



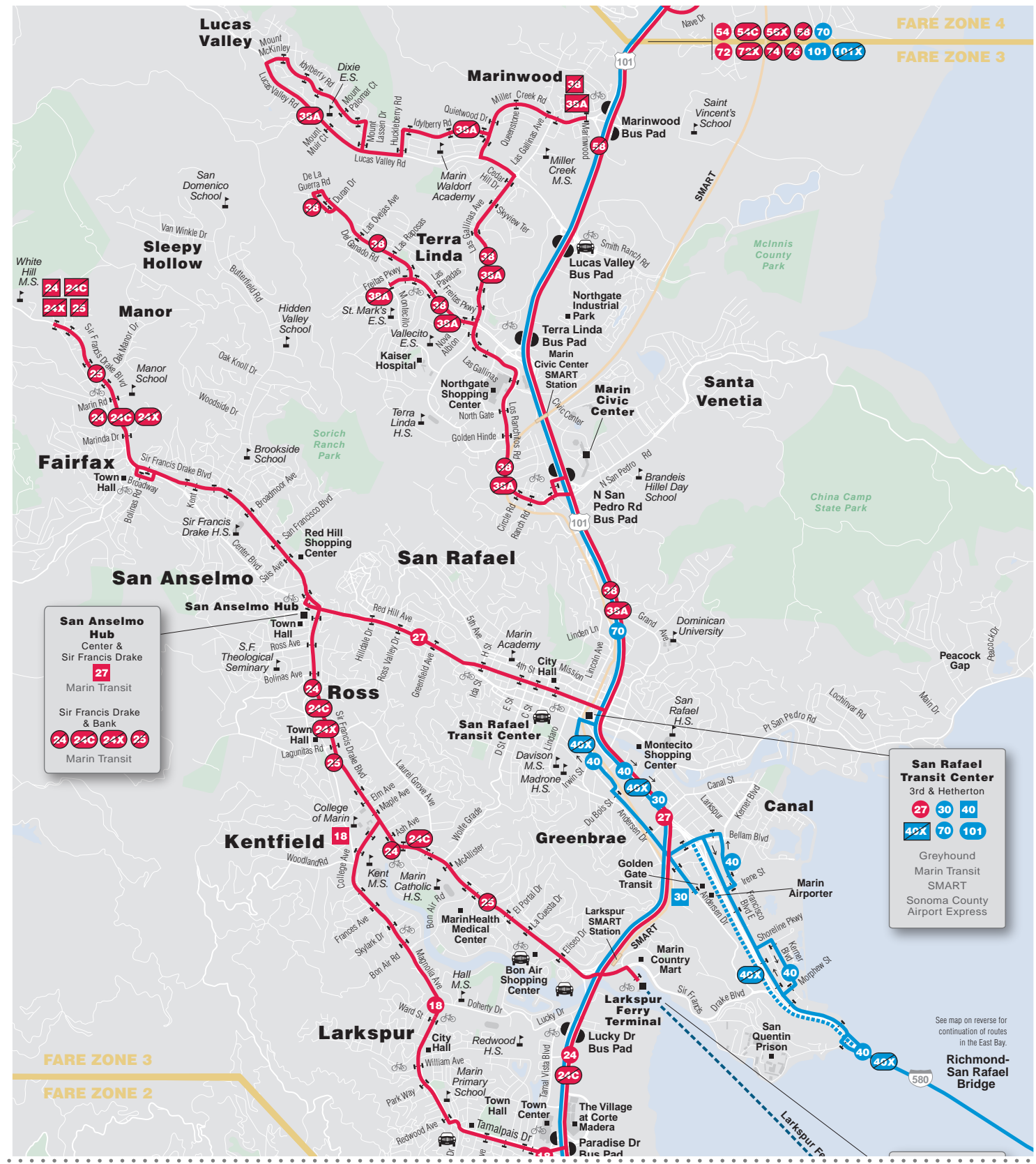
# SAN RAFAEL TRANSPORTATION CENTER

Relocation Analysis, Environmental Clearance, and Preliminary Design



- Route Temporarily Suspended  
Updated schedules at goldengate.org
  - Commute Routes
  - Regional Routes
  - Limited Service
  - Bus Route Number
  - Bus Route Terminus
  - Ferry Routes
  - Other Ferry Routes
  - Bus Stop
  - Bus Pad
  - Park & Ride
  - Bike Rack
  - Fare Zone Boundary
- Novato**  
Redwood & Grant Transfer Point
- Call 511 toll free for trip-planning assistance

rev 200913



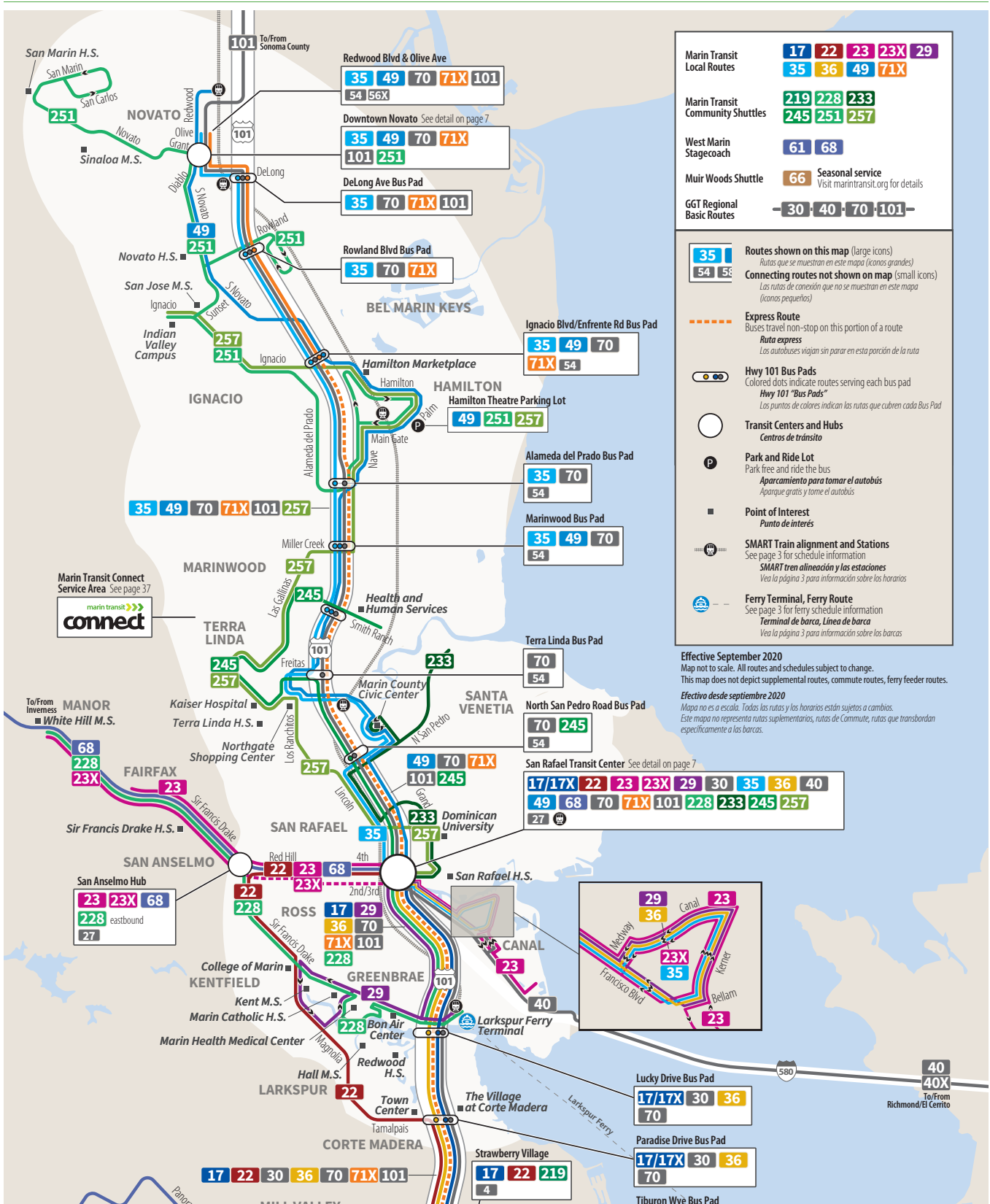
Source: Golden Gate Transit

Figure 3-2: Golden Gate Transit System



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## SMART

SMART is a passenger-rail service that provides service in Marin and Sonoma County. The San Rafael SMART station is located at 3<sup>rd</sup> Street between West and East Tamalpais Avenue. This stop serves as a transfer point for bus riders at SRTC. SMART service terminates to the south near the Larkspur Ferry Terminal and to the north at Sonoma County Airport. Figure 3-4 shows the existing and planned SMART system map.

**Figure 3-4: SMART System Map**



## Sonoma County Transit

Sonoma County Transit provides transit locally within Sonoma County, and also provides select routes connecting to regional destinations. The agency provided one route (Route 38) which terminated at SRTC; this route has been suspended during the COVID-19 pandemic and Sonoma County Transit has yet to establish a reopening date.

## Sonoma County Airport Express

Sonoma County Airport Express provides scheduled transportation from Sonoma County to San Francisco International Airport (SFO) and Oakland International Airport (OAK). The airport express has scheduled stops at SRTC.

## Greyhound

Greyhound is an intercity bus carrier serving destinations nationwide throughout the United States. Currently, Greyhound stops at SRTC twice a day.

## Boardings and Transfer Activity

A summary of daily boardings GGT and Marin Transit services at SRTC is provided in Table 3-1. The transit center experiences 4,440 daily boardings on weekdays, not including ridership on airport shuttles, Greyhound buses, Sonoma County Transit Route 38, or SMART. Also not included in the table are taxis or subsidized TNC trips through the Marin Connect program. The busiest transfer activity at the transit center occurs between Marin Transit Routes 35 and 36. GGT Routes 40, 70, and 101 and Marin Transit Route 17 also have strong transfer activity at the transit center.

**Table 3-1: Daily San Rafael Transit Center Golden Gate Transit and Marin Transit Bus Boardings**

Route	Average Daily Boardings
17	384
22	192
23	234
23X	43
27	86
29	140
30	181
31	18
35	835
36	515
40	366
44	7
49	204
68	39
70	336
71X	167
101	341
122	47
125	3
145	45
228	79
233	34
245	79
257	65
<b>Total</b>	<b>4,440</b>

*Source: Marin Transit and Golden Gate Transit, 2017*

Figure 3-5 provides a summary of transfer activity that occurs at the SRTC. The analysis found that on a daily basis, 35 percent of daily bus boardings at the transit center are GGT/Marin Transit transfers. This percentage is based only on transfers that can be tracked through fares; this includes either recorded uses of paper transfer tickets, or transfers recorded in the Clipper system. Riders not utilizing transfer tickets or Clipper to make transfer movements are not captured in this analysis.

The largest driver of transfer activity is transfers between east-west routes and north-south bus routes providing service along US 101. Route 35 is the greatest generator of transfer activity, accounting for 569 transfers to or from that route. Transfer activity at the transit center peaks between 4 p.m. and 5 p.m., with 167 transfers occurring during that hour alone. Morning peak activity occurs between 7 a.m. and 9 a.m., with an average of 136 transfers occurring per hour during that period.

Figure 3-6 shows route-to-route transfer activity at the transit center. The high level of transfers suggests the need to ensure that the transit center facilitates this activity. Strong transfer pairs should be located near each other to minimize transfer times. The transit center operates on a pulse system, with multiple routes having coordinated arrival and departure times within a 5-minute pulse period.



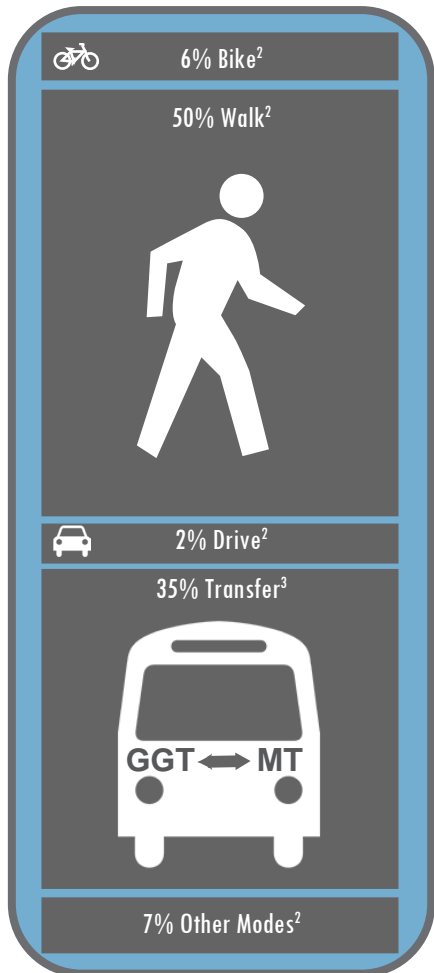
# SAN RAFAEL TRANSPORTATION CENTER

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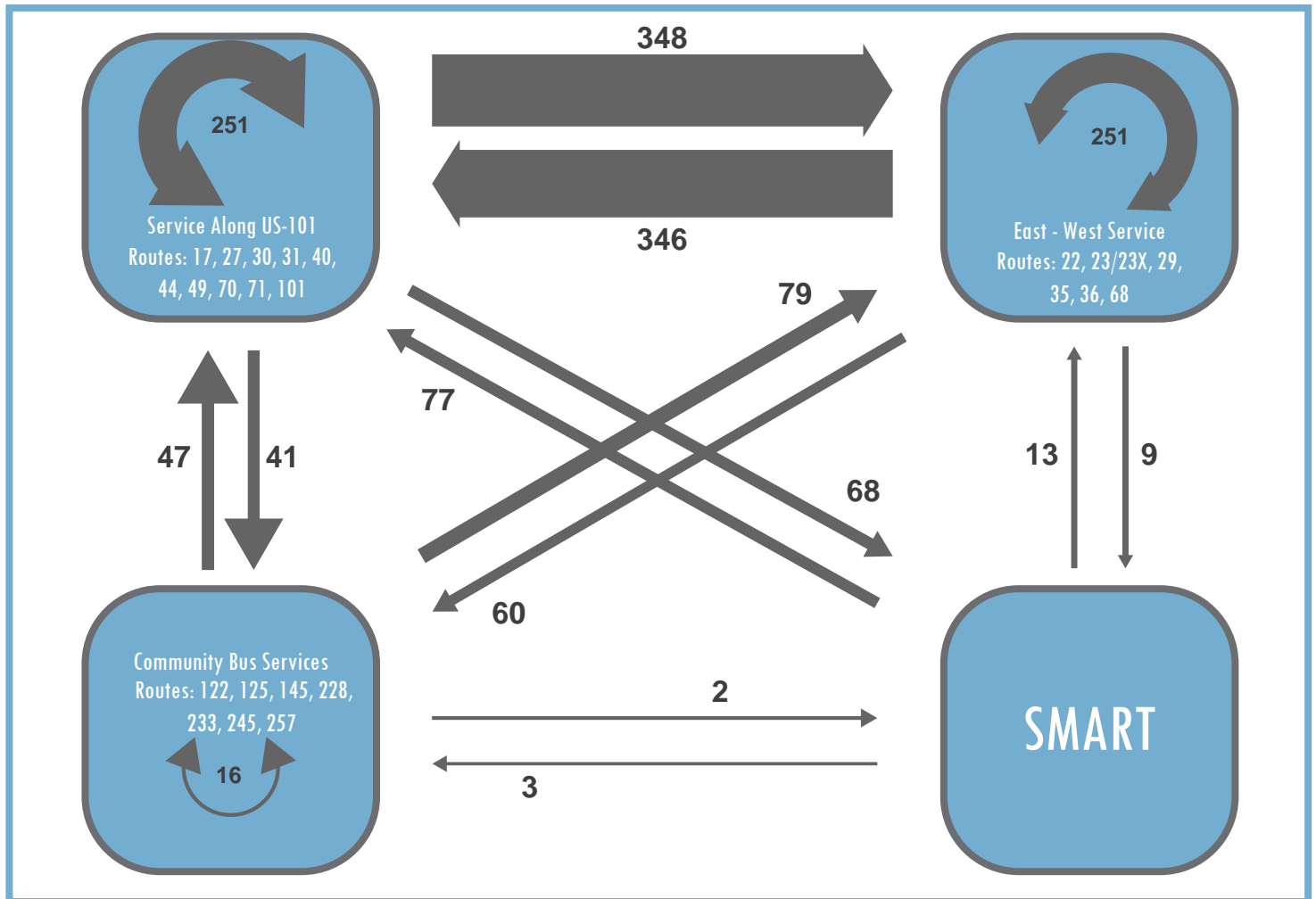
## Mode of Access for GGT and MT Bus Boardings at SRTC

Average Daily Boardings: 4,440 Passengers<sup>1</sup>



## GGT/MT/SCT/SMART Transfer Activity

Average Daily Transfer Activity - 1,612 Passengers<sup>3</sup>



1 - Golden Gate Transit Ridership from 2017 and Marin Transit Ridership from 2017

2 - Mode splits based on on-board surveys provided by Marin Transit (2017) and Golden Gate Transit (2015)

3 - Golden Gate Transit GFI, Marin Transit GFI, and MTC Clipper Data (each data source from October/November 2017)



# SAN RAFAEL TRANSPORTATION CENTER

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2017 Average Weekday Transfers Between Transit Routes Serving the San Rafael Transit Center

Transfer Issued	Transfer Received																										Total
	17	22	23	27	29	30	31	35	36	40	44	49	68	70	71	101	122	125	145	228	233	245	257	38	SMART		
17	4.8	3.1	2.7	0.8	2.3	5.7	0.0	34.1	13.9	9.0	0.0	2.1	0.9	8.6	2.8	2.4	0.5	0.0	0.0	2.2	1.6	0.6	2.6	0.0	2.8	103	
22	5.0	5.2	5.5	1.4	4.1	2.6	0.1	20.2	5.0	7.2	0.0	2.4	1.8	7.0	0.2	3.7	0.4	0.3	0.0	3.0	1.2	2.0	0.8	0.0	3.3	83	
23	8.3	2.1	2.9	2.3	0.8	0.6	0.0	11.9	12.0	4.9	0.2	6.3	1.9	5.7	0.8	16.9	0.5	0.2	0.3	3.1	0.5	0.8	0.9	0.0	1.0	85	
27	0.4	1.5	2.4	0.3	0.8	0.6	0.0	5.6	4.3	1.7	0.1	2.4	0.9	2.1	0.9	1.5	0.1	0.1	0.0	0.6	0.7	0.2	0.2	0.3	5.5	33	
29	1.8	0.3	0.6	0.1	0.1	3.0	0.1	3.0	1.6	0.4	0.1	0.4	0.0	1.6	0.2	1.0	0.0	0.0	0.1	0.3	0.2	0.9	0.1	0.0	0.6	16	
30	2.3	2.2	2.5	0.4	0.6	2.4	0.0	27.8	6.8	5.3	0.0	1.4	0.9	5.2	2.3	2.4	0.1	0.0	0.0	0.4	0.2	0.2	0.4	0.0	3.0	67	
31	0.0	0.1	0.2	0.1	0.0	0.1	0.0	0.5	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	34.2	35	
35	43.4	11.3	14.9	6.0	4.1	35.1	0.2	19.6	25.4	10.0	0.1	11.9	4.4	46.4	1.3	11.8	1.4	0.1	1.5	6.0	5.4	5.0	6.6	0.0	0.4	272	
36	24.7	10.7	18.6	2.5	2.2	6.1	0.0	31.9	10.4	6.8	0.3	11.0	2.5	14.5	3.5	15.7	2.2	0.1	3.9	2.6	1.5	5.3	0.1	0.0	3.4	181	
40	11.1	4.4	4.3	0.5	0.6	3.5	0.0	12.2	4.9	2.0	0.1	6.4	2.1	12.2	2.9	6.5	0.9	0.1	0.1	1.9	0.5	1.7	1.9	0.0	10.0	91	
44	0.1	0.1	1.0	0.0	0.1	0.3	0.0	0.4	0.9	0.0	0.2	0.0	0.0	0.1	0.0	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.4	0.1	4	
49	5.7	1.3	13.3	1.6	2.1	2.1	0.0	14.8	23.6	7.6	0.1	5.0	1.4	4.3	1.0	5.4	0.7	0.0	0.1	1.9	3.0	0.8	1.6	0.0	0.2	97	
68	0.9	0.7	2.4	0.5	0.4	1.4	0.0	6.8	4.1	2.9	0.0	1.1	1.7	2.0	0.7	1.2	0.3	0.1	0.0	1.1	0.5	0.6	0.0	0.0	0.1	29	
70	16.2	6.5	4.4	1.6	5.1	3.2	0.1	44.0	9.2	9.7	0.0	4.9	1.1	3.6	0.5	8.2	0.7	0.1	0.0	2.3	1.5	2.4	0.7	0.0	3.3	129	
71	1.2	1.1	1.5	1.3	0.7	0.2	0.1	2.9	5.6	2.4	0.0	1.1	0.2	1.6	0.1	1.4	0.1	0.0	0.0	0.2	0.1	0.2	0.2	0.0	0.6	23	
101	8.4	3.3	19.3	1.6	3.0	1.7	0.1	19.5	16.5	7.8	0.2	8.2	1.8	12.7	1.8	4.4	1.0	0.1	0.1	2.8	0.7	0.8	2.0	0.1	8.0	126	
122	0.2	0.1	0.3	0.1	0.0	0.5	0.0	2.5	0.8	0.5	0.0	0.5	0.4	1.1	0.2	0.4	0.1	0.0	0.1	0.4	0.1	0.1	0.2	0.0	0.0	9	
125	0.1	0.1	0.3	0.0	0.1	0.1	0.0	0.3	0.2	0.4	0.0	0.4	0.1	0.0	0.0	0.3	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.1	2	
145	0.1	0.0	2.0	0.0	0.1	0.0	0.0	1.9	2.4	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	1.1	0.1	0.0	0.0	0.0	8	
228	1.5	1.0	8.3	0.4	0.8	0.3	0.0	7.4	2.1	0.9	0.0	0.6	1.4	1.7	0.9	0.2	1.4	0.0	0.0	1.9	0.4	0.2	0.6	0.0	1.1	33	
233	2.5	1.0	1.0	0.7	1.3	2.6	0.0	9.0	0.8	2.2	0.1	1.0	0.3	1.6	0.1	0.8	0.1	0.0	0.0	0.3	0.5	0.7	0.2	0.0	0.1	27	
245	1.5	1.0	2.9	0.8	2.3	3.2	0.0	7.0	3.5	2.1	0.1	0.4	0.3	0.7	0.1	2.9	0.8	0.0	0.0	0.5	1.6	1.4	0.2	0.0	0.2	33	
257	4.6	0.5	0.7	0.6	0.4	0.1	0.0	11.1	3.1	2.0	0.0	2.2	0.3	2.6	0.4	0.2	0.4	0.0	0.0	0.7	0.3	0.9	1.1	0.0	0.2	33	
38	0.0	0.0	0.0	0.5	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	1	
SMART	3.9	4.4	2.7	12.4	0.8	5.4	29.4	2.4	2.1	12.0	0.0	0.0	0.2	6.1	0.8	6.4	0.1	0.0	0.0	2.0	0.1	0.0	0.8	0.0	-	92	
Total	149	62	115	37	33	81	30	297	159	98	2	70	25	141	21	94	12	1	6	34	22	25	21	1	78	1,612	

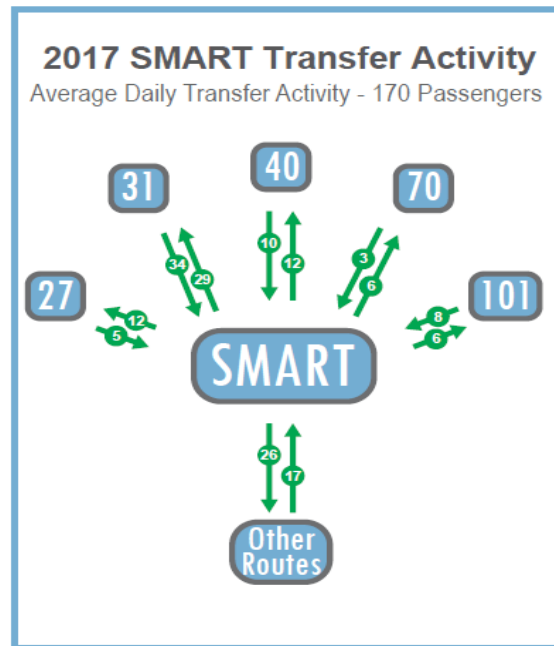
Key Transfer Route Pairs (Top 20)

Data Source: October 2017 GFI and Clipper Transaction Data. Some transfers shown may occur at locations other than the SRTC.

Figure 3-5 also identifies mode of access for SRTC passengers; on-board survey data was used to assess modes of access for passengers not making a transfer. With the limited number of surveys received, this information should be considered approximate. Half of all passengers boarding a bus at the transit center arrive by walking, making pedestrian connections to the transit center a critical element of a new transit center. Six percent of passengers access the transit center by bike; providing adequate bike parking and providing connectivity to the San Rafael bicycle network will support improved access for these riders.

At the time of the transit ridership data collection for this project (2017), SMART had recently opened its initial operating segment and had yet to extend to Larkspur. At the time, the SMART system observed an average of 2,100 weekday boardings; detailed station-level ridership information was not made available. Anecdotally, the Downtown San Rafael station is known to be one of the busiest in the system. Figure 3-7 shows 2017 transfer activity between SMART and the top five bus routes with SMART transfer activity. It is anticipated that SMART transfer activity has changed since the period of data collection. With the extension of SMART to Larkspur, Route 31 was eliminated. It is expected that SMART transfer activity to other routes will increase as SMART ridership increases. At the time of the data collection, Route 31 was the route with the highest level of transfer activity with SMART at the SRTC.

**Figure 3-7: SMART Transfer Activity (Data Source: MTC Clipper Data)**



### 3.2 Existing Transit Circulation – Baseline (No-Build Alternative)

Microsimulation results for bus circulation are shown in Table 3-2. Detailed results for bus circulation and reliability by route can be found in Appendix A. The appendix shows the average circulation time through the model for each route as well as the standard deviation of that circulation time. A greater standard deviation represents greater variability in the circulation time through the study area. Greater variability in bus circulation time causes additional operational challenges, often resulting in longer trip times, higher operating cost, and longer wait times for riders. Note that the circulation time does not represent the total travel time for all routes; rather, it represents the total travel time within the model study area only. It is not anticipated that the Project will result in changes to bus travel time outside of the model study area. These results serve as a baseline against which the build alternatives and Year 2040 conditions will be compared.

**Table 3-2: Existing Baseline Conditions (No-Build) – Total Transit Circulation Time in Network**

	Existing A.M.	Existing P.M.
Circulation Time	27,492 sec	25,739 sec

### 3.3 Existing Transit Circulation – Build Alternatives

The primary change from the existing No-Build Alternative to the existing build alternatives is simply the rerouting of bus alignments to reach the new location of the transit center. The assumed routing changes, and the measured effects on bus circulation, are detailed for each build alternative in their respective sections below. In addition, since roadway improvements constructed since the existing data collection period (January 2020) are reflected in the build models, results indicate the effects of those changes.

#### 4<sup>th</sup> Street Gateway Alternative

A bay assignment and local routing scheme were developed for the 4<sup>th</sup> Street Gateway Alternative and are shown in Figure 3-8. Aside from these changes to route alignments, the only other factor affecting changes to bus circulation in this alternative is the redistribution of auto traffic. Auto traffic patterns are modified due to the removal of the right-turn movement from Hetherton Street to 4<sup>th</sup> Street and the removal of East Tamalpais Avenue between 3<sup>rd</sup> Street and 4<sup>th</sup> Street.

The total bus circulation times are shown in Table 3-3. More detailed results for the alternative can be found in Appendix A.

**Table 3-3: 4<sup>th</sup> Street Gateway (Year 2020) – Total Transit Circulation Time in Network**

Scenario	Existing A.M.	Existing P.M.	4 <sup>th</sup> Street Gateway A.M.	4 <sup>th</sup> Street Gateway P.M.
Circulation Time	27,492 sec	25,739 sec	25,550 sec	24,133 sec
% Change from Baseline			-7%	-6%





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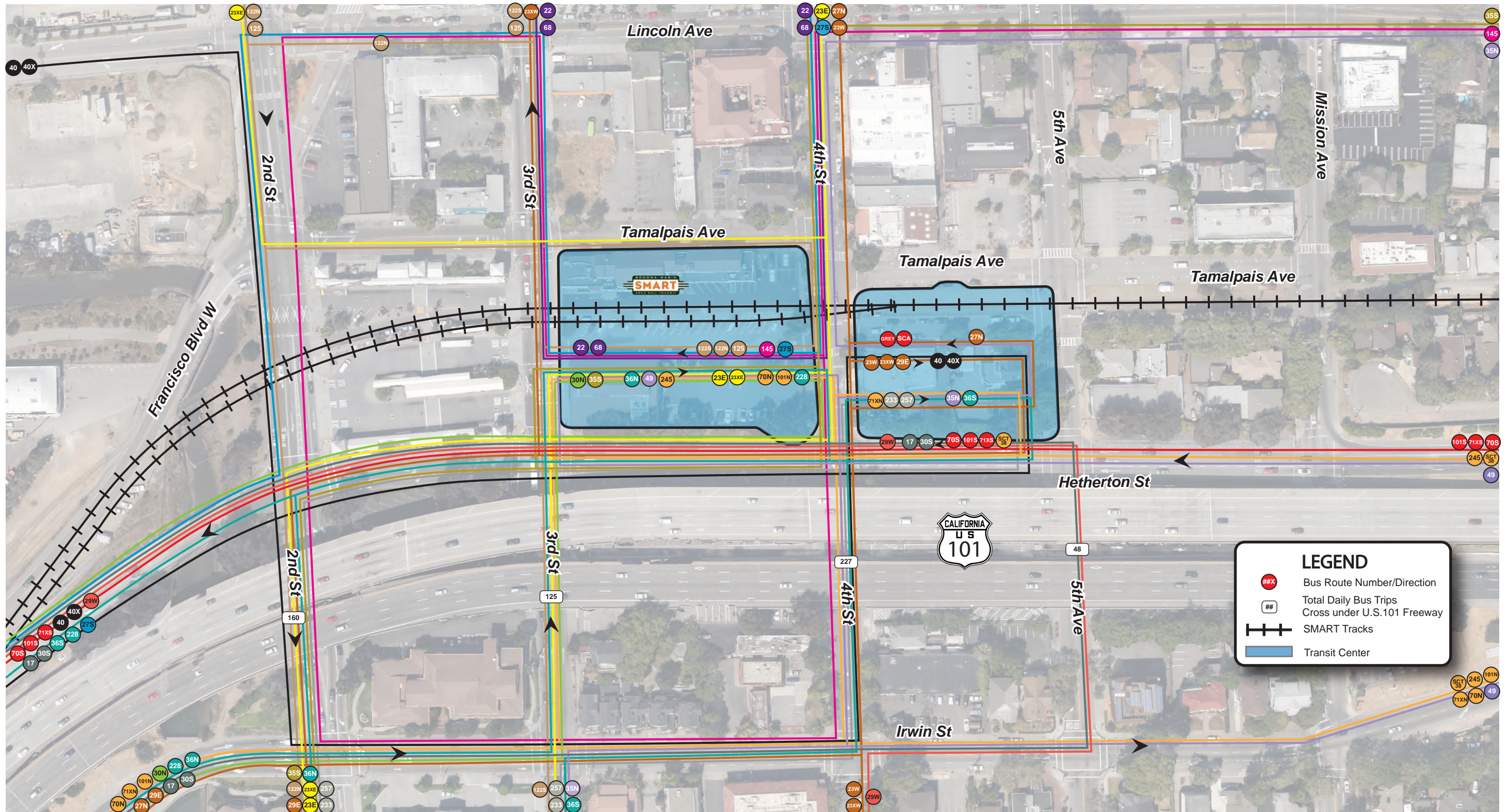


Figure 3-8: 4th Street Gateway - Existing Bus Routing

### Under the Freeway Alternative

A bay assignment and local routing scheme were developed for the Under the Freeway Alternative and are shown in Figure 3-9. This alternative does not include any geometric changes to the network other than the location of transit center driveways.

The total bus circulation times are shown in Table 3-4. More detailed results for the alternative can be found in Appendix A.

**Table 3-4: Under the Freeway (Year 2020) – Total Transit Circulation Time in Network**

Scenario	Existing A.M.	Existing P.M.	Under the Freeway A.M.	Under the Freeway P.M.
Circulation Time	27,492 sec	25,739 sec	21,863 sec	22,487 sec
% Change from Baseline			-20%	-13%



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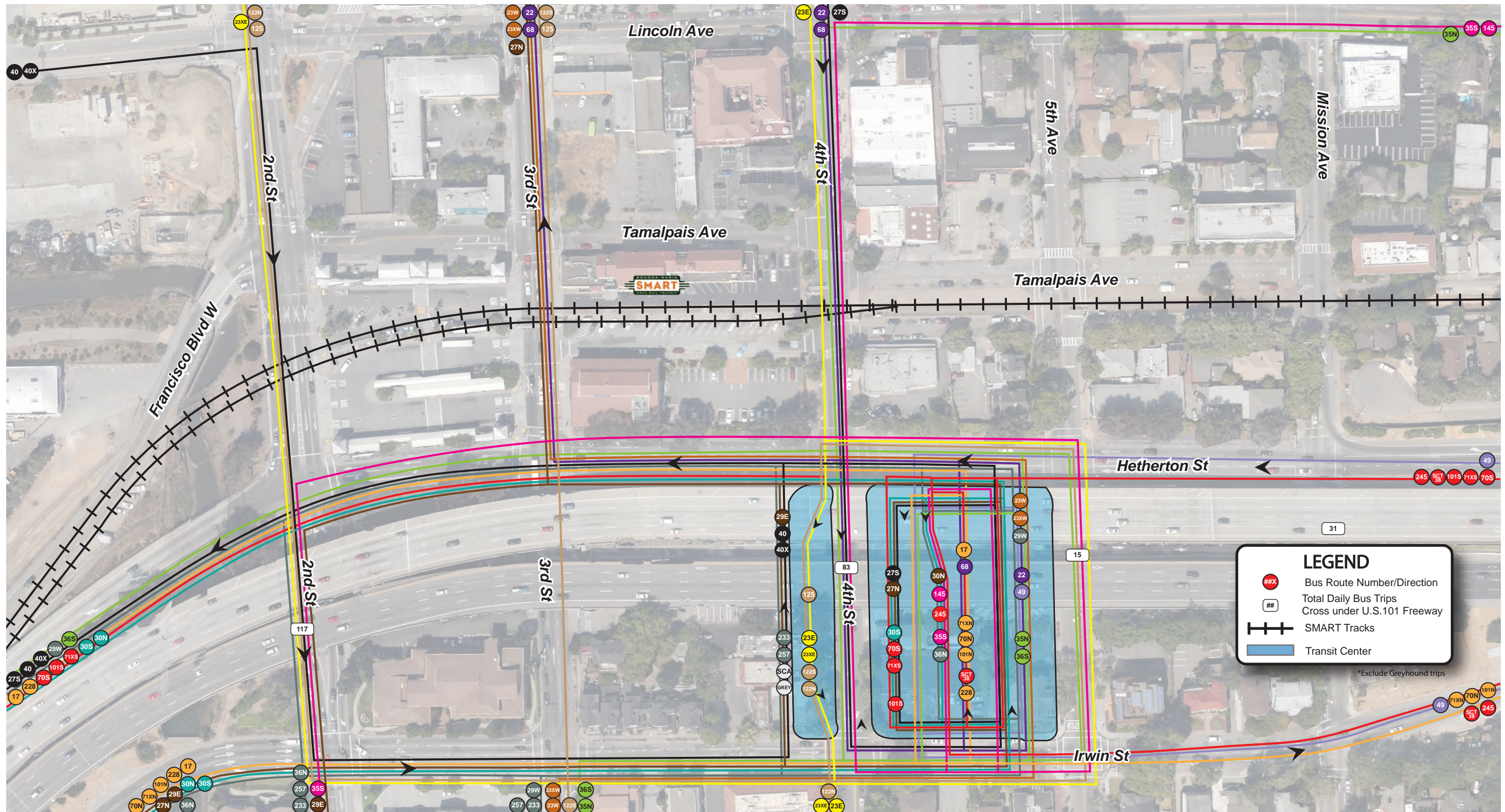


Figure 3-9: Under the Freeway - Existing Bus Routing

### Whistlestop Block Alternatives

A bay assignment and local routing scheme were developed for the Whistlestop Block Alternatives and are shown in Figure 3-10. Aside from these changes to route alignments, other factors affecting changes to bus circulation in this alternative include the redistribution of existing auto traffic on West Tamalpais Avenue and East Tamalpais Avenue between 3<sup>rd</sup> Street and 4<sup>th</sup> Street and the provision of a second southbound right-turn lane on Hetherton Street to 3<sup>rd</sup> Street. Transit circulation between the Whistlestop Block Alternatives would be comparable, as the variant does not affect bay assignment, transit routing, or background traffic circulation. The location of the bus bays, transit-only driveways, and pedestrian crosswalks are identical, other than the shifted location of the bus-only West Tamalpais Avenue, between the two Whistlestop Block Alternatives.

The total bus circulation times are shown in Table 3-5. More detailed results for the alternative can be found in Appendix A.

**Table 3-5: Whistlestop Block (Year 2020) – Total Transit Circulation Time in Network**

Scenario	Existing A.M.	Existing P.M.	Whistlestop Block A.M.	Whistlestop Block P.M.
Circulation Time	27,492 sec	25,739 sec	23,664 sec	21,583 sec
% Change from Baseline			-14%	-16%



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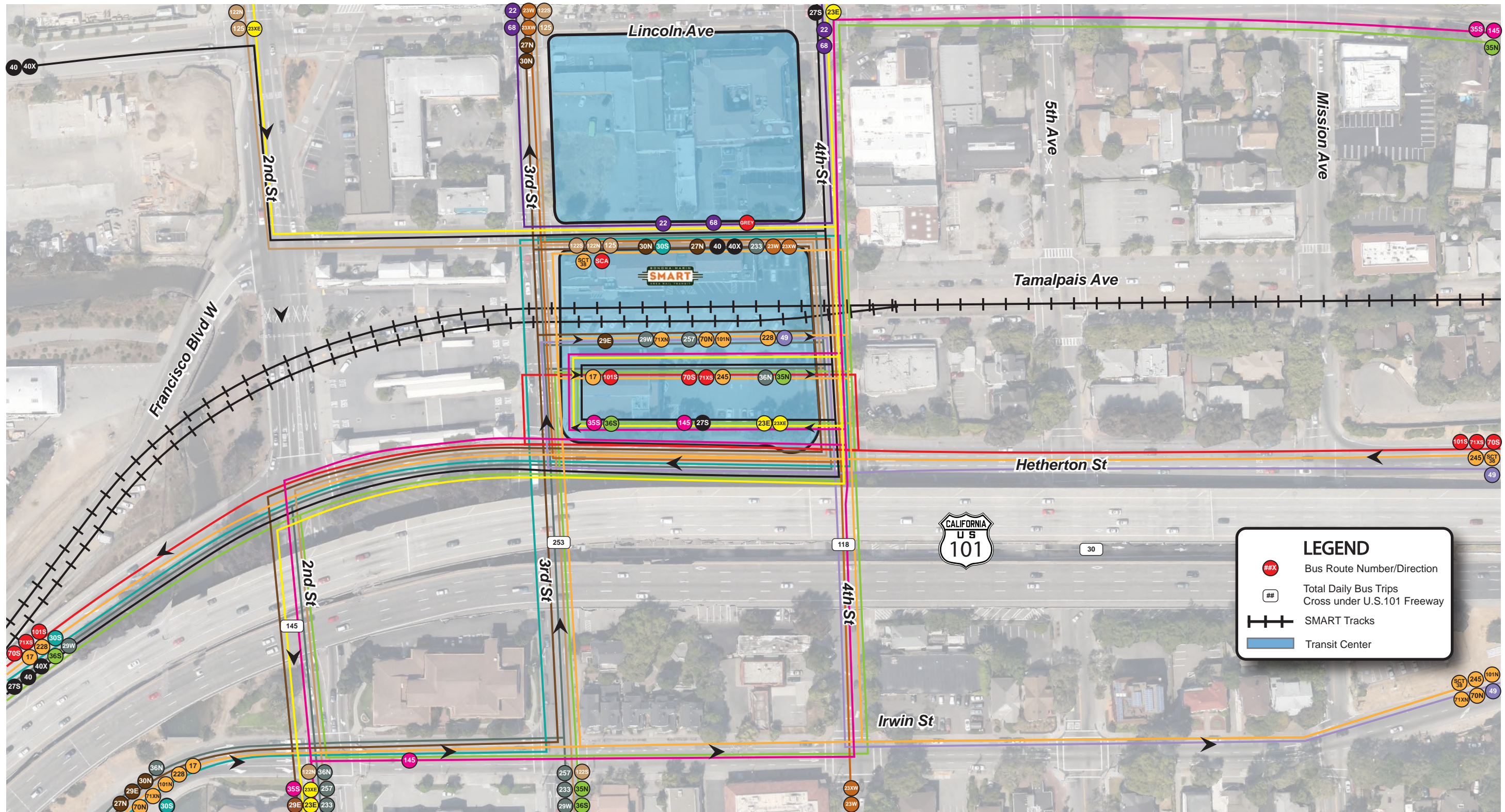


Figure 3-10: Whistlestop Block - Existing Bus Routing

### 3.4 Baseline Year 2040 Transit Service (No-Build Alternative)

No changes to transit service levels were assumed between existing and Year 2040 transit service for the baseline and No-Build Alternative. The only effects on bus circulation are planned changes to the roadway network (detailed in the Vehicular Traffic section), and the projected growth in traffic volumes throughout the network.

The total bus circulation times are shown in Table 3-6. More detailed results for the alternative can be found in Appendix A.

**Table 3-6: Year 2040 Baseline Conditions (No-Build) – Total Transit Circulation Time in Network**

Scenario	Existing A.M.	Existing P.M.	Year 2040 A.M.	Year 2040 P.M.
Circulation Time	27,492 sec	25,739 sec	34,808 sec	26,856 sec
% Change from Baseline			+27%	+4%

### 3.5 Year 2040 Transit Service – Build Alternatives

Similar to the Existing build alternatives, the primary change from the Year 2040 No-Build Alternative to the Year 2040 build alternatives is simply the rerouting of bus alignments to reach the new location of the transit center. They also reflect changes to pedestrian volumes and specific geometric modifications noted with each alternative. The assumed routing changes under Year 2040 conditions, and the measured effects on bus circulation, are detailed for each build alternative in their respective sections below.

#### 4<sup>th</sup> Street Gateway Alternative

A bay assignment and local routing scheme were developed for the 4<sup>th</sup> Street Gateway Alternative and are shown in Figure 3-11. The routing is similar to the Year 2020 routing, but with modifications to account for planned roadway network changes.

The total bus circulation times are shown in Table 3-7. In this scenario, a select number of individual model runs for the 4<sup>th</sup> Street Gateway Alternative resulted in network model gridlock due to extensive queueing at certain capacity-constrained locations spilling back and affecting upstream intersections. The a.m. model results reflect the gridlock caused in certain model runs that significantly affect the average results for this alternative. More detailed results for the alternative can be found in **Appendix A**.

**Table 3-7: 4<sup>th</sup> Street Gateway (Year 2040) – Total Transit Circulation Time in Network**

Scenario	Year 2040 A.M.	Year 2040 P.M.	Year 2040 4 <sup>th</sup> Street Gateway A.M.	Year 2040 4 <sup>th</sup> Street Gateway P.M.
Circulation Time	34,808 sec	26,856 sec	38,547 <sup>1</sup> sec	24,416 sec
% Change from Baseline			+11%	-9%

<sup>1</sup> Does not reflect model runs that were gridlocked and thus did not output results. Actual circulation time may be higher.



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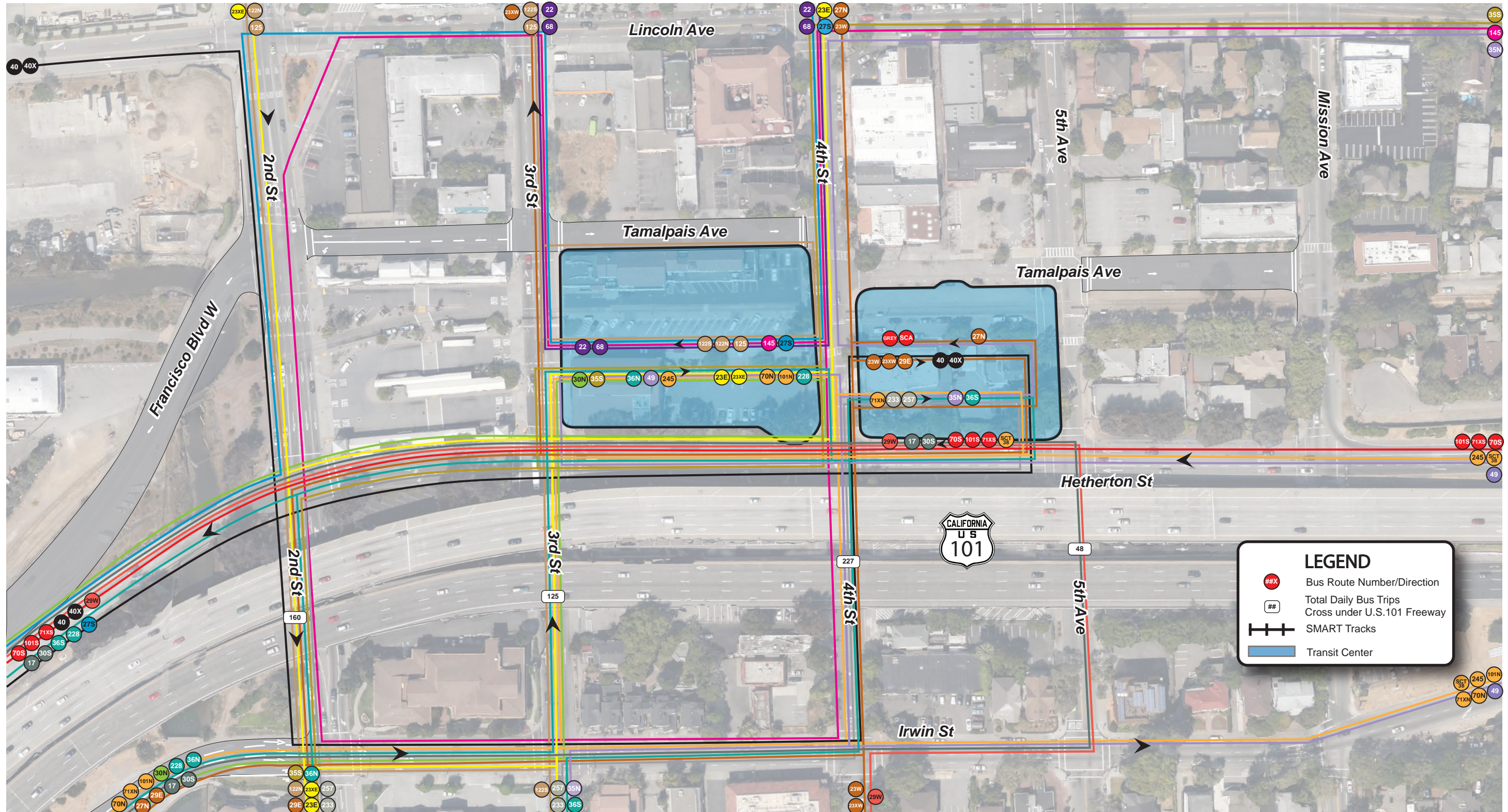


Figure 3-11: 4th Street Gateway - Year 2040 Bus Routing

### Under the Freeway Alternative

A bay assignment and local routing scheme were developed for the Under the Freeway Alternative and are shown in Figure 3-12. The routing is similar to the Year 2020 routing, but with modifications to account for planned roadway network changes.

The total bus circulation times are shown in Table 3-8. More detailed results for the alternative can be found in Appendix A.

**Table 3-8: Under the Freeway (Year 2040) – Total Transit Circulation Time in Network**

Scenario	Year 2040 A.M.	Year 2040 P.M.	Year 2040 Under the Freeway A.M.	Year 2040 Under the Freeway P.M.
Circulation Time	34,808 sec	26,856 sec	29,300 sec	27,740 sec
% Change from Baseline			-16%	+3%





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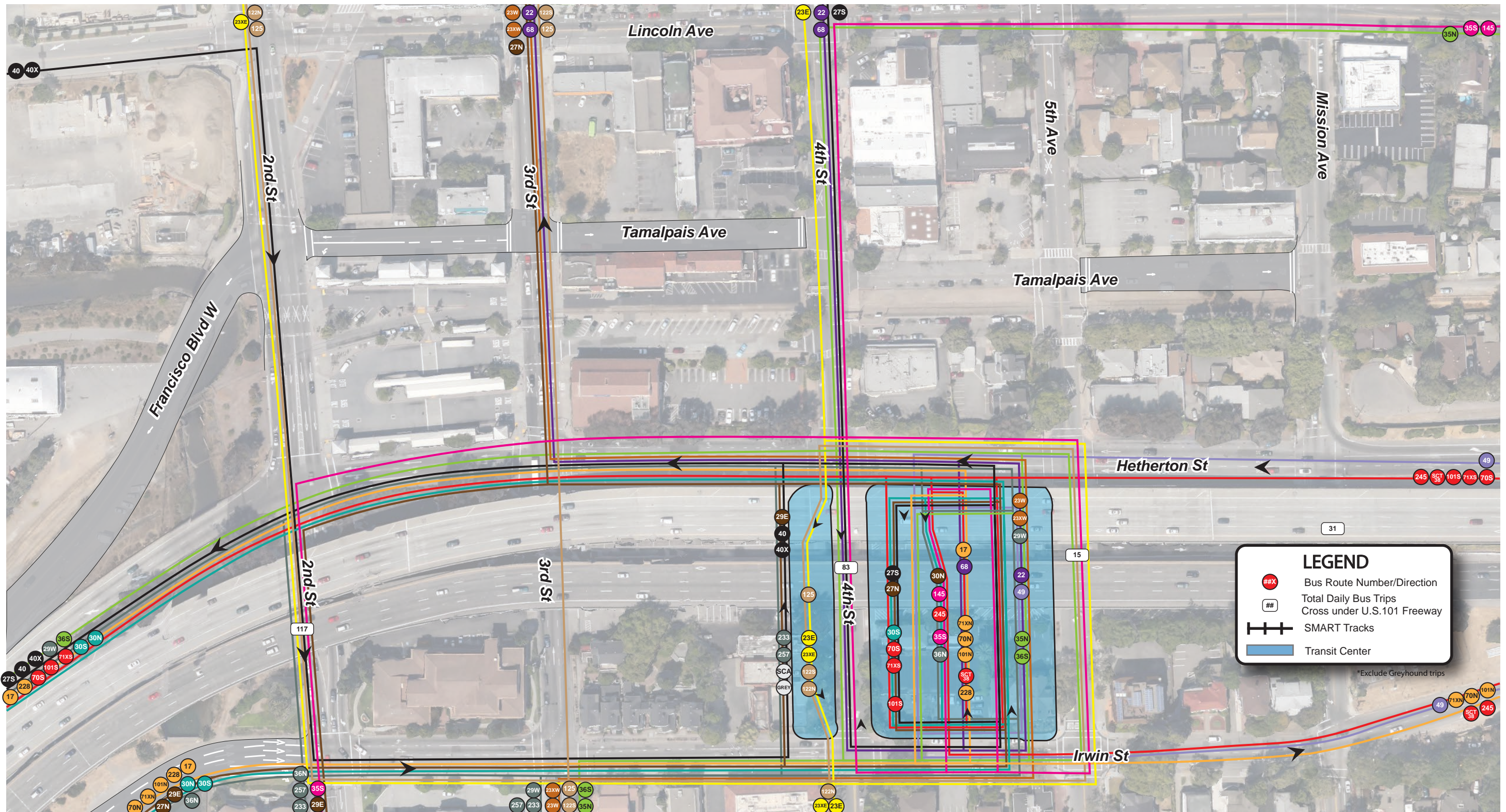


Figure 3-12: Under the Freeway - Year 2040 Bus Routing

### Whistlestop Block Alternatives

A bay assignment and local routing scheme were developed for the Whistlestop Block Alternatives under Year 2040 conditions and are shown in Figure 3-13. The routing is similar to the Year 2020 routing, but with modifications to account for planned roadway network changes. With these Alternatives, the planned modification of Tamalpais Avenue to be one-way between 2<sup>nd</sup> and 4<sup>th</sup> Streets and the closure of Tamalpais Avenue between 4<sup>th</sup> Street and Fifth Avenue would be precluded. Tamalpais Avenue would operate as bus-only between 3<sup>rd</sup> and 4<sup>th</sup> Streets and as two-way traffic between 2<sup>nd</sup> and 3<sup>rd</sup> Streets and 4<sup>th</sup> Street and Fifth Avenue.

The total bus circulation times are shown in Table 3-9. More detailed results for the alternative can be found in Appendix A.

**Table 3-9: Whistlestop Block (Year 2040) – Total Transit Circulation Time in Network**

Scenario	Year 2040 A.M.	Year 2040 P.M.	Year 2040 Whistlestop Block A.M.	Year 2040 Whistlestop Block P.M.
Circulation Time	34,808 sec	26,856 sec	27,386 sec	23,056 sec
% Change from Baseline			-21%	-14%



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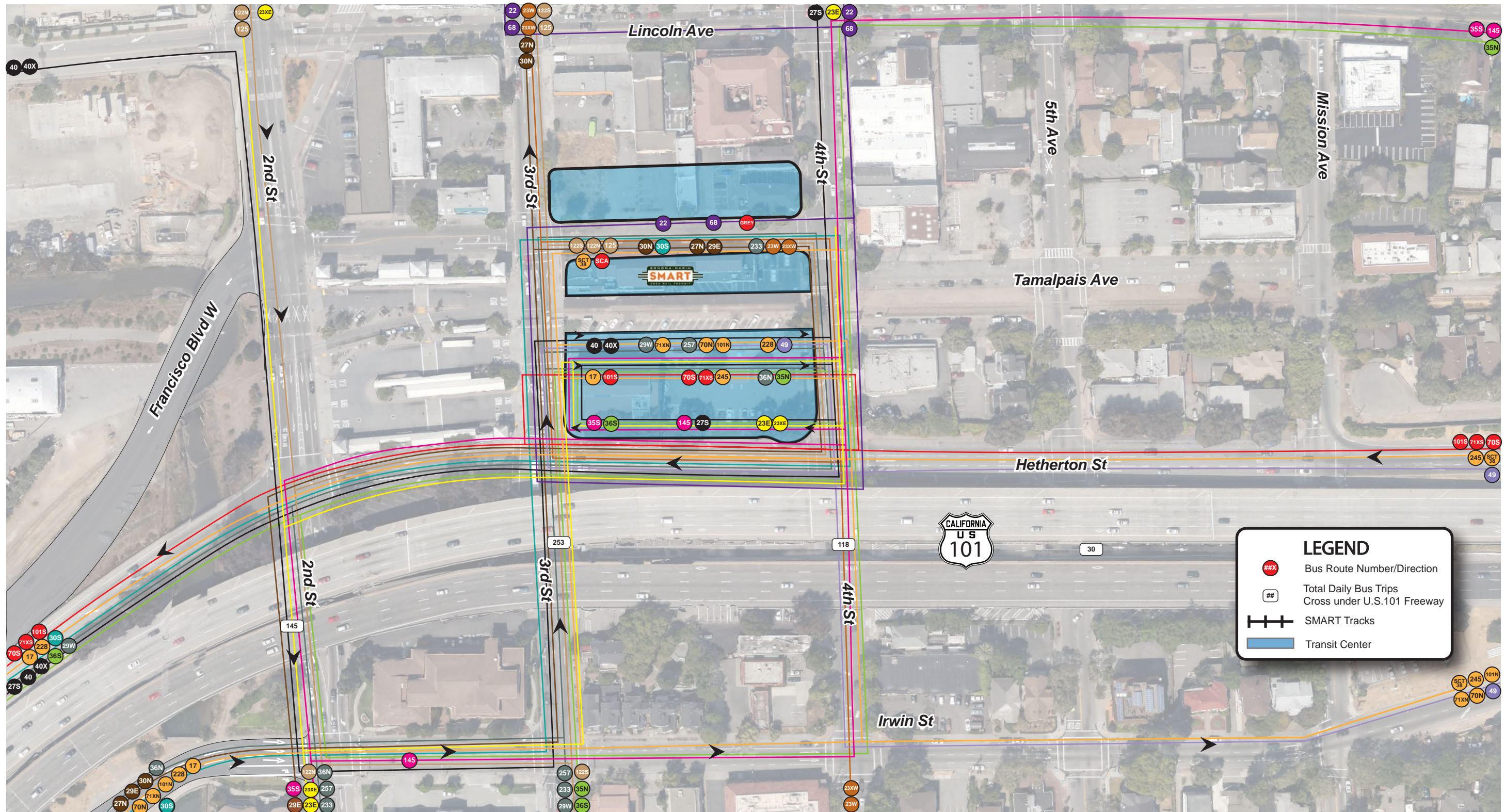


Figure 3-13: Whistlestop Block - Year 2040 Bus Routing

### 3.6 Transit Service – Bus Circulation Analysis Summary

A summary of the total circulation time by all routes for each alternative is presented in Table 3-10 for Existing (Year 2020) conditions and Table 3-11 for Year 2040 conditions. The percent change for delay for each Build alternative compared to the No-Build Alternative is also presented.

**Table 3-10: Total Circulation Time in Network – Existing (Year 2020) Conditions**

Total Circulation Time by Routes		% Change
No-Build A.M. Peak Hour	27,492 sec	
No-Build P.M. Peak Hour	25,739 sec	
4th Street Gateway A.M. Peak Hour	25,550 sec	-7%
4th Street Gateway P.M. Peak Hour	24,133 sec	-6%
Under the Freeway A.M. Peak Hour	21,863 sec	-20%
Under the Freeway P.M. Peak Hour	22,487 sec	-13%
Whistlestop Block A.M. Peak Hour	23,664 sec	-14%
Whistlestop Block P.M. Peak Hour	21,583 sec	-16%

As shown in the table, in Year 2020 conditions, all build alternatives would result in a reduction in total circulation time relative to the No-Build Alternative. The Under the Freeway Alternative results in twenty percent reduction in transit travel time in the a.m. peak hour. The Whistlestop Block Alternatives results in a greater than ten percent reduction in transit travel time in both peak hours.

**Table 3-11: Total Circulation Time in Network – Year 2040 Conditions**

Total Circulation Time by Routes (s)		% Change
No-Build A.M. Peak Hour	34,808 sec	
No-Build P.M. Peak Hour	26,856 sec	
4th Street Gateway A.M. Peak Hour	38,547 sec	+11%
4th Street Gateway P.M. Peak Hour	24,416 sec	-9%
Under the Freeway A.M. Peak Hour	29,300 sec	-16%
Under the Freeway P.M. Peak Hour	27,740 sec	+3%
Whistlestop Block A.M. Peak Hour	27,386 sec	-21%
Whistlestop Block P.M. Peak Hour	23,056 sec	-14%

As shown in the table, in Year 2040 conditions, the Whistlestop Block Alternatives provide a greater than 10 percent reduction in transit travel time in both the a.m. and p.m. peak hours relative to the No-Build Alternative. The Under Freeway Alternative results in a decrease in circulation time in the a.m. peak hour and a slight increase in circulation time in the p.m. peak hour. This increase is the result of routing additional buses through heavily constrained intersections on 4<sup>th</sup> Street.

## 4.0 Vehicular Traffic

This section presents results of an assessment of potential impacts of the relocation of SRTC on vehicular traffic in the study area.

### 4.1 Existing Conditions (No-Build Alternative)

Traffic volumes in the study area were obtained from traffic counts conducted for the project in 2020 prior to the COVID-19 pandemic impacts. The volumes for both Existing (Year 2020) conditions can be found in Appendix B. Geometrics reflect conditions as of January 2020.

The results of the existing baseline (No-Build Alternative) analysis are presented in Table 4-1 and Table 4-2.

**Table 4-1: Existing Baseline Conditions (No-Build) – Intersection Delay**

ID	Intersection	A.M. Peak Hour		P.M. Peak Hour	
		Average Delay (sec)	LOS	Average Delay (sec)	LOS
1	2nd & Hetherton	17.1	B	18.2	B
2	3rd & Hetherton	24.6	C	32.5	C
3	4th & Hetherton	21.8	C	39.0	D
4	Fifth & Hetherton	16.7	B	18.5	B
5	Mission & Hetherton	26.4	C	26.7	C
6	2nd & Irwin	20.5	C	67.0	E
7	3rd & Irwin	19.3	B	33.5	C
8	4th & Irwin	24.2	C	23.3	C
9	Fifth & Irwin	13.2	B	10.5	B
10	Mission & Irwin	20.9	C	23.9	C
11	2nd & Grand	26.9	C	27.3	C
12	3rd & Grand	19.2	B	37.8	D
13	4th & Grand	36.5	D	32.9	C
14	Fifth & Grand	5.1	A	14.5	B
15	Mission & Grand	20.5	C	24.7	C
16	2nd & Lincoln	40.0	D	64.6	E
17	3rd & Lincoln	19.8	B	10.0	B
18	4th & Lincoln	27.5	C	20.7	C
19	Fifth & Lincoln	33.5	C	16.6	B
20	Mission & Lincoln	36.5	D	22.3	C
21	2nd & A	13.1	B	25.2	C
22	3rd & A	15.8	B	16.3	B
23	4th & A	14.0	B	16.8	B
24	Fifth & A	19.2	C	22.1	C
25	2nd & Tamalpais	20.8	C	32.5	C
26	3rd & Tamalpais	12.9	B	16.8	B
27	2nd & Lindaro	24.3	C	70.0	E
28	3rd & Lindaro	9.3	A	6.4	A
29	4th & Cijos	10.3	B	11.4	B
30	4th & Lootens	10.2	B	14.8	B
31	Fifth & Court	29.4	C	27.9	C
32	Mission & Court	11.0	B	4.8	A
33	Fifth & Tamalpais	6.6	A	6.5	A
34	Fifth & E Tamalpais	5.4	A	4.7	A
35	3rd & Ritter	3.1	A	2.1	A
36	Ritter & Lincoln	15.2	C	8.3	A
37	Fifth & Nye	4.7	A	2.5	A
38	Mission & Nye	5.4	A	2.3	A
39	Mission & E Tamalpais	4.6	A	4.1	A
40	Mission & Tamalpais	6.8	A	4.3	A
41	4th & Tamalpais	14.9	B	26.0	C
42	4th & E Tamalpais	7.3	A	9.7	A

**Table 4-2: Existing Baseline Conditions (No-Build) – Corridor Travel Times**

Route	A.M. Peak Hour	P.M. Peak Hour
3rd Street – Grand to A	03:47	04:01
2nd Street – A to Grand	03:41	05:08
4th Street WB – Grand to A	03:56	05:05
4th Street EB – A to Grand	04:06	05:07
Irwin Street – 101 to Mission	02:17	03:34
Hetherton Street – 101 to 2nd	02:05	02:41

Travel times provided in minutes:seconds format

## 4.2 Existing Conditions – Build Alternatives

### 4<sup>th</sup> Street Gateway Alternative

The following roadway geometric changes were associated specifically with the 4<sup>th</sup> Street Gateway Alternative.

- Hetherton Street and 3<sup>rd</sup> Street – Includes a second southbound right-turn lane
- Hetherton Street and 4<sup>th</sup> Street – Eliminates southbound right-turn movements
- East Tamalpais Avenue between 3<sup>rd</sup> Street and 4<sup>th</sup> Street – Roadway eliminated
- East Tamalpais Avenue between 4<sup>th</sup> Street and Fifth Avenue – Roadway eliminated

The closure of East Tamalpais Avenue between 3<sup>rd</sup> Street and Fifth Avenue resulted in a redistribution of vehicles. Southbound right-turn movements from Hetherton Street to 4<sup>th</sup> Street were diverted to similar right-turn movements from Hetherton Street to 3<sup>rd</sup> Street or Hetherton Street to Fifth Avenue. The vehicles are assumed to return to 4<sup>th</sup> Street via Lincoln Avenue or A Street.

In the Year 2020 analysis, all other intersections reflect geometrics as of January 2020.

In addition, buses were re-routed to the proposed bays with this alternative. New driveways are provided to access the proposed transit center. The existing eastbound left-turn from 4<sup>th</sup> Street to Irwin Street was also assumed to be converted from a permissive to a protected and permissive left-turn phase.

Intersection LOS and corridor travel time with this alternative is shown in Table 4-3 and Table 4-4, respectively.

**Table 4-3: 4th Street Gateway (Year 2020) – Intersection Delay**

		Existing Baseline				4th Street Gateway			
		A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
ID	Intersection	Average Delay (sec)	LOS	Average Delay (sec)	LOS	Average Delay (sec)	LOS	Average Delay (sec)	LOS
1	2nd & Hetherton	17.1	B	18.2	B	19.5	B	17.4	B
2	3rd & Hetherton	24.6	C	32.5	C	29.9	C	34.5	C
3	4th & Hetherton	21.8	C	39.0	D	18.2	B	27.2	C
4	Fifth & Hetherton	16.7	B	18.5	B	22.2	C	14.6	B
5	Mission & Hetherton	26.4	C	26.7	C	31.7	C	26.8	C
6	2nd & Irwin	20.5	C	67.0	E	23.7	C	68.8	E
7	3rd & Irwin	19.3	B	33.5	C	21.4	C	32.9	C
8	4th & Irwin	24.2	C	23.3	C	23.5	C	15.7	B
9	Fifth & Irwin	13.2	B	10.5	B	14.0	B	11.0	B
10	Mission & Irwin	20.9	C	23.9	C	22.8	C	24.3	C
11	2nd & Grand	26.9	C	27.3	C	21.4	C	26.9	C
12	3rd & Grand	19.2	B	37.8	D	16.8	B	36.6	D
13	4th & Grand	36.5	D	32.9	C	27.4	C	29.8	C
14	Fifth & Grand	5.1	A	14.5	B	4.5	A	12.6	B
15	Mission & Grand	20.5	C	24.7	C	21.5	C	25.2	D
16	2nd & Lincoln	40.0	D	64.6	E	45.8	D	60.5	E
17	3rd & Lincoln	19.8	B	10.0	B	16.0	B	11.1	B
18	4th & Lincoln	27.5	C	20.7	C	26.9	C	14.3	B
19	Fifth & Lincoln	33.5	C	16.6	B	33.9	C	18.4	B
20	Mission & Lincoln	36.5	D	22.3	C	35.7	D	22.8	C
21	2nd & A	13.1	B	25.2	C	15.0	B	20.7	C
22	3rd & A	15.8	B	16.3	B	15.8	B	16.5	B
23	4th & A	14.0	B	16.8	B	12.5	B	14.8	B
24	Fifth & A	19.2	C	22.1	C	20.5	C	24.6	C
25	2nd & Tamalpais	20.8	C	32.5	C	22.8	C	31.6	C
26	3rd & Tamalpais	12.9	B	16.8	B	17.5	B	17.9	B
27	2nd & Lindaro	24.3	C	70.0	E	33.1	C	54.2	D
28	3rd & Lindaro	9.3	A	6.4	A	4.6	A	6.4	A
29	4th & Cijos	10.3	B	11.4	B	7.0	A	9.1	A
30	4th & Lootens	10.2	B	14.8	B	7.7	A	11.0	B
31	Fifth & Court	29.4	C	27.9	C	35.7	D	34.3	C
32	Mission & Court	11.0	B	4.8	A	14.2	B	7.3	A
33	Fifth & Tamalpais	6.6	A	6.5	A	6.2	A	5.5	A
34	Fifth & E Tamalpais	5.4	A	4.7	A	7.8	A	4.2	A
35	3rd & Ritter	3.1	A	2.1	A	1.3	A	2.2	A
36	Ritter & Lincoln	15.2	C	8.3	A	20.9	C	6.7	A
37	Fifth & Nye	4.7	A	2.5	A	3.8	A	4.2	A
38	Mission & Nye	5.4	A	2.3	A	7.5	A	3.1	A
39	Mission & E Tamalpais	4.6	A	4.1	A	5.5	A	3.9	A
40	Mission & Tamalpais	6.8	A	4.3	A	7.5	A	4.6	A
41	4th & Tamalpais	14.9	B	26.0	C	7.9	A	15.4	B
42	4th & E Tamalpais	7.3	A	9.7	A	2.4	A	3.0	A



As shown in the table, the 4<sup>th</sup> Street Gateway Alternative does not result in any additional intersections operating at LOS E or F. All intersections, except #6: 2<sup>nd</sup> Street and Irwin Street, operating at LOS E in the Existing Baseline scenario either improve in LOS or have a reduction in average delay.

**Table 4-4: 4th Street Gateway (Year 2020) – Corridor Travel Times**

Route	Existing Baseline		4 <sup>th</sup> Street Gateway		Change from Baseline	
	A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour
3rd Street – Grand to A	03:47	04:01	03:40	04:08	-00:07	+00:07
2nd Street – A to Grand	03:41	05:08	04:04	04:46	+00:23	-00:22
4th Street WB – Grand to A	03:56	05:05	03:23	04:28	-00:33	-00:37
4th Street EB – A to Grand	04:06	05:07	03:04	03:39	-01:02	-01:28
Irwin Street – 101 to Mission	02:17	03:34	02:29	03:27	+00:12	-00:07
Hetherton Street – 101 to 2nd	02:05	02:41	02:17	02:24	+00:12	-00:17

Travel times provided in minutes:seconds format

As shown in the table, the alternative results in improvement in travel time along 4<sup>th</sup> Street, with a mix of changes in travel time on other corridors.

### **Under the Freeway Alternative**

Buses were re-routed to the proposed bays with this alternative. New driveways are provided to access the proposed transit center. The eastbound left-turn from 4<sup>th</sup> Street to Irwin Street was also assumed to be converted from a permissive to a protected and permissive left-turn phase. This alternative does not include any other roadway geometry changes.

In the Year 2020 analysis, all intersections reflect geometrics as of January 2020. There were no roadway network changes associated with this alternative. Intersection LOS and corridor travel time with this alternative are shown in Table 4-5 and Table 4-6, respectively.

Table 4-5: Under the Freeway (Year 2020) – Intersection Delay

		Existing Baseline				Under the Freeway			
		A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
ID	Intersection	Average Delay (sec)	LOS	Average Delay (sec)	LOS	Average Delay (sec)	LOS	Average Delay (sec)	LOS
1	2nd & Hetherton	17.1	B	18.2	B	17.6	B	17.7	B
2	3rd & Hetherton	24.6	C	32.5	C	25.5	C	28.4	C
3	4th & Hetherton	21.8	C	39.0	D	20.9	C	30.1	C
4	Fifth & Hetherton	16.7	B	18.5	B	16.4	B	14.2	B
5	Mission & Hetherton	26.4	C	26.7	C	25.3	C	25.5	C
6	2nd & Irwin	20.5	C	67.0	E	19.0	B	60.6	E
7	3rd & Irwin	19.3	B	33.5	C	18.0	B	30.6	C
8	4th & Irwin	24.2	C	23.3	C	21.4	C	17.1	B
9	Fifth & Irwin	13.2	B	10.5	B	10.1	B	10.2	B
10	Mission & Irwin	20.9	C	23.9	C	22.7	C	24.1	C
11	2nd & Grand	26.9	C	27.3	C	23.5	C	25.2	C
12	3rd & Grand	19.2	B	37.8	D	18.0	B	35.9	D
13	4th & Grand	36.5	D	32.9	C	32.4	C	27.5	C
14	Fifth & Grand	5.1	A	14.5	B	5.1	A	13.0	B
15	Mission & Grand	20.5	C	24.7	C	24.6	C	24.0	C
16	2nd & Lincoln	40.0	D	64.6	E	38.9	D	62.6	E
17	3rd & Lincoln	19.8	B	10.0	B	16.2	B	10.3	B
18	4th & Lincoln	27.5	C	20.7	C	20.9	C	16.0	B
19	Fifth & Lincoln	33.5	C	16.6	B	30.3	C	16.3	B
20	Mission & Lincoln	36.5	D	22.3	C	27.6	C	22.6	C
21	2nd & A	13.1	B	25.2	C	13.0	B	22.7	C
22	3rd & A	15.8	B	16.3	B	15.9	B	16.7	B
23	4th & A	14.0	B	16.8	B	13.5	B	16.4	B
24	Fifth & A	19.2	C	22.1	C	19.0	C	25.0	C
25	2nd & Tamalpais	20.8	C	32.5	C	21.0	C	31.7	C
26	3rd & Tamalpais	12.9	B	16.8	B	15.3	B	16.7	B
27	2nd & Lindaro	24.3	C	70.0	E	26.4	C	61.4	E
28	3rd & Lindaro	9.3	A	6.4	A	4.8	A	6.4	A
29	4th & Cijos	10.3	B	11.4	B	4.8	A	5.5	A
30	4th & Lootens	10.2	B	14.8	B	6.8	A	12.5	B
31	Fifth & Court	29.4	C	27.9	C	27.6	C	29.2	C
32	Mission & Court	11.0	B	4.8	A	9.2	A	5.6	A
33	Fifth & Tamalpais	6.6	A	6.5	A	6.3	A	5.4	A
34	Fifth & E Tamalpais	5.4	A	4.7	A	4.8	A	4.6	A
35	3rd & Ritter	3.1	A	2.1	A	1.3	A	2.2	A
36	Ritter & Lincoln	15.2	C	8.3	A	24.3	C	7.6	A
37	Fifth & Nye	4.7	A	2.5	A	2.5	A	2.3	A
38	Mission & Nye	5.4	A	2.3	A	4.5	A	2.7	A
39	Mission & E Tamalpais	4.6	A	4.1	A	4.4	A	4.2	A
40	Mission & Tamalpais	6.8	A	4.3	A	6.3	A	4.6	A
41	4th & Tamalpais	14.9	B	26.0	C	8.0	A	19.0	B
42	4th & E Tamalpais	7.3	A	9.7	A	7.9	A	9.8	A

As shown in the table, the Under the Freeway Alternative does not result in any additional intersections operating at LOS E or F. All intersections operating at LOS E in the Existing Baseline scenario either improve in LOS or have a reduction in average delay.

**Table 4-6: Under the Freeway (Year 2020) – Corridor Travel Times**

Route	Existing Baseline		Under the Freeway		Change from Baseline	
	A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour
3rd Street – Grand to A	03:47	04:01	03:35	03:58	-00:12	-00:03
2nd Street – A to Grand	03:41	05:08	03:40	04:58	-00:01	-00:10
4th Street WB – Grand to A	03:56	05:05	03:44	04:53	-00:12	-00:12
4th Street EB – A to Grand	04:06	05:07	03:08	03:47	-00:58	-01:20
Irwin Street – 101 to Mission	02:17	03:34	02:13	03:23	-00:04	-00:11
Hetherton Street – 101 to 2nd	02:05	02:41	02:14	02:21	+00:09	-00:20

Travel times provided in minutes:seconds format

As shown in the table, the alternative results in improvement in travel time along all corridors in both peak periods.

### Whistlestop Block Alternatives

The following roadway geometric changes were associated specifically with the Whistlestop Block Alternatives.

- Hetherton Street and 3<sup>rd</sup> Street – Includes modifying an existing southbound through lane to a second exclusive southbound right lane and modifying signal phasing to eliminate conflicts between southbound right-turns and pedestrians
- East Tamalpais Avenue between 3<sup>rd</sup> Street and 4<sup>th</sup> Street – Removes roadway
- West Tamalpais Avenue between 3<sup>rd</sup> Street and 4<sup>th</sup> Street – Converts to bus-only for both northbound and southbound vehicles
- Add LPIs to all pedestrian movements at 4<sup>th</sup> Street and Hetherton Street intersection
- Vehicles on both East and West Tamalpais Avenue were re-routed to Lincoln Avenue

The Build (Year 2020) Whistlestop Block Alternatives model reflects recently implemented geometric improvements and signal timing changes in downtown San Rafael, as noted in section 2.3. These changes generally prioritize pedestrian and bicycle circulation to the detriment of auto circulation. Thus, the model shows a conservative effect of the project on auto circulation relative to existing conditions and some increases in delay are the result of already-implemented, non-Project modifications, not the project itself.

Buses were re-routed to the proposed bays with these alternatives. New driveways are provided to access the proposed transit center. The eastbound left-turn from 4<sup>th</sup> Street to Irwin Street was also assumed to be converted from a permissive to a protected and permissive left-turn phase.

Intersection LOS and corridor travel times with these alternatives are shown in Table 4-7 and Table 4-8, respectively.

Table 4-7: Whistlestop Block (Year 2020) – Intersection Delay

		Existing Baseline				Whistlestop Block			
		A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
ID	Intersection	Average Delay (sec)	LOS	Average Delay (sec)	LOS	Average Delay (sec)	LOS	Average Delay (sec)	LOS
1	2nd & Hetherton	17.1	B	18.2	B	16.7	B	20.0	C
2	3rd & Hetherton	24.6	C	32.5	C	25.8	C	32.3	C
3	4th & Hetherton	21.8	C	39.0	D	20.9	C	41.1	D
4	Fifth & Hetherton	16.7	B	18.5	B	16.7	B	13.2	B
5	Mission & Hetherton	26.4	C	26.7	C	27.5	C	25.4	C
6	2nd & Irwin	20.5	C	67.0	E	20.8	C	45.2	D
7	3rd & Irwin	19.3	B	33.5	C	16.4	B	27.2	C
8	4th & Irwin	24.2	C	23.3	C	23.1	C	26.8	C
9	Fifth & Irwin	13.2	B	10.5	B	9.4	A	10.4	B
10	Mission & Irwin	20.9	C	23.9	C	21.3	C	24.2	C
11	2nd & Grand	26.9	C	27.3	C	25.3	C	28.3	C
12	3rd & Grand	19.2	B	37.8	D	21.4	C	34.3	C
13	4th & Grand	36.5	D	32.9	C	43.7	D	35.7	D
14	Fifth & Grand	5.1	A	14.5	B	4.5	A	8.3	A
15	Mission & Grand	20.5	C	24.7	C	21.8	C	24.7	C
16	2nd & Lincoln	40.0	D	64.6	E	40.2	D	99.7	F
17	3rd & Lincoln	19.8	B	10.0	B	16.5	B	9.3	A
18	4th & Lincoln	27.5	C	20.7	C	27.2	C	15.0	B
19	Fifth & Lincoln	33.5	C	16.6	B	33.4	C	12.2	B
20	Mission & Lincoln	36.5	D	22.3	C	40.9	D	22.4	C
21	2nd & A	13.1	B	25.2	C	12.3	B	24.6	C
22	3rd & A	15.8	B	16.3	B	15.4	B	16.1	B
23	4th & A	14.0	B	16.8	B	14.4	B	15.5	B
24	Fifth & A	19.2	C	22.1	C	19.3	C	21.3	C
25	2nd & Tamalpais	20.8	C	32.5	C	18.6	B	27.1	C
26	3rd & Tamalpais	12.9	B	16.8	B	9.2	A	11.6	B
27	2nd & Lindaro	24.3	C	70.0	E	23.3	C	69.3	E
28	3rd & Lindaro	9.3	A	6.4	A	7.3	A	7.7	A
29	4th & Cijos	10.3	B	11.4	B	8.0	A	6.2	A
30	4th & Lootens	10.2	B	14.8	B	8.1	A	12.7	B
31	Fifth & Court	29.4	C	27.9	C	29.5	C	30.8	C
32	Mission & Court	11.0	B	4.8	A	12.3	B	5.8	A
33	Fifth & Tamalpais	6.6	A	6.5	A	6.8	A	5.4	A
34	Fifth & E Tamalpais	5.4	A	4.7	A	5.1	A	4.3	A
35	3rd & Ritter	3.1	A	2.1	A	2.2	A	3.2	A
36	Ritter & Lincoln	15.2	C	8.3	A	13.8	B	12.2	B
37	Fifth & Nye	4.7	A	2.5	A	6.3	A	3.1	A
38	Mission & Nye	5.4	A	2.3	A	6.7	A	2.9	A
39	Mission & E Tamalpais	4.6	A	4.1	A	4.9	A	4.2	A
40	Mission & Tamalpais	6.8	A	4.3	A	6.4	A	4.3	A
41	4th & Tamalpais	14.9	B	26.0	C	12.2	B	14.1	B
42	4th & E Tamalpais	7.3	A	9.7	A	6.9	A	13.3	B

As shown in the table, the Whistlestop Block Alternatives model indicates that one intersection, #16: 2<sup>nd</sup> Street and Lincoln Avenue, which operated at LOS E with Year 2020 No-Build conditions to degrade to LOS F during the p.m. peak. The Whistlestop Block Alternatives are not modifying traffic volumes, geometrics, or signal timing at this intersection. The increase in delay is associated with a redistribution of existing (Year 2020) conditions trips from Francisco Boulevard to Lincoln Avenue, an already-implemented, non-project activity. The redistribution of these trips was not reflected in the Year 2020 No-Build conditions model, nor the other two build alternatives Year 2020 models.

**Table 4-8: Whistlestop Block (Year 2020) – Corridor Travel Times**

Route	Existing Baseline		Whistlestop Block		Change from Baseline	
	A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour
3 <sup>rd</sup> Street – Grand to A	03:47	04:01	03:36	03:59	-00:11	-00:02
2 <sup>nd</sup> Street – A to Grand	03:41	05:08	03:30	05:17	-00:11	+00:09
4 <sup>th</sup> Street WB – Grand to A	03:56	05:05	03:52	05:57	-00:04	+00:52
4 <sup>th</sup> Street EB – A to Grand	04:06	05:07	03:23	04:05	-00:43	-01:02
Irwin Street – 101 to Mission	02:17	03:34	02:15	02:58	-00:02	-00:36
Hetherton Street – 101 to 2 <sup>nd</sup>	02:05	02:41	02:23	02:56	+00:18	+00:15

Travel times provided in minutes:seconds format

As shown in the table, the alternative results in improvement in travel time along most corridors.

### 4.3 Existing Conditions – Summary

In addition to intersection-level and corridor-level results, the VISSIM model was utilized to capture the network-wide effects of each alternative.

The overall network results for all alternatives are shown in Table 4-9.

**Table 4-9: Network Evaluation – Existing Conditions**

Scenario		Avg Delay/Vehicle	Avg # Stops/Vehicle	Net Change in Delay/Vehicle	Net Change in Delay/Vehicle (%)
Baseline (No-Build)	A.M. Peak Hour	175 sec	4		
	P.M. Peak Hour	123 sec	6		
4 <sup>th</sup> Street Gateway	A.M. Peak Hour	200 sec	4	+25	+15%
	P.M. Peak Hour	144 sec	6	+21	+12%
Under the Freeway	A.M. Peak Hour	170 sec	4	-5	-3%
	P.M. Peak Hour	115 sec	5	-8	-5%
Whistlestop Block	A.M. Peak Hour	175 sec	4	0	--
	P.M. Peak Hour	121 sec	5	-2	-1%

As shown in the table, the Under the Freeway Alternative achieves a small reduction in vehicle delay in both peak hours and the Whistlestop Block Alternatives result in minimal change. In both peak hours, the 4<sup>th</sup> Street Gateway Alternative results in an increase in vehicle delay.

#### **4.4 Baseline Year 2040 Conditions (No-Build Alternative)**

The Year 2040 baseline model includes the City of San Rafael's proposed future roadway network changes and future planned growth with the San Rafael General Plan Update. The modifications associated with Year 2040 conditions are described in Chapter 2.

In addition to the anticipated geometric changes, it was assumed that signalized intersections under future conditions would generally have the same signal timings as existing conditions. Leading pedestrian intervals and other changes in signal timing were incorporated where already implemented. Minor phase split timing changes were included at a limited number of locations where demand exceeded capacity with projected growth.

Appendix B includes the traffic volumes used in the Year 2040 baseline conditions analysis. Intersection level of service and corridor travel time with this alternative is shown in Table 4-10 and Table 4-11, respectively.

Table 4-10: Year 2040 Baseline Conditions (No-Build) – Intersection Delay

		Existing Baseline				Year 2040 Baseline			
		A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
ID	Intersection	Average Delay (sec)	LOS	Average Delay (sec)	LOS	Average Delay (sec)	LOS	Average Delay (sec)	LOS
1	2nd & Hetherton	17.1	B	18.2	B	22.4	C	22.9	C
2	3rd & Hetherton	24.6	C	32.5	C	34.2	C	32.2	C
3	4th & Hetherton	21.8	C	39.0	D	44.1	D	40.3	D
4	Fifth & Hetherton	16.7	B	18.5	B	25.1	C	18.6	B
5	Mission & Hetherton	26.4	C	26.7	C	50.7	D	41.1	D
6	2nd & Irwin	20.5	C	67.0	E	60.8	E	97.0	F
7	3rd & Irwin	19.3	B	33.5	C	24.4	C	23.9	C
8	4th & Irwin	24.2	C	23.3	C	60.0	E	23.1	C
9	Fifth & Irwin	13.2	B	10.5	B	18.3	B	16.1	B
10	Mission & Irwin	20.9	C	23.9	C	33.6	C	27.0	C
11	2nd & Grand	26.9	C	27.3	C	79.8	E	33.5	C
12	3rd & Grand	19.2	B	37.8	D	76.6	E	26.4	C
13	4th & Grand	36.5	D	32.9	C	172.2	F	35.0	D
14	Fifth & Grand	5.1	A	14.5	B	62.6	F	20.8	C
15	Mission & Grand	20.5	C	24.7	C	94.2	F	34.5	D
16	2nd & Lincoln	40.0	D	64.6	E	83.7	F	115.7	F
17	3rd & Lincoln	19.8	B	10.0	B	16.1	B	9.5	A
18	4th & Lincoln	27.5	C	20.7	C	42.1	D	16.8	B
19	Fifth & Lincoln	33.5	C	16.6	B	58.3	E	15.0	B
20	Mission & Lincoln	36.5	D	22.3	C	107.5	F	32.8	C
21	2nd & A	13.1	B	25.2	C	47.8	D	43.8	D
22	3rd & A	15.8	B	16.3	B	18.9	B	16.0	B
23	4th & A	14.0	B	16.8	B	30.8	C	18.4	B
24	Fifth & A	19.2	C	22.1	C	36.7	E	41.6	E
25	2nd & Tamalpais	20.8	C	32.5	C	28.6	C	33.3	C
26	3rd & Tamalpais	12.9	B	16.8	B	11.7	B	15.1	B
27	2nd & Lindaro	24.3	C	70.0	E	125.9	F	142.3	F
28	3rd & Lindaro	9.3	A	6.4	A	6.7	A	8.1	A
29	4th & Cijos	10.3	B	11.4	B	34.7	D	7.2	A
30	4th & Lootens	10.2	B	14.8	B	42.6	D	13.4	B
31	Fifth & Court	29.4	C	27.9	C	38.8	D	50.2	D
32	Mission & Court	11.0	B	4.8	A	21.8	C	23.9	C
33	Fifth & Tamalpais	6.6	A	6.5	A	10.0	A	8.0	A
34	Fifth & E Tamalpais	5.4	A	4.7	A	8.2	A	5.8	A
35	3rd & Ritter	3.1	A	2.1	A	1.8	A	3.7	A
36	Ritter & Lincoln	15.2	C	8.3	A	16.7	C	17.3	C
37	Fifth & Nye	4.7	A	2.5	A	28.2	D	8.6	A
38	Mission & Nye	5.4	A	2.3	A	10.0	B	10.1	B
39	Mission & E Tamalpais	4.6	A	4.1	A	6.9	A	6.4	A
40	Mission & Tamalpais	6.8	A	4.3	A	11.5	B	7.6	A
41	4th & Tamalpais	14.9	B	26.0	C	31.6	C	17.6	B
42	4th & E Tamalpais	7.3	A	9.7	A	16.3	B	8.0	A

**Table 4-11: Year 2040 Baseline Conditions (No-Build) – Corridor Travel Times**

Route	Existing Baseline		2040 Baseline	
	A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour
3rd Street – Grand to A	03:47	04:01	03:36	04:00
2nd Street – A to Grand	03:41	05:08	06:56	07:10
4th Street WB – Grand to A	03:56	05:05	07:52	04:38
4th Street EB – A to Grand	04:06	05:07	07:19	04:41
Irwin Street – 101 to Mission	02:17	03:34	03:33	04:32
Hetherton Street – 101 to 2nd	02:05	02:41	03:18	03:15

Travel times provided in minutes:seconds format

## 4.5 Year 2040 Conditions – Build Alternatives

### 4<sup>th</sup> Street Gateway Alternative

The same alternative-specific roadway network changes that were described in the existing conditions section were applied to the future conditions model.

Due to the growth in traffic volume and the geometric changes associated with the alternative, several of the individual model runs resulted in gridlock, particularly in the a.m. peak period, resulting in very poor traffic network performance. Gridlock formed in the network in the “box” of intersections formed by Irwin Street, Lincoln Avenue, 4<sup>th</sup> Street, and Fifth Avenue. The left-turning vehicles would begin queueing and back into the downstream intersections. Eventually, this would result in the other approaches backing up as well and since there is a grid network, this effect slowly propagated through the rest of the network, resulting in gridlock.

The results provided in Table 4-12 and Table 4-13 reflect intersection delay and corridor travel times, respectively. The deterioration in LOS at several intersections in the a.m. peak hour reflects the overall network gridlock observed.



Table 4-12: 4th Street Gateway (Year 2040) – Intersection Delay

		Year 2040 Baseline				4th Street Gateway			
		A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
ID	Intersection	Average Delay (sec)	LOS	Average Delay (sec)	LOS	Average Delay (sec)	LOS	Average Delay (sec)	LOS
1	2nd & Hetherton	22.4	C	22.9	C	27.3	C	18.8	B
2	3rd & Hetherton	34.2	C	32.2	C	39.6	D	35.2	D
3	4th & Hetherton	44.1	D	40.3	D	40.2	D	21.0	C
4	Fifth & Hetherton	25.1	C	18.6	B	57.0	E	17.7	B
5	Mission & Hetherton	50.7	D	41.1	D	101.3	F	54.7	D
6	2nd & Irwin	60.8	E	97.0	F	70.7	E	66.7	E
7	3rd & Irwin	24.4	C	23.9	C	34.8	C	37.5	D
8	4th & Irwin	60.0	E	23.1	C	74.1	E	20.6	C
9	Fifth & Irwin	18.3	B	16.1	B	47.5	D	23.0	C
10	Mission & Irwin	33.6	C	27.0	C	43.3	D	32.1	C
11	2nd & Grand	79.8	E	33.5	C	67.1	E	28.9	C
12	3rd & Grand	76.6	E	26.4	C	53.9	D	26.3	C
13	4th & Grand	172.2	F	35.0	D	141.2	F	34.0	C
14	Fifth & Grand	62.6	F	20.8	C	43.8	E	19.8	C
15	Mission & Grand	94.2	F	34.5	D	64.9	F	39.1	E
16	2nd & Lincoln	83.7	F	115.7	F	123.5	F	103.2	F
17	3rd & Lincoln	16.1	B	9.5	A	21.3	C	11.5	B
18	4th & Lincoln	42.1	D	16.8	B	53.7	D	14.2	B
19	Fifth & Lincoln	58.3	E	15.0	B	71.5	E	21.7	C
20	Mission & Lincoln	107.5	F	32.8	C	140.3	F	46.0	D
21	2nd & A	47.8	D	43.8	D	61.7	E	37.3	D
22	3rd & A	18.9	B	16.0	B	17.4	B	16.3	B
23	4th & A	30.8	C	18.4	B	41.7	D	17.8	B
24	Fifth & A	36.7	E	41.6	E	43.3	E	47.4	E
25	2nd & Tamalpais	28.6	C	33.3	C	36.3	D	30.2	C
26	3rd & Tamalpais	11.7	B	15.1	B	17.4	B	19.2	B
27	2nd & Lindaro	125.9	F	142.3	F	158.7	F	127.4	F
28	3rd & Lindaro	6.7	A	8.1	A	6.2	A	7.8	A
29	4th & Cijos	34.7	D	7.2	A	38.9	E	11.0	B
30	4th & Lootens	42.6	D	13.4	B	53.7	D	12.5	B
31	Fifth & Court	38.8	D	50.2	D	47.7	D	63.3	E
32	Mission & Court	21.8	C	23.9	C	57.2	F	30.0	D
33	Fifth & Tamalpais	10.0	A	8.0	A	15.4	B	10.3	B
34	Fifth & E Tamalpais	8.2	A	5.8	A	19.0	B	5.8	A
35	3rd & Ritter	1.8	A	3.7	A	2.0	A	3.4	A
36	Ritter & Lincoln	16.7	C	17.3	C	16.2	C	11.5	B
37	Fifth & Nye	28.2	D	8.6	A	26.3	D	24.6	C
38	Mission & Nye	10.0	B	10.1	B	27.3	D	14.0	B
39	Mission & E Tamalpais	6.9	A	6.4	A	11.0	B	8.0	A
40	Mission & Tamalpais	11.5	B	7.6	A	29.7	C	7.5	A
41	4th & Tamalpais	31.6	C	17.6	B	37.6	D	20.2	C
42	4th & E Tamalpais	16.3	B	8.0	A	7.6	A	5.7	A

As shown in the table, all intersections operating at LOS E or LOS F either improve in LOS or have a reduction in average delay, except for #6: 2<sup>nd</sup> Street and Irwin Street, #8: 4<sup>th</sup> Street and Irwin Street, #16: 2<sup>nd</sup> Street and Lincoln Avenue, #19: Fifth Avenue and Lincoln Avenue, #20: Mission Avenue and Lincoln Avenue, #24: Fifth Avenue and A Street, and #27: 2<sup>nd</sup> Street and Lindaro St. There are other locations that see a deterioration in level of service to LOS E or F, including #4: Fifth Avenue and Hetherton Street, #5: Mission Avenue and Hetherton Street, #15: Mission Avenue and Grand Avenue, #21: 2<sup>nd</sup> Street and A Street, #29: 4<sup>th</sup> Street and Cijos Street, #31: Fifth Avenue and Court Street, and #32: Mission Avenue and Court Street.

**Table 4-13: 4th Street Gateway (Year 2040) – Corridor Travel Times**

Route	2040 Baseline		4 <sup>th</sup> Street Gateway		Change from Baseline	
	A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour
3rd Street – Grand to A	03:36	04:00	03:47	04:14	+00:11	+00:14
2nd Street – A to Grand	06:56	07:10	08:04	06:17	+01:08	-00:53
4th Street WB – Grand to A	07:52	04:38	05:50	04:38	-02:02	00:00
4th Street EB – A to Grand	07:19	04:41	08:54	03:48	+01:35	-00:53
Irwin Street – 101 to Mission	03:33	04:32	05:05	03:56	+01:32	-00:36
Hetherton Street – 101 to 2nd	03:18	03:15	04:34	02:32	+01:16	-00:43

Travel times provided in minutes:seconds format

As shown in the table, in the a.m. peak hour, there is a large increase in travel times along several corridors. In the p.m. peak hour, the alternative generally results in a decrease in travel times along several corridors.

### **Under the Freeway Alternative**

The Under the Freeway Alternative does not require any roadway network changes, other than driveway access to the transit center itself. Intersection LOS and corridor travel time with this alternative is shown in Table 4-14 and Table 4-15, respectively.

Table 4-14: Under the Freeway (Year 2040) – Intersection Delay

		Year 2040 Baseline				Under the Freeway			
		A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
ID	Intersection	Average Delay (sec)	LOS	Average Delay (sec)	LOS	Average Delay (sec)	LOS	Average Delay (sec)	LOS
1	2nd & Hetherton	22.4	C	22.9	C	20.3	C	17.8	B
2	3rd & Hetherton	34.2	C	32.2	C	28.9	C	38.0	D
3	4th & Hetherton	44.1	D	40.3	D	37.5	D	51.1	D
4	Fifth & Hetherton	25.1	C	18.6	B	21.6	C	42.4	D
5	Mission & Hetherton	50.7	D	41.1	D	51.7	D	55.1	E
6	2nd & Irwin	60.8	E	97.0	F	43.1	D	64.3	E
7	3rd & Irwin	24.4	C	23.9	C	24.2	C	35.7	D
8	4th & Irwin	60.0	E	23.1	C	57.8	E	27.5	C
9	Fifth & Irwin	18.3	B	16.1	B	16.2	B	20.3	C
10	Mission & Irwin	33.6	C	27.0	C	30.3	C	27.9	C
11	2nd & Grand	79.8	E	33.5	C	83.1	F	29.2	C
12	3rd & Grand	76.6	E	26.4	C	77.6	E	27.7	C
13	4th & Grand	172.2	F	35.0	D	173.1	F	41.1	D
14	Fifth & Grand	62.6	F	20.8	C	64.9	F	22.6	C
15	Mission & Grand	94.2	F	34.5	D	91.6	F	33.4	D
16	2nd & Lincoln	83.7	F	115.7	F	79.0	E	97.5	F
17	3rd & Lincoln	16.1	B	9.5	A	15.4	B	10.3	B
18	4th & Lincoln	42.1	D	16.8	B	31.2	C	16.9	B
19	Fifth & Lincoln	58.3	E	15.0	B	40.3	D	21.5	C
20	Mission & Lincoln	107.5	F	32.8	C	100.8	F	32.3	C
21	2nd & A	47.8	D	43.8	D	46.1	D	31.8	C
22	3rd & A	18.9	B	16.0	B	17.0	B	15.9	B
23	4th & A	30.8	C	18.4	B	16.4	B	18.1	B
24	Fifth & A	36.7	E	41.6	E	28.4	D	42.5	E
25	2nd & Tamalpais	28.6	C	33.3	C	28.3	C	29.4	C
26	3rd & Tamalpais	11.7	B	15.1	B	13.2	B	17.4	B
27	2nd & Lindaro	125.9	F	142.3	F	119.9	F	113.3	F
28	3rd & Lindaro	6.7	A	8.1	A	6.8	A	8.3	A
29	4th & Cijos	34.7	D	7.2	A	16.2	C	9.6	A
30	4th & Lootens	42.6	D	13.4	B	14.8	B	16.1	B
31	Fifth & Court	38.8	D	50.2	D	41.2	D	47.7	D
32	Mission & Court	21.8	C	23.9	C	27.8	D	23.5	C
33	Fifth & Tamalpais	10.0	A	8.0	A	8.3	A	16.1	B
34	Fifth & E Tamalpais	8.2	A	5.8	A	5.1	A	7.6	A
35	3rd & Ritter	1.8	A	3.7	A	2.2	A	3.5	A
36	Ritter & Lincoln	16.7	C	17.3	C	17.1	C	12.9	B
37	Fifth & Nye	28.2	D	8.6	A	10.3	B	13.3	B
38	Mission & Nye	10.0	B	10.1	B	14.0	B	8.3	A
39	Mission & E Tamalpais	6.9	A	6.4	A	8.0	A	5.7	A
40	Mission & Tamalpais	11.5	B	7.6	A	11.3	B	6.6	A
41	4th & Tamalpais	31.6	C	17.6	B	20.1	C	20.7	C
42	4th & E Tamalpais	16.3	B	8.0	A	10.8	B	8.2	A

As shown in the table, all intersections operating at LOS E or LOS F either improve in LOS or have a reduction in average delay, except for #11: 2<sup>nd</sup> Street and Grand Avenue, #12: 3<sup>rd</sup> Street and Irwin Street, #13: 4<sup>th</sup> Street and Grand Avenue, and #14: Fifth Avenue and Grand Avenue. There is one intersection, #5: Mission Avenue and Hetherton Street, that sees a deterioration in level of service to LOS E or F.

**Table 4-15: Under the Freeway (Year 2040) – Corridor Travel Times**

Route	2040 Baseline		Under the Freeway		Change from Baseline	
	A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour
3 <sup>rd</sup> Street – Grand to A	03:36	04:00	03:36	04:08	00:00	+00:08
2 <sup>nd</sup> Street – A to Grand	06:56	07:10	06:43	05:52	-00:13	-01:18
4 <sup>th</sup> Street WB – Grand to A	07:52	04:38	07:55	05:31	+00:03	+00:53
4 <sup>th</sup> Street EB – A to Grand	07:19	04:41	04:44	04:16	-02:35	-00:25
Irwin Street – 101 to Mission	03:33	04:32	03:12	03:50	-00:21	-00:42
Hetherton Street – 101 to 2 <sup>nd</sup>	03:18	03:15	02:56	04:13	-00:22	+00:58

Travel times provided in minutes:seconds format

As shown in the table, in the a.m. peak hour, there is a decrease in travel times along several corridors. In the p.m. peak hour, there is a mix of increases and decreases in travel times along the corridors.

### **Whistlestop Block Alternatives**

The same alternative-specific roadway network changes that were described in the existing conditions section were applied to the future conditions model. In Year 2040 conditions, the planned modifications to West Tamalpais Avenue included in the baseline scenario are not included with these alternatives. West Tamalpais Avenue would remain open to two-way traffic between 2<sup>nd</sup> and 3<sup>rd</sup> Streets, bus traffic between 3<sup>rd</sup> and 4<sup>th</sup> Streets, and two-way traffic between 4<sup>th</sup> Street and Fifth Avenue.

Intersection LOS and corridor travel time with these alternatives are shown in Table 4-16 and Table 4-17, respectively.

Table 4-16: Whistlestop Block (Year 2040) – Intersection Delay

		Year 2040 Baseline				Whistlestop Block			
		A.M. Peak Hour		P.M. Peak Hour		A.M. Peak Hour		P.M. Peak Hour	
ID	Intersection	Average Delay (sec)	LOS	Average Delay (sec)	LOS	Average Delay (sec)	LOS	Average Delay (sec)	LOS
1	2nd & Hetherton	22.4	C	22.9	C	21.6	C	18.9	B
2	3rd & Hetherton	34.2	C	32.2	C	28.9	C	32.1	C
3	4th & Hetherton	44.1	D	40.3	D	27.7	C	31.8	C
4	Fifth & Hetherton	25.1	C	18.6	B	17.3	B	14.3	B
5	Mission & Hetherton	50.7	D	41.1	D	46.9	D	41.5	D
6	2nd & Irwin	60.8	E	97.0	F	46.0	D	89.9	F
7	3rd & Irwin	24.4	C	23.9	C	21.6	C	25.1	C
8	4th & Irwin	60.0	E	23.1	C	43.8	D	26.8	C
9	Fifth & Irwin	18.3	B	16.1	B	14.2	B	16.1	B
10	Mission & Irwin	33.6	C	27.0	C	31.3	C	30.4	C
11	2nd & Grand	79.8	E	33.5	C	79.1	E	33.4	C
12	3rd & Grand	76.6	E	26.4	C	57.7	E	30.1	C
13	4th & Grand	172.2	F	35.0	D	131.8	F	46.5	D
14	Fifth & Grand	62.6	F	20.8	C	38.9	E	32.1	D
15	Mission & Grand	94.2	F	34.5	D	58.2	F	43.8	E
16	2nd & Lincoln	83.7	F	115.7	F	77.1	E	99.1	F
17	3rd & Lincoln	16.1	B	9.5	A	19.2	B	9.5	A
18	4th & Lincoln	42.1	D	16.8	B	32.5	C	13.8	B
19	Fifth & Lincoln	58.3	E	15.0	B	40.9	D	15.0	B
20	Mission & Lincoln	107.5	F	32.8	C	95.7	F	35.4	D
21	2nd & A	47.8	D	43.8	D	44.3	D	34.2	C
22	3rd & A	18.9	B	16.0	B	16.7	B	16.1	B
23	4th & A	30.8	C	18.4	B	15.6	B	15.8	B
24	Fifth & A	36.7	E	41.6	E	27.8	D	41.6	E
25	2nd & Tamalpais	28.6	C	33.3	C	27.9	C	28.5	C
26	3rd & Tamalpais	11.7	B	15.1	B	10.5	B	12.1	B
27	2nd & Lindaro	125.9	F	142.3	F	110.4	F	117.6	F
28	3rd & Lindaro	6.7	A	8.1	A	8.3	A	8.2	A
29	4th & Cijos	34.7	D	7.2	A	12.7	B	7.0	A
30	4th & Lootens	42.6	D	13.4	B	11.1	B	13.9	B
31	Fifth & Court	38.8	D	50.2	D	39.0	D	50.2	D
32	Mission & Court	21.8	C	23.9	C	21.7	C	23.6	C
33	Fifth & Tamalpais	10.0	A	8.0	A	7.8	A	7.9	A
34	Fifth & E Tamalpais	8.2	A	5.8	A	6.1	A	5.8	A
35	3rd & Ritter	1.8	A	3.7	A	3.3	A	3.6	A
36	Ritter & Lincoln	16.7	C	17.3	C	13.7	B	13.1	B
37	Fifth & Nye	28.2	D	8.6	A	12.1	B	10.4	B
38	Mission & Nye	10.0	B	10.1	B	12.2	B	9.3	A
39	Mission & E Tamalpais	6.9	A	6.4	A	7.2	A	6.2	A
40	Mission & Tamalpais	11.5	B	7.6	A	9.8	A	6.8	A
41	4th & Tamalpais	31.6	C	17.6	B	14.3	B	17.7	B
42	4th & E Tamalpais	16.3	B	8.0	A	7.2	A	10.0	A

As shown in the table, all intersections operating at LOS E or LOS F either improve in LOS or have a reduction in average delay. Only one location, intersection #15: Mission Avenue and Grand Avenue, deteriorates in level of service from LOS D to LOS E.

**Table 4-17: Whistlestop Block (Year 2040) – Corridor Travel Times**

Route	2040 Baseline		Whistlestop Block		Change from Baseline	
	A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour
3rd Street – Grand to A	03:36	04:00	03:42	03:59	+00:06	-00:01
2nd Street – A to Grand	06:56	07:10	06:34	06:04	-00:22	-01:06
4th Street WB – Grand to A	07:52	04:38	06:16	05:04	-01:36	+00:26
4th Street EB – A to Grand	07:19	04:41	03:46	04:09	-03:33	-00:32
Irwin Street – 101 to Mission	03:33	04:32	03:04	04:28	-00:29	-00:04
Hetherton Street – 101 to 2nd	03:18	03:15	02:39	03:02	-00:39	-00:13

Travel times provided in minutes:seconds format

As shown in the table, most corridors experience a decrease in travel time, with some of the decreases being substantial.

#### 4.6 Year 2040 Conditions – Summary

The overall network results for all alternatives are shown in Table 4-18.

**Table 4-18: Network Evaluation – Year 2040 Conditions**

Scenario		Avg Delay/Vehicle	Avg # Stops/Vehicle	Net Change in Delay/Vehicle	Net Change in Delay/ Vehicle (%)
Baseline (No-Build)	A.M. Peak Hour	276 sec	6		
	P.M. Peak Hour	156 sec	8		
4th Street Gateway	A.M. Peak Hour	313 sec	7	+37	+13%
	P.M. Peak Hour	155 sec	7	-1	-1%
Under the Freeway	A.M. Peak Hour	314 sec	6	+38	+14%
	P.M. Peak Hour	153 sec	6	-3	-2%
Whistlestop Block	A.M. Peak Hour	248 sec	6	-28	-10%
	P.M. Peak Hour	151 sec	8	-5	-3%

Both peak hours see a decrease in delay per vehicle with the Whistlestop Block Alternatives. Both the 4<sup>th</sup> Street Gateway and Under the Freeway Alternatives are shown to cause a greater than 10% increase in delay in the a.m. peak hour.

## 5.0 Non-Motorized Transportation

### 5.1 Pedestrian Conditions

#### Existing Conditions

The transit center is located within Downtown San Rafael, which has high levels of pedestrian activity. The 4<sup>th</sup> Street corridor represents the primary commercial corridor in downtown, with several businesses and shopping destinations, particularly west of Lincoln Avenue. Other important generators of pedestrian activity in the area include San Rafael High School (located on the north side of 3<sup>rd</sup> Street east of US 101) and the BioMarin campus at the southwest corner of Lincoln Avenue and 2<sup>nd</sup> Street.

Most roadways in the project vicinity, with the exception of portions of the south side of 2<sup>nd</sup> Street and the east side of Hetherton Street, include sidewalks. Crosswalks are provided at nearly all legs of each intersection, except for certain locations along 2<sup>nd</sup> Street and 3<sup>rd</sup> Street. The crosswalk across the south leg of the Hetherton Street and 3<sup>rd</sup> Street intersection was recently removed by the City of San Rafael (subsequent to data collection in January 2020) and replaced by a new crosswalk across the east leg of the same intersection. Signalized crosswalks are currently provided across both 4<sup>th</sup> Street and Fifth Avenue at each of West and East Tamalpais Avenue.

Intersection pedestrian counts were collected in January 2020 at the project study intersections during the morning (7 a.m. to 9 a.m.) and evening (4 p.m. to 6 p.m.) peak periods concurrent with the vehicle data collection. Peak-hour pedestrian volumes are summarized by leg in Appendix C.

#### Year 2040 Conditions and Build Alternatives

In the Year 2040 baseline scenario, one planned pedestrian network change was assumed: relocation of the existing crosswalks on the east and north legs of the 2<sup>nd</sup> Street and Irwin Street intersection to the south and west legs. This would be in conjunction with the construction of a new sidewalk on the south side of 2<sup>nd</sup> Street.

In the build alternatives, the baseline pedestrian volumes were modified to account for the shifting of pedestrian movements resulting from the relocation of the transit center. The estimated pedestrian movements were shifted based on existing pedestrian volumes and ridership data and the location of bays in each alternative.

Year 2040 pedestrian volumes were developed by applying the quadrant-level growth rates (described in the methodology section) to the existing intersection-level pedestrian volumes. The Year 2040 projected baseline peak-hour crosswalk volumes are summarized by leg in Appendix C.

## 5.2 Pedestrian Connectivity to Downtown

To evaluate the connectivity of the No-Build and four build alternatives to downtown, the project team evaluated the pedestrian routes between Downtown San Rafael and the transit center. The team then estimated walk times and utilized existing vehicle volumes to determine the number of conflicting vehicles encountered by pedestrians on their route between the transit center and downtown. For the purposes of this analysis, the pedestrian routes to downtown were represented with a point selected at the intersection of 4<sup>th</sup> Street and A Street.

### **No-Build Alternative/Existing Transit Center Site**

The No-Build Alternative would result in no significant changes to current pedestrian and bicycle infrastructure around the transit center. The existing deficiencies of pedestrian and bicycle access, circulation, and safety around the transit center and identified in the Draft Environmental Impact Report would remain. Pedestrian access to the transit center bus services requires pedestrians to walk along or cross 2<sup>nd</sup> or 3<sup>rd</sup> Street, which are the two highest volume streets in Downtown San Rafael. All passengers transferring to SMART must cross 3<sup>rd</sup> Street, and many of the transit center's passengers transferring between bus routes— which are nearly half of bus boardings—must cross the SMART tracks that run through the middle of the site. 3<sup>rd</sup> Street intersections with West Tamalpais Avenue and Hetherton Street have two of the three highest number of pedestrian-involved collisions in the study area between January 2015 and September 2021, representing a major barrier to transit center access.

To evaluate the No-Build Alternative's connectivity to nearby downtown destinations, the estimated walking time, and the number of conflicting vehicles that pedestrians would encounter along each path, were estimated. The pedestrian paths evaluate include the following:

- *Pedestrian Route 1:* This is the nearest path to downtown, which starts on the northwest corner of the station, along Tamalpais Avenue. This route is a 12.6-minute walk (0.38 miles).
- *Pedestrian Route 2:* This is the farthest path to downtown from existing southeast corner of the station, along Hetherton Street. This route is a 14.6-minute walk (0.45 miles).

For both of the above route options, the total conflicting vehicle movements depending on the peak hour are between 2,304 to 2,703 vehicles, as shown in Figure 5-1.





# SAN RAFAEL TRANSPORTATION CENTER

Relocation Analysis, Environmental Clearance, and Preliminary Design

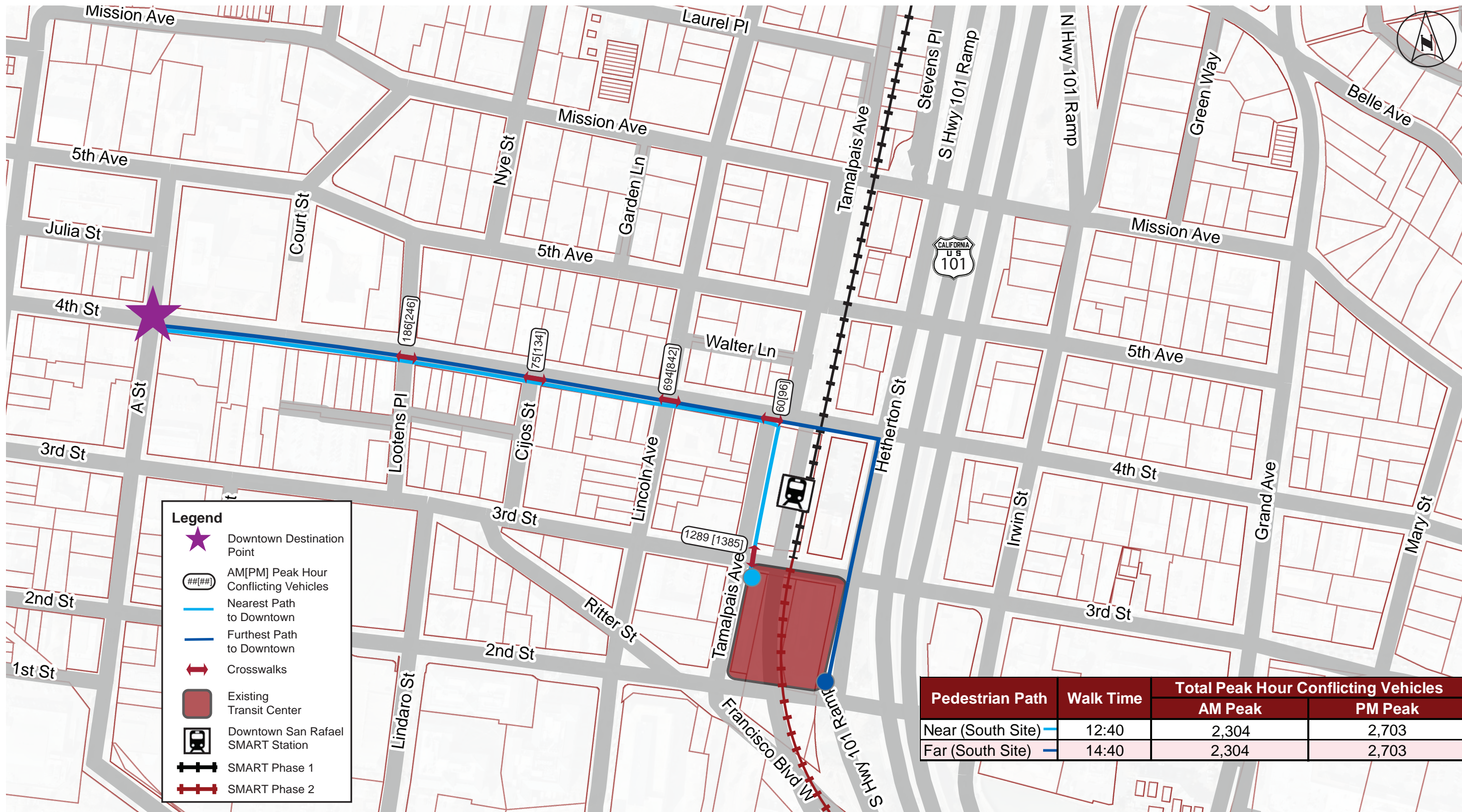


Figure 5-1: No-Build Alternative - Pedestrian Connectivity to Downtown

## 4<sup>th</sup> Street Gateway Alternative

Four pedestrian routes to downtown were identified for this alternative; routes were identified between both sides of the transit center on either side of 4<sup>th</sup> Street. For each side of the transit center, a “long” and “short” route was also identified. The long route is the route taken by pedestrians from the bay farthest from the downtown destination, while the short route is the closest. The routes identified are shown in Figure 5-2. Compared to other alternatives, the 4<sup>th</sup> Street Gateway Alternative has the least number of conflicting vehicles due to it being closer to downtown. For the north side of the transit center, pedestrian routes include the following:

- *Pedestrian Route 1:* This is the nearest path to downtown, which starts at the southwest corner of the north side of the transit center and follows along the north side of 4<sup>th</sup> Street. This route is a 10.2-minute walk (0.33 miles).
- *Pedestrian Route 2:* This is the farthest path to Downtown from Hetheron Street, coming from the northeast corner of the north side of the transit center and following along the north side of 4<sup>th</sup> Street. This route is a 11.5-minute walk (0.38 miles).

For both of the above route options, the total conflicting vehicle volume on 4<sup>th</sup> Street (from the three-cross streets of Tamalpais Avenue, Lincoln Avenue, and Lootens Place) during the a.m. peak hour is 897 vehicles and during the p.m. peak hour is 1,205 vehicles.

For the south side of the transit center, pedestrian routes include:

- *Pedestrian Route 3:* This is the nearest path to downtown from the northwest corner of the south side of the transit center and along the south side of 4<sup>th</sup> Street. This option is a 10.7-minute walk (0.32 miles).
- *Pedestrian Route 4:* This is the farthest path to downtown from Hetheron Street, east of the transit center and along the south side of 4<sup>th</sup> Street. This option is a 12.2-minute walk (0.38 miles).

For the above route options, the total conflicting vehicle volume along 4<sup>th</sup> Street (from the four cross streets of Tamalpais Avenue, Lincoln Avenue, Cijos Street, and Lootens Place) during the a.m. peak hour is 1,015 vehicles and during the p.m. peak hour is 1,318 vehicles.