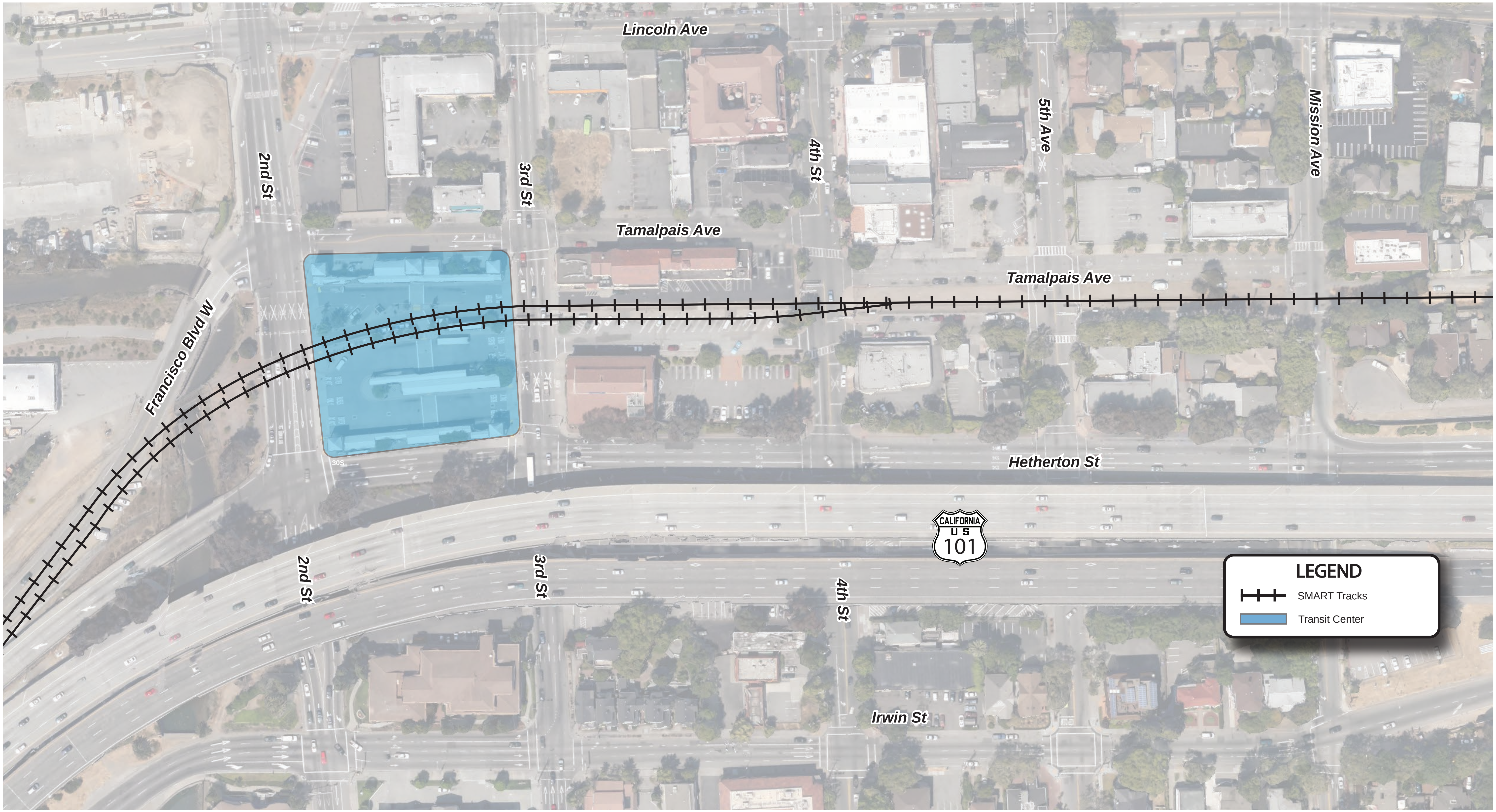
SAN RAFAEL TRANSPORTATION CENTER

Relocation Analysis, Environmental Clearance, and Preliminary Design



Kimley»Horn

Figure 1-2: No Build Alternative

4th Street Gateway Alternative

The 4th Street Gateway Alternative is shown in Figure 1-3. This alternative utilizes the two blocks bound by the SMART tracks, 3rd Street, Hetherton Street, and Fifth Avenue.

This alternative would include three curbside bays on the west side of Hetherton Street between 4th Street and Fifth Avenue. To accommodate these curbside bays, southbound right-turns from Hetherton Street to 4th Street would be precluded. Other bus bays would be accessed via driveways on 3rd and 4th Streets and a driveway on Hetherton Street.

Along Hetherton Avenue, space would be provided for public plazas, bike parking, and building space for customer service and transit-supportive land uses. The segment of the existing Puerto Suello bike path located on the east side of the proposed site between 4th Street and Fifth Avenue would be realigned around the transit center site. The existing Victorian homes south of Fifth Avenue would either be removed or relocated.

The existing taxi pick-up/drop-off area on East Tamalpais would be removed. A new pick-up/drop-off space for microtransit, taxis, shuttles, and passenger vehicles would be provided on the east side of West Tamalpais Avenue between 3rd Street and Fifth Avenue. Maintenance vehicle parking for five GGT vehicles would be provided on-site at the transit center on the block north of 4th Street, with one additional maintenance vehicle parking space provided on the east side of Tamalpais Avenue between 4th Street and Fifth Avenue.

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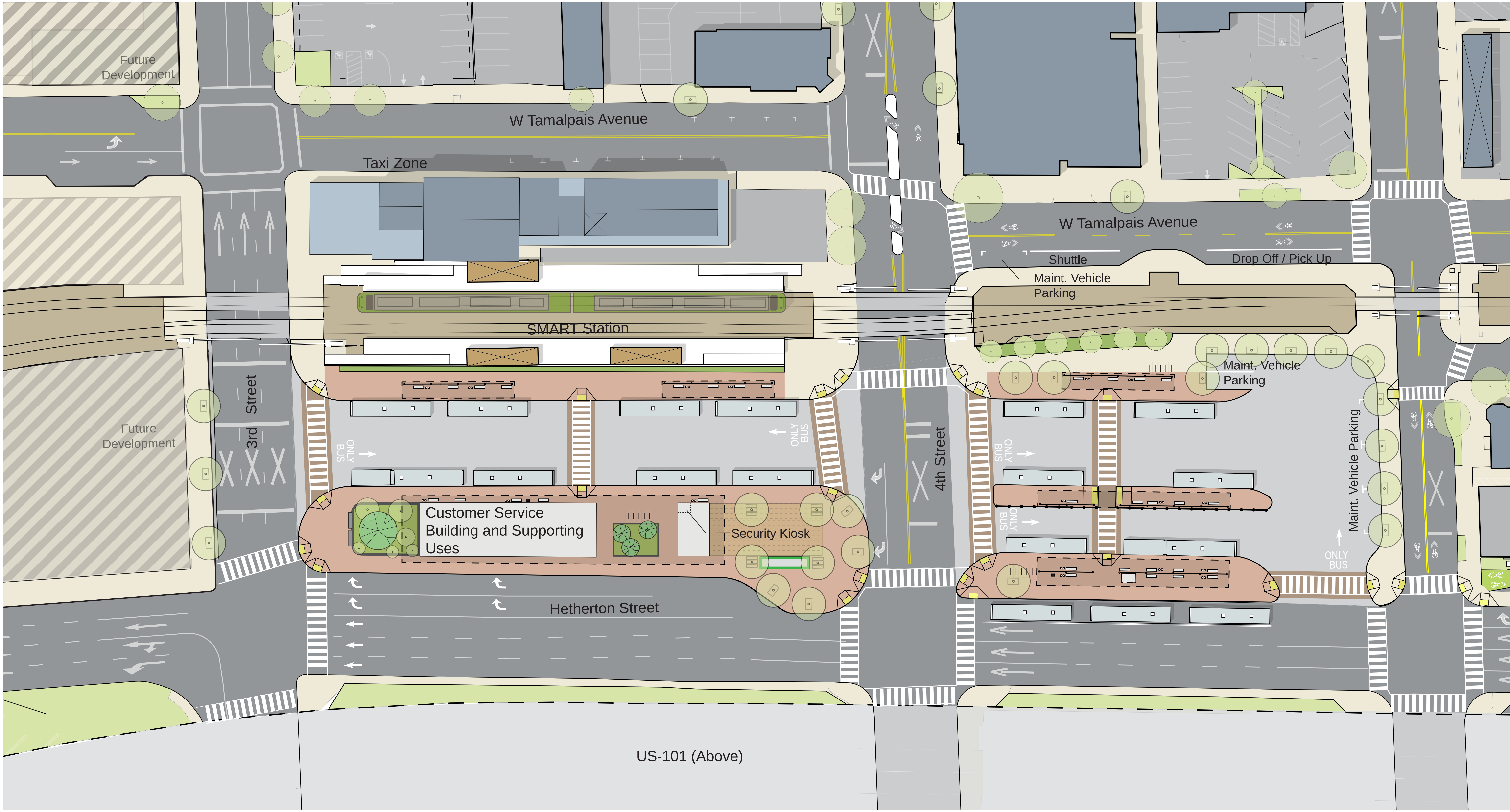

Kimley»Horn

Figure 1-3: 4th Street Gateway Alternative

Under the Freeway Alternative

The Under the Freeway Alternative is shown in Figure 1-4. This concept utilizes the block bound by 4th Street, Hetherton Street, Fifth Avenue, and Irwin Street, and the northern portion of the block bound by Hetherton Street, 3rd Street, 4th Street, and Irwin Street, generally located beneath US 101. Bus bays would be accessed via driveways on 4th Street, Irwin Street, and Hetherton Street.

Space would be provided for public plazas, customer service, and/or transit-supportive land uses in the area outside of the US 101 envelope. This alternative would require three bridges/viaducts over Erwin Creek to connect Hetherton Street to the bus bays. Two bridges would be located on the block north of 4th Street and one would be located on the block south of 4th Street.

The under-freeway portions of this alternative are currently occupied by Caltrans-owned and maintained park & ride lots; this alternative would result in their removal from this location and relocation to a yet-to-be-determined site. Private property would also need to be acquired. Pick-up/drop-off space would be provided on the south side of Fifth Avenue between Irwin Street and Hetherton Street. Space for shuttles and microtransit would be provided along the north side of 4th Street, adjacent to the northern portion of the transit center. Maintenance vehicle parking for three Golden Gate Transit vehicles would be provided on the south side of Fifth Avenue between Irwin Street and Hetherton Street, and parking for an additional three vehicles would be located on the far southern edge of the site south of 4th Street.

Figure 1-4: Under the Freeway Alternative

Whistlestop Block Alternatives

Two alternatives were developed that place the transit center in the same area, centered on the existing Whistlestop building along West Tamalpais Avenue. These two alternatives are considered separately in the Draft Environmental Impact Report; however, they share the same transportation network, with the only difference in access and circulation consisting of a re-alignment of West Tamalpais Avenue. Since the transportation network is nearly identical between the two alternatives, they were modeled together as the Whistlestop Block Alternatives for the purposes of this report.

The Adapt Whistlestop Alternative is shown in Figure 1-5. This alternative co-locates the transit center on the same block as the existing SMART station, by utilizing area from west of West Tamalpais Avenue to 3rd Street, Hetherton Street, and 4th Street. West Tamalpais Avenue between 3rd Street and 4th Street would be limited to buses only, and curbside bays would be provided on both sides of the street. A portion of the curb space on West Tamalpais Avenue would be dedicated to microtransit and shuttles. To the east of the SMART tracks, bus bays would be accessed via driveways on 3rd and 4th Streets. The existing taxi and pick-up/drop-off area on East Tamalpais Avenue would be relocated to a newly constructed access road between 3rd Street and 4th Street a. The Whistlestop building would remain in place and be modified, renovated, and reconfigured to serve as GGT customer service and operations building space. Some of the space within the building could be allocated for non-GGT uses. Maintenance vehicle parking for six GGT vehicles would be provided on the new access road between 3rd Street and 4th Street, adjacent to the pick-up/drop-off area. Eight parking stalls would be provided on the east side of West Tamalpais Avenue between 2nd Street and 3rd Street. A portion of the planned North South Greenway would be installed as part of the project between 2nd Street and 4th Street along West Tamalpais in the form of a raised Class IV two-way cycle track.

The Move Whistlestop Alternative is shown in Figure 1-6. In this alternative, a portion of the Whistlestop building would be relocated to or rebuilt on the west side of West Tamalpais Avenue between 3rd and 4th Streets. As part of this relocation, West Tamalpais Avenue between 2nd and 4th Streets would be shifted east so that it is directly adjacent to the SMART tracks and more closely aligned with West Tamalpais Avenue north of 4th Street. The relocated or reconstructed building would include GGT customer service and operations building space, as well as supporting retail uses. Space on the southwest corner of the intersection of West Tamalpais Avenue and 4th Street would be provided for public plazas, customer service, bike parking, and/or transit-supportive land uses. The taxi and pick-up/drop-off area and six maintenance vehicle parking stalls would be provided on the new access road west of West Tamalpais Avenue. A total of 16 parking stalls would be provided on West Tamalpais Avenue between 2nd Street and 3rd Street. A portion of the planned North South Greenway would be installed as part of the project between 2nd Street and 4th Street along West Tamalpais in the form of a raised Class IV two-way cycle track.

In both Whistlestop Alternatives, a new driveway would be installed on 4th Street between Tamalpais Avenue and Lincoln Avenue to replace the removed driveway on West Tamalpais Avenue that provides access to the condominium complex at Lincoln and 4th Street. This new driveway would also be utilized for egress from the new pick-up/drop-off and maintenance parking access road. An existing curb cut on 3rd Street would be utilized to access the remnant of the existing parcel at the northwest corner of Tamalpais Avenue and 3rd Street, west of the pick-up/drop-off area.

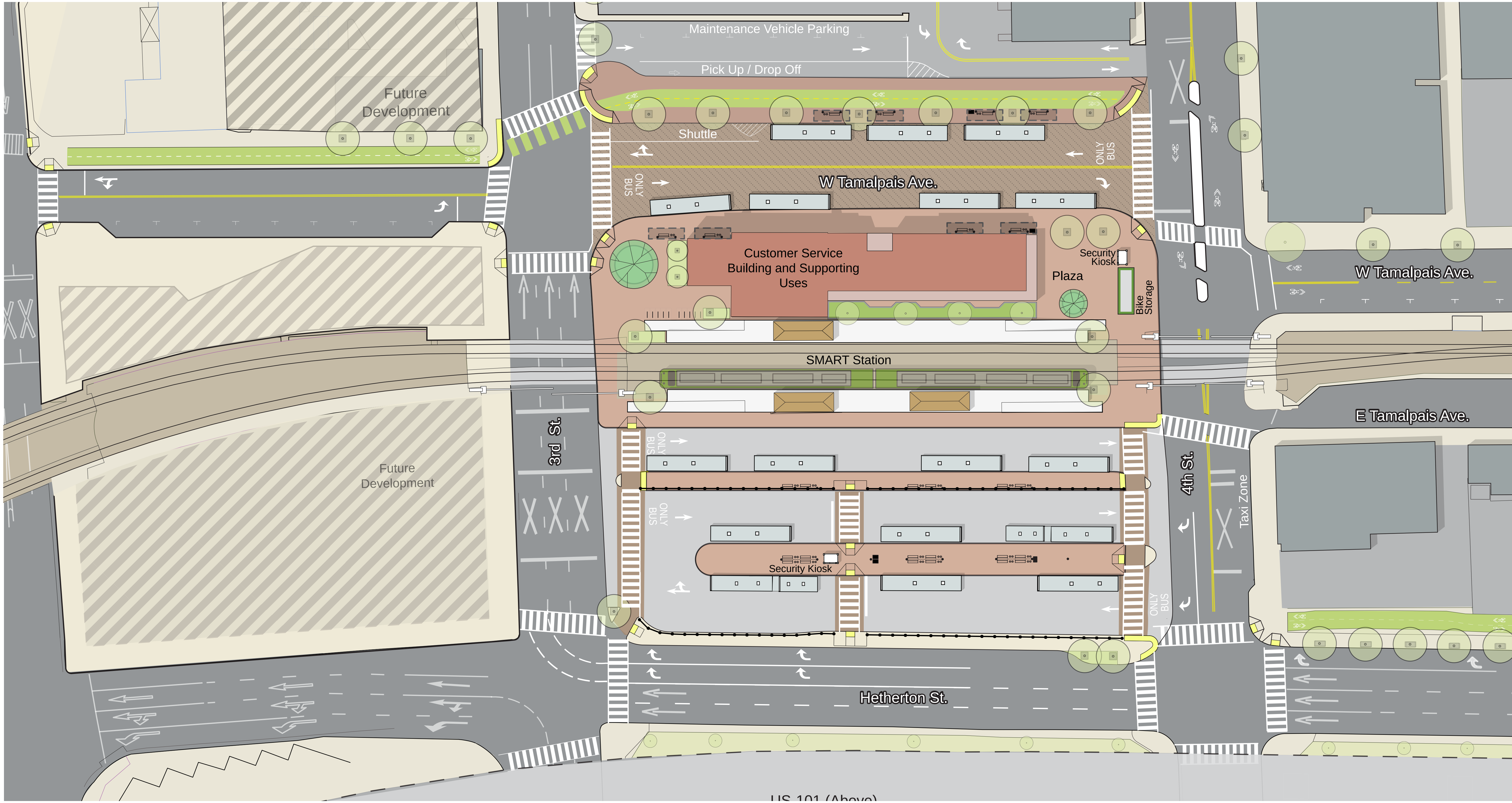

Figure 1-5: Whistlestop Block Alternative

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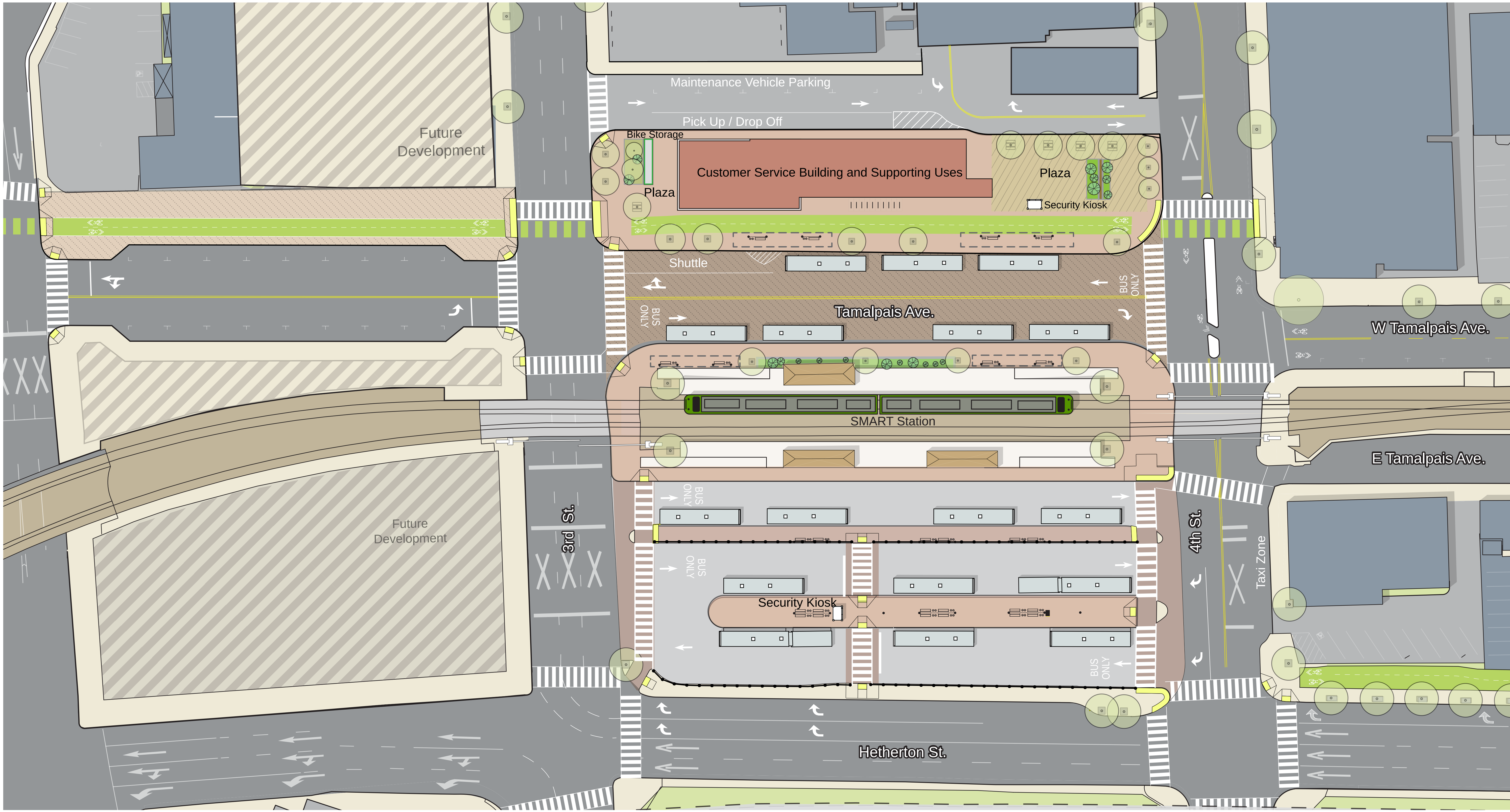


Figure 1-6: Whistlestop Block Alternative - Move Whistlestop

2.0 Analysis Methodology and Data Collection

2.1 Analysis Scenarios

Intersection operations analyses were performed for existing no-build and build conditions (Year 2020), and future (Year 2040) no-build and build conditions. The analyses were conducted to study the impact of relocating the transit center to different locations proposed under the three build alternatives. The following analysis scenarios were performed:

- **Existing Conditions (No-Build Alternative)** – Assumes the existing roadway network, traffic volumes, and transit service, as of January 2020 (the time of the existing data collection period).
- **Existing Conditions (Build Alternatives)** – Assumes the changes to the roadway network and transit routing associated with each build alternative, based on existing traffic volumes.
- **Year 2040 Conditions (No-Build Alternative) –** Assumes growth in traffic (auto, bicycle, and pedestrian) volumes to projected Year 2040 conditions. Includes already built and planned changes to the roadway network. Assumes existing transit service, modified as needed based on roadway network changes.
- **Year 2040 Conditions (Build Alternatives) –** Assumes the changes to the roadway network and transit routing associated with each build alternative and planned roadway network modifications, based on projected Year 2040 traffic volumes.

2.2 Existing Conditions Data Collection

The transportation analysis of existing conditions is based on data collected by the project team and information provided by GGT, Marin Transit, the City of San Rafael, Transportation Authority of Marin (TAM), and SMART.

The project team collected a.m. and p.m. peak hour turning movement volumes, including bicycle and pedestrian volumes, at 42 study intersections in January 2020. These represent conditions prior to the impact of the COVID-19 pandemic. Peak period travel times along 2nd Street, 3rd Street, 4th Street, Irwin Street, and Hetherton Street were also collected in the same month to assist in calibrating the analysis. Queue lengths for the US 101 off-ramps at Mission Avenue and 2nd Street were also collected during peak periods.

All transit information documented and analyzed in this report reflects pre-COVID-19 conditions. GGT, Marin Transit, and SMART provided information on existing transit routes and schedules for pre-COVID-19 conditions.

The Metropolitan Transportation Commission (MTC) provided Clipper transfer data, which was supplemented by farebox data provided by GGT and Marin Transit to determine transfer activity at the transit center.

GGT and Marin Transit provided on-board survey data, which was used to determine activity patterns at the transit center and modes of access and egress.

The City of San Rafael provided existing signal timings and information on planned changes to the bicycle, pedestrian, and roadway network to be accounted for in Year 2040 conditions.

The data provided was supplemented by numerous field visits conducted by the project team.

2.3 Recent Changes to Study Area Geometrics

The Existing Conditions model was built and calibrated to conditions present at the time of data collection in early 2020. Since that time period, the City has implemented several improvements to the transportation network within the study area. These include:

- Conversion of Francisco Boulevard West to one-way southbound operations between 2nd Street and Rice Drive
- Removal of the exclusive southbound left-turn lane on Tamalpais Avenue at 2nd Street
- Removal of the south leg crosswalk and addition of an east leg crosswalk at the intersection of 3rd Street and Hetherton Street and the implementation of leading pedestrian intervals (LPIs)
- Updated signal timing at various intersections in downtown
- Intersection geometry modifications at the US-101/Irwin Street and 2nd Street intersection
- Intersection geometry modifications at the Grand Avenue and 2nd Street intersection

Based on comments received on the Draft EIR, the models for the Whistlestop Block Alternatives (Preferred Alternative) were updated to reflect improvements implemented since January 2020, as of August 2022. All Year 2040 build alternatives models include the implemented improvements.

2.4 Year 2040 Conditions Assumptions

The City of San Rafael provided daily and peak hour model volume plots from the TAM activity-based countywide travel-demand model for Baseline (2019) and Future (Year 2040) conditions; the Future forecasts incorporated the preferred land-use plan from the recently completed 2040 San Rafael General Plan Update. The model plots provided by the City were used to develop traffic volumes for Year 2040 conditions. The model assumes continued growth of transit in the region.

The Year 2040 baseline includes the construction of long-term roadway network improvements planned by the City of San Rafael and are unrelated to the proposed Project.

- Conversion of B Street, C Street, and D Street from one-way to two-way operations
- Conversion of Francisco Boulevard West to one-way southbound operations between 2nd Street and Rice Drive
- Conversion of the following segments of West Tamalpais Avenue:
  - 2nd Street to 3rd Street – convert to one-way operation southbound and removal of the exclusive southbound left-turn lane to 2nd Street
  - 3rd Street to 4th Street – convert to one-way operation northbound
  - 4th Street to Fifth Avenue – close to vehicle traffic
  - Fifth Avenue to Mission Avenue – convert to one-way operation northbound
- The northbound approach to 2nd Street and Grand Avenue would be converted to two through lanes and a 100-foot right-turn pocket
- Addition of a second northbound right-turn lane at 2nd Street and Irwin Street; removal of the existing crosswalks on the north and east legs of the same intersection and construction of new crosswalks on the south and west legs
- Completion of the SMART Multi-Use Path to 2nd Street

It is noted that some of the build alternatives include modifications to these planned network improvements.

2.5 VISSIM Modeling Platform

Technical analysis of the alternatives was performed using the VISSIM micro-simulation platform, which allows for modeling of individual movements as they travel through the roadway network. This micro-simulation model allows the operations of the entire study area network to be considered in an integrated fashion, allowing for the detailed evaluation of upstream and downstream effects of a set of solutions. A critical component of the analysis was understanding how treatments at the individual intersections interact and affect upstream and downstream locations. The VISSIM platform allows for analysis of the integration of auto, transit, bicycle, and pedestrian modes in a dynamic environment, making it sensitive to the effects of changes in circulation patterns such as those anticipated as a result of the Project.

VISSIM is a sophisticated and detailed analysis tool that provides the ability to model complex multimodal traffic interactions, including merge, weave, pedestrian, and bicycle movements. Existing auto, transit, bicycle, and pedestrian activity data was utilized in the micro-simulation model. Roadway geometrics, vehicle/bicycle/pedestrian counts, travel-time data, and signal-timing data were collected and used as inputs to conduct the operation analysis. The VISSIM analysis calculated metrics such as intersection delay, queuing, corridor travel time, vehicle delay, vehicle travel time, and transit travel time. Videos created from the VISSIM model allowed for visual demonstration of conditions with the baseline scenario and each build alternative.

Intersection operations are described using a level of service (LOS) grade, as defined by the *Highway Capacity Manual, 6th Edition* (HCM). The LOS grades range from A to F, with A representing little to no delay and F representing failing conditions with excessive delay. Intersection delay was obtained from the VISSIM model in the form of seconds of delay. This was converted to a level of service using HCM thresholds for delay. It is noted that the VISSIM model does not rely on HCM methodologies and thus the LOS grade provided should be used as a comparative tool only and may not match the findings of an HCM-based analysis.

The VISSIM models created were based on the 1-hour peak period for both the 7:45 to 8:45 a.m. and 4:30 to 5:30 p.m. peak traffic conditions. A 15-minute “seeding” period was added to the beginning of each model run to properly saturate the network. Ten simulation runs were conducted for each model. The results presented in this report are the average of the 10 runs, except where noted.

The models were calibrated to existing conditions (January 2020) in accordance with *FHWA Traffic Analysis Toolbox Volume 3* which is used by Caltrans as guidance for VISSIM model calibration. The models were calibrated to observed traffic volumes and corridor travel time data on 2nd Street, 3rd Street, 4th Street, Hetherton Street, and Irwin Street. To ensure proper calibration, the model’s behavior and characteristics were adjusted for both the morning and afternoon peak so that each of the measured corridors were within 30 percent of the field-conducted travel times.

2.6 Traffic Conditions

As all build alternatives primarily represent a shifting of bus activity from one location to another; the Project does not change the amount of bus service to be provided nor are new vehicle trips assumed to be generated. Each of the three build alternatives include some limited changes to the local roadway network, which affect traffic circulation. Additionally, the shifting of the transit center results in a different circulation pattern for buses on local streets.

To determine the impacts associated with the roadway configuration changes, shift in traffic volumes, and shift in bus circulation, intersections were analyzed for Existing and Year 2040 traffic operations.

Delay and LOS analyses are provided for both the a.m. and p.m. peak hours. Intersection analysis locations encompass the anticipated area of traffic effects associated with the build alternatives. In total, 42 distinct intersection locations were analyzed during both peak hours for all analysis scenarios. The locations of the study intersections are shown in Figure 2-1.

Count data collected by the project team was used to develop model volumes for existing conditions. Year 2040 volumes for the baseline VISSIM models were developed by applying annual growth rates derived from TAM countywide activity-based travel-demand model runs produced based on 2040 San Rafael General Plan Update land uses. Separate annual growth rates were derived separately for four quadrants of the study area; 4th Street delineated between the northern and southern quadrants of the model and US 101 delineated between the eastern and western quadrants. The annual growth rates were applied to volumes within each quadrant of the model.

For roadway network changes assumed under the Year 2040 baseline and all of the build alternatives, it was assumed that any vehicular movements which would be affected by network changes would be redistributed through an alternate route through the network. For example, in the instance that a right-turn lane was proposed to be removed, a new route for the right-turn volumes at that location was determined, and volumes for all conditions in which the right-turn lane is removed were adjusted to reflect these redistributed volumes.

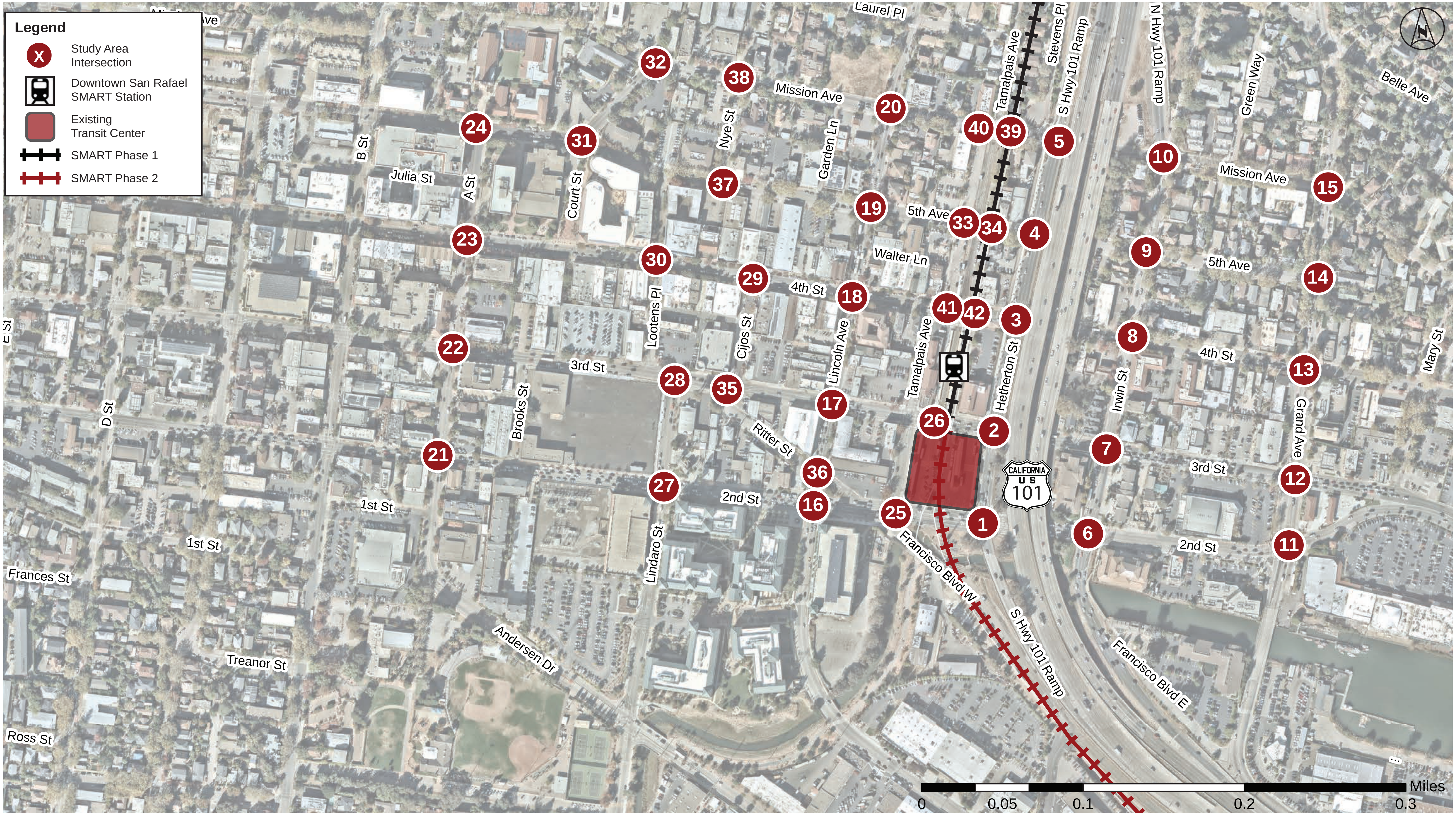
The VISSIM models were used to develop movement-level and intersection-level average vehicular delay. These metrics were developed by running multiple instances of the microsimulation model and producing averages for vehicle delay at each intersection.

Based on intersection-level delay, each intersection was assigned a LOS designation from A to F using the following criteria, which are based on thresholds from the HCM. The HCM includes methodology for estimating average vehicle delay based on inputs related to signal timing, volume, and lane geometry for each individual intersection; for this analysis, the microsimulation models were used in lieu of HCM methodology. The LOS designations assigned to each intersection are thus based only on the following thresholds listed in the HCM:

- LOS A – Negligible delays. No approach phase is fully utilized, and no vehicle waits longer than one red indication. Average control delay is less than 10 seconds per vehicle for both signalized and unsignalized intersections.
- LOS B – Minimal delays. An occasional approach phase is fully used. Drivers begin to feel restricted. Average control delay is 10 to 20 seconds per vehicle for signalized intersections and 10 to 15 seconds per vehicle for unsignalized intersections.

- LOS C – Acceptable delays. Major approach phase may become fully used. Most drivers feel somewhat restricted. Average control delay is 20 to 35 seconds per vehicle for signalized intersections and 15 to 25 seconds per vehicle for unsignalized intersections.
- LOS D – Tolerable Delays. Drivers may wait through no more than one red indication. Queues may develop but dissipate rapidly without excessive delays. Average control delay is 35 to 55 seconds per vehicle for signalized intersections and 25 to 35 seconds per vehicle for unsignalized intersections.
- LOS E – Major Delays. Volumes approaching capacity. Vehicles may wait through several signal cycles and long vehicle queues form in advance of the signal. Average control delay is 55 to 80 seconds per vehicle for signalized intersections and 35 to 50 seconds per vehicle for unsignalized intersections.
- LOS F – Excessive delays. Represents conditions at capacity, with extremely long delays. Queues may block upstream intersections. Average control delay is greater than 80 seconds per vehicle for signalized intersections and greater than 50 seconds per vehicle for unsignalized intersections.

It is noted that LOS is no longer a component in identifying transportation impacts as part of CEQA analysis. This information is provided for information purposes only to identify changes in localized congestion as a result of the project alternatives.


Legend
Study Area Intersection
Downtown San Rafael SMART Station
Existing Transit Center
SMART Phase 1
SMART Phase 2
Mission Ave
Laurel Pl
Tamalpais Ave
Stevens Pl
S Hwy 101 Ramp
N Hwy 101 Ramp
Green Way
Belle Ave
Mission Ave
5th Ave
Walter Ln
4th St
3rd St
2nd St
1st St
Julia St
B St
A St
Court St
Nye St
Garden Ln
Lootens Pl
Cijos St
Lincoln Ave
Hetherton St
Irwin St
Grand Ave
Mary St
E St
D St
Brooks St
Ritter St
Lindaro St
Francisco Blvd W
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Frances St
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101
0
0.05
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Miles

Under CEQA, significance thresholds for transportation impacts are determined based on changes in vehicle miles traveled (VMT) resulting from the Project. As a transit-supportive project, this Project by nature does not generate any new trips and thus does not increase VMT as a result of new trips.

Localized traffic effects resulting from the minor roadway network changes, and changes to bus circulation patterns, were analyzed and are discussed in this report, but they are assumed to result in negligible VMT effects. As a result, this report largely serves to document an understanding of the Project's localized effects on traffic and circulation. The project does not increase VMT and thus does not result in any significant traffic impacts.

2.7 Transit

The Project includes implementation of a new transit center that will benefit riders by providing enhanced amenities, including waiting areas, customer service, lighting, and public spaces. Each transit center is designed with straight bus bay curbs which provide flexibility for future changes in transit fleet composition, such as larger articulated buses or smaller microtransit vehicles. The Project is also intended to improve bus operations by improving operational flexibility, thereby improving functional capacity. By relocating the transit center, bus route alignments will need to change to serve the new location. Modified bus route alignments were developed for each project alternative and included in the respective VISSIM models.

Transit service for existing conditions reflects service deployed prior to impacts from the COVID-19 pandemic. Transit service for Year 2040 baseline conditions reflects the same level of transit service, with modifications to bus route alignments to reflect planned roadway network changes unrelated to the Project. While it is likely that transit services will change between Year 2020 and Year 2040, the nature of those changes is not known and cannot be reasonably foreseen. Therefore, the Year 2040 scenario reflects current transit service levels on top of future traffic volumes and roadway network.

The transit analysis documented in this report primarily focuses on a quantitative analysis of the effects of each alternative on bus circulation time and reliability. These were determined through the modeling of alternatives in VISSIM. Bus circulation was quantified based on the total circulation time of individual bus routes traveling through the microsimulation model for each peak hour; the estimated circulation time for each route was determined by taking the average circulation time of 10 runs of the model.

2.8 Bicycle and Pedestrian Activity

The effects of the Project on bicycle and pedestrian activity were evaluated though a combination of qualitative and quantitative means. Existing bicycle and pedestrian volumes were collected for existing conditions; Year 2040 pedestrian volumes were projected based on the same quadrant-based annual growth rates derived from the TAM travel-demand model that were applied to vehicle volumes.

Pedestrian activity in the vicinity of transit center was re-routed for each of the build alternatives based on existing pedestrian patterns and modified pedestrian routes with each respective potential new transit center location. Pedestrian trips were assumed to continue to the same destinations as they do today and were re-routed accordingly. For example, existing pedestrian patterns indicate the strongest demand for pedestrian movements from the transit center to/from Downtown San Rafael to the north of 3rd Street. With each of the build alternatives, this existing demand for crossing 3rd Street was shifted north of 3rd Street and pedestrian volumes adjusted accordingly.

The alternatives were evaluated against several criteria relating to pedestrian and bicycle activity, including:

- Connectivity to downtown
- Connectivity to local destinations
- Pedestrian conflicts on site periphery and pedestrian paths of travel
- Pedestrian connectivity within the transit center
- Pedestrian connectivity between SMART and buses

2.9 Parking

The build alternatives' effects on public parking are limited to the following:

- Loss of on-street public parking as a result of the transit center site utilizing space that is currently used for public on-street parking, or the addition of new on-street parking
- Loss of off-street public parking as a result of the transit center site utilizing space that is currently used for public parking

The analysis in this report identifies the quantity of parking spaces affected.

3.0 Transit Conditions

3.1 Existing Transit Service

At the time of the existing conditions analysis period, the transit center was serviced by GGT, Marin Transit, SMART, Sonoma County Transit, Sonoma County Airport Express, and Greyhound. The transit center has 17 bus bays on-site with amenities including bus shelters with benches and trash receptacles, wayfinding, driver facilities, customer service kiosks, retail space, and real-time arrival and departure displays. Although most bus bays are located off-street, there are on-street bus bays located on Hetherton Street. Pick-up/drop-off space is located on Tamalpais Avenue. Prior to the extension of SMART to Larkspur, the transit center included space for taxis off-street. Taxis were relocated to East Tamalpais Avenue with the SMART Larkspur extension project.

The analysis described in this report is based on existing transit conditions before the COVID-19 pandemic. Existing bus routing at the transit center is shown in Figure 3-1 and reflects conditions prior to March 2020. Since the pandemic, some services, such as the airport shuttles and Sonoma County Transit, have temporarily halted service to the transit center.

Golden Gate Transit

GGT primarily serves Marin and Sonoma counties, and also provides commute service to San Francisco and Contra Costa County. GGT provides service to SRTC through the following routes: Route 27, Route 30, Route 40/40X, Route 70, and Route 101. Figure 3-2 shows the GGT service map for Marin County.

Marin Transit

Marin Transit primarily serves Marin County and provides service to SRTC through the following routes: Route 17, Route 22, Route 23/23X, Route 29, Route 35, Route 36, Route 49, Route 68, Route 71/71X, Route 122, Route 125, Route 145, Route 228, Route 233, Route 245, Route 257. Figure 3-3 shows the Marin Transit service map. They also offer a microtransit service, Marin Transit Connect, which is an on-demand service that operates in a select service area of about 2.5 miles from SMART stations in Marin County. There are additional areas of coverage, all of which can be accessed through the Uber app.

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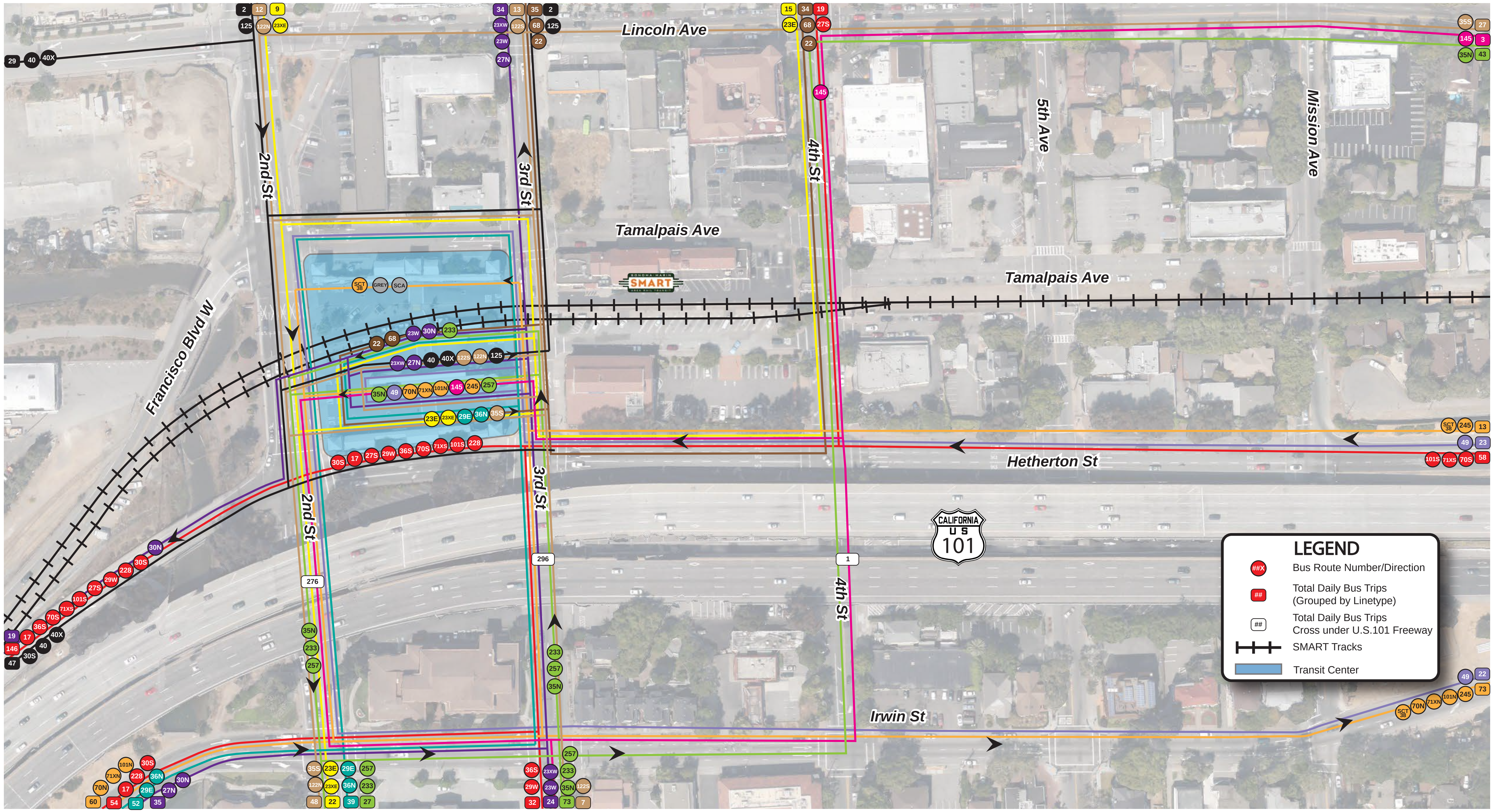

Figure 3-1: Existing SRTC Bus Routing