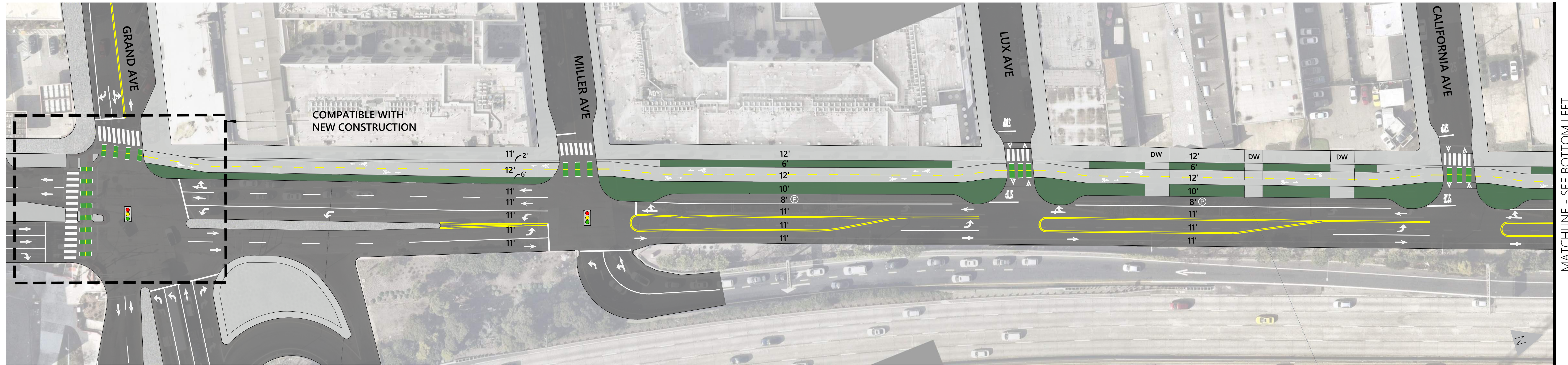


Figure 1

South San Francisco West of 101 Complete Streets
 Airport Boulevard
 Grand Avenue to Armour Avenue



CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

CADD FILE: c:\p\pbox\Box\Projects\SF\Projects\SF-2023-1339-03_Chestnut and Airport Complete Streets\CAD\Concepts\1339-03-Airport.dwg
Dec 11, 2024

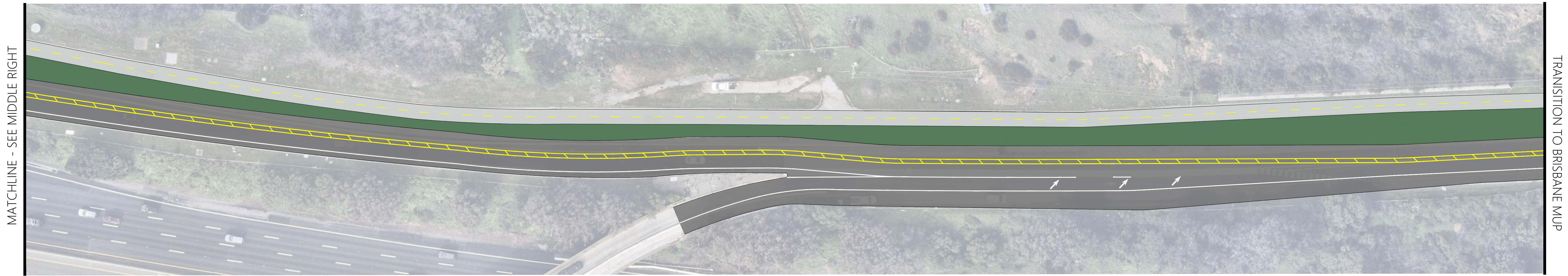
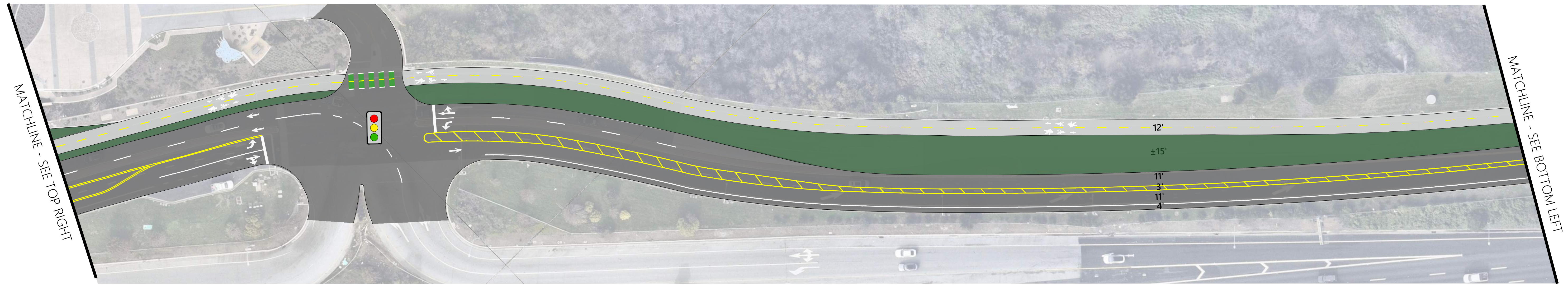
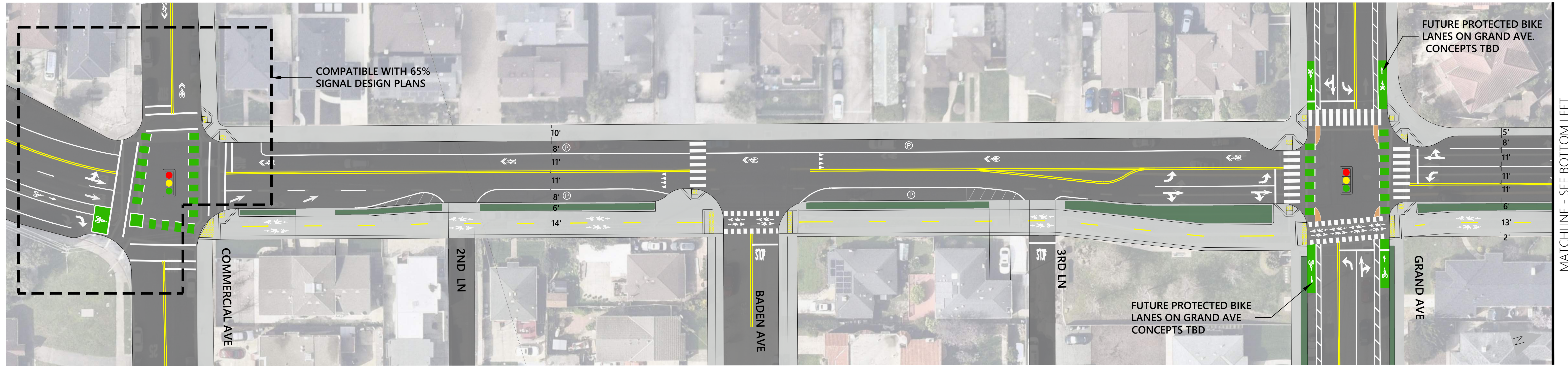


Figure 3

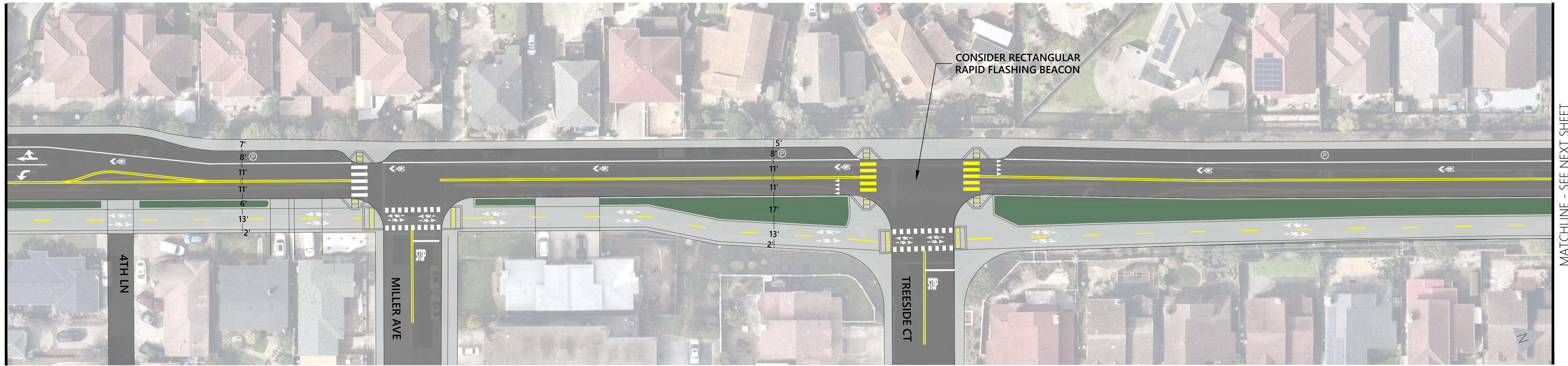
South San Francisco West of 101 Complete Streets
Airport Boulevard/Bayshore Boulevard
Tower Place to City Limits



CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL
DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.



MATCHLINE - SEE BOTTOM LEFT



MATCHLINE - SEE TOP RIGHT

MATCHLINE - SEE NEXT SHEET

Figure 1

South San Francisco West of 101 Complete Streets
 Chestnut Avenue
 Commercial Avenue to Tresside Court



CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.

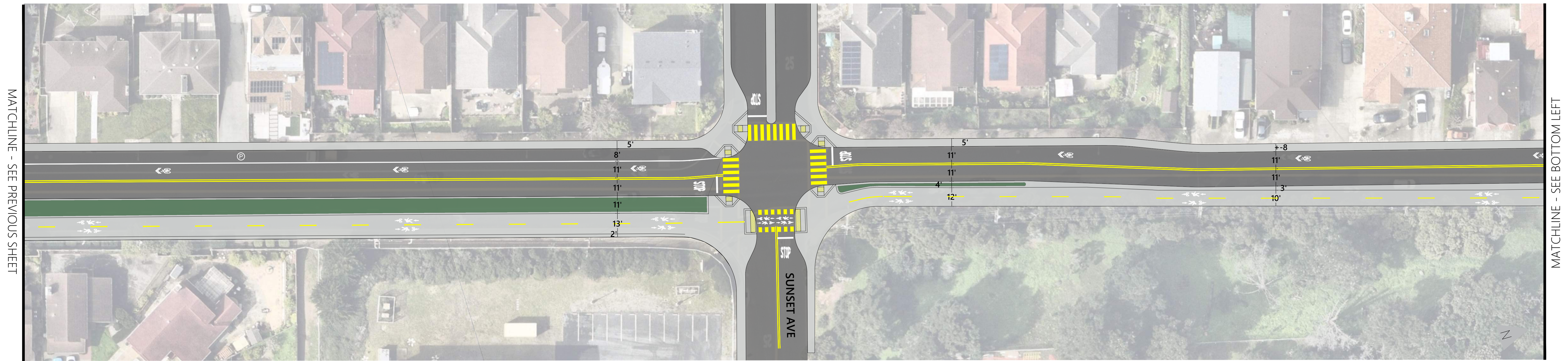


Figure 2
 South San Francisco West of 101 Complete Streets
 Chestnut Avenue
 Treeside Court to Hillside Boulevard



CONCEPTUAL - NOT FOR CONSTRUCTION. ADDITIONAL DETAILED ANALYSIS AND ENGINEERING DESIGN REQUIRED.