

Table 2 summarizes the 46 pedestrian and bicycling collisions by severity from January 2015 to September 2021 for intersections in the vicinity of the Project alternatives.

Table 2: Pedestrian- and Bicycle-Involved Injury Collisions by Severity

Intersection	Complaint of Pain	Other Visible Injury	Severe Injury	Fatal	Total
2nd & Tamalpais		1		1	2
2nd & Hetherton		3			3
3rd & Tamalpais	2	8			10
3rd & Hetherton	4	3		1	8
3rd & Irwin	1	3			4
4th & Tamalpais	1	1			2
4th & Hetherton	3				3
4th & Irwin	2	7	1		10
5th & Tamalpais		1			1
5th & Hetherton					0
5th & Irwin		3			3
Total	13	30	1	2	46

Data Source: City of San Rafael, January 2015 to September 2021

The following summarizes findings for key intersections:

- **3rd Street & Hetherton Street**
 - This intersection is immediately adjacent to the existing SRTC and has the third highest number of existing pedestrian movements.
 - As noted earlier, the crosswalk on the south leg was removed and replaced with a new crosswalk on the east leg in 2020 because of safety concerns.
 - It can be challenging to identify the specific cause and location of collisions from these records because the collision location is not precisely identified. The one fatality recorded at this location, on June 8, 2016, occurred in the south crosswalk when a vehicle making a left-turn hit the pedestrian in the crosswalk when the pedestrian had the right-of-way. That crosswalk has since been removed.
 - Most of the other pedestrian injury collisions occurred with pedestrians in the crosswalk and the right-of-way and were struck by vehicles making a westbound left-turn in the south crosswalk (crosswalk has since been removed) or a southbound right-turn in the west crosswalk.
 - The number of collisions decreased significantly in 2020 compared to the previous five years. The removal of the south crosswalk in 2020 may have been one factor, along with a steep decrease in traffic and pedestrian volumes associated with the COVID-19 pandemic. There were no pedestrian- or bicycle-involved collisions in 2020 or the first 9 months of 2021.
- **3rd Street & Tamalpais Avenue**
 - Located immediately adjacent to the existing SRTC and has the highest number of existing pedestrian movements

- Tied for the most pedestrian and bicycle collisions.
- The majority of the collisions involved pedestrians who were in the crosswalk and had the right-of-way
- Nine of the ten collisions involved a car making a left-turn from Tamalpais to westbound 3rd Street
- In a few cases, pedestrians were at fault because they did not cross at a crosswalk or the automobile had the right-of-way
- **4th Street & Irwin Street**
 - Notable in that it did not among the higher number of pedestrian volumes within the study area and thus experiences a disproportionate amount of collisions relative to pedestrian volumes.
 - Tied for the most pedestrian and bicycle collisions.
 - The majority of the collisions involved pedestrians who were in the crosswalk and had the right-of-way
- **2nd Street & Tamalpais Avenue**
 - Pedestrian fatality occurred on 2nd Street just to the east of this intersection; however, the pedestrian was not crossing at the crosswalk and did not have the right-of-way

The City also provided the overall collision rates for intersections in Downtown San Rafael. **Table 3** summarizes the collision rate calculations based on vehicle volumes for a six-year period from September 1, 2015 to August 31, 2021. This analysis indicates that the intersections around the SRTC Project study area in Downtown San Rafael have collision rates higher than statewide averages.

Table 4 provides pedestrian- and bicycle-involved collision rates for the study intersections. These collision rates divide the number of pedestrian- and bicycle-involved collisions by the PM peak hour crosswalk volumes shown in Table 1. These rates are not traditional collision rate calculations but are used to assess how the frequency of pedestrian- and bicycle-involved collisions relate to the levels of pedestrian activity at each intersection.

The pedestrian and bicycle collision rates indicate that 4th Street & Irwin Street (0.24) has more than double the number of pedestrian- and bicycle-involved collisions relative to the amount of pedestrian activity of any other location in the study area. It is followed by 2nd Street & Hetherton Street (0.10) and 5th Avenue & Irwin Street (0.09). This indicates that these intersections are currently the most hazardous for pedestrians and bicyclists.

The pedestrian and bicycle collision history within the study area and the collision rates summarized highlight the need for the Project to fully consider safety for pedestrians and bicyclists accessing the station and transferring between transit modes.

Table 3: City of San Rafael's Collision Rate Calculations near the SRTC

Intersection	ADT ¹	# of Collisions 9/1/2016 - 8/31/2021	Total Collision Rate ²	Avg Statewide Collision Rate ³
2nd & Lincoln	36,595	36	0.45	0.24
2nd & Tamalpais - Francisco W	32,108	35	0.50	0.24
2nd & Hetherton	39,434	36	0.42	0.24
2nd & Irwin	38,900	48	0.56	0.24
2nd & Grand	29,881	34	0.52	0.24
3rd & Lincoln	26,555	33	0.57	0.24
3rd & Tamalpais	21,909	29	0.60	0.24
3rd & Hetherton	33,362	54	0.74	0.24
3rd & Irwin	38,101	29	0.35	0.24
3rd & Grand	25,283	59	1.07	0.24
4th & Lincoln	15,323	28	0.83	0.24
4th & Tamalpais	8,150	6	0.34	0.24
4th & Hetherton	20,017	35	0.80	0.24
4th & Irwin	22,231	25	0.51	0.24
4th & Grand	13,478	15	0.51	0.24

Notes:

1. Average daily traffic, provided by the City of San Rafael

2. Collision rates represent collisions per million entering vehicles using the following formula: $R = \frac{1,000,000 \times C}{365 \times N \times V}$

R = Collision rate for the intersection expressed as collisions per million entering vehicles

C = Total number of collisions near the study intersection during the study period. Fatal and injury (complaint of pain, other visible injury, and severe injury collisions) were evaluated in this analysis.

N = Number of years of data which equates to 6 years

V = Traffic volumes entering the intersection daily.

3. 2018 Crash Data on California State Highways (Caltrans, October 2018), page 86, "Urban, Signals" intersection category.

Source: City of San Rafael, 2022

Table 4: Pedestrian- and Bicycle-Involved Collision Rates

Intersection	# of Pedestrian & Bicycle Collisions ¹	PM Peak Hour Pedestrian Volumes ²	Pedestrian & Bicycle Collision Rate ³
2nd & Tamalpais	2	200	0.01
2nd & Hetherton	3	29	0.10
3rd & Tamalpais	10	349	0.03
3rd & Hetherton	8	157	0.05
3rd & Irwin	4	128	0.03
4th & Tamalpais	2	169	0.01
4th & Hetherton	3	118	0.03
4th & Irwin	10	42	0.24
5th & Tamalpais	1	48	0.02
5th & Hetherton	0	38	0.00
5th & Irwin	3	32	0.09
Total Pedestrian & Bicycle Collisions	46	200	0.01

Notes:

1. Pedestrian and bicycle collisions for January 2015 to September 2021
 2. January 2020 PM peak hour pedestrian volumes for all intersection crosswalks
 3. Collision rate calculated as the total number of pedestrian and bicycle collisions divided by the PM peak hour pedestrian volume
- Data Source: City of San Rafael (collision data), Kimley-Horn (count data and collision rate)

Planned Safety Improvements Across All Build Alternatives

Each of the Project Build alternatives include a series of safety-related improvements around the relocated SRTC. These improvements can be assessed using crash modification factors (CMF) for “countermeasures” published by the Federal Highway Administration’s (FHWA) *Crash Modification Clearinghouse* (website: <http://www.cmfclearinghouse.org/>) and Caltrans’ *Local Roadway Safety Manual (LRSM)*, *A Manual for California’s Local Road Owners, Version 1.5* (Caltrans, April 2020). These sources report CMFs for specific countermeasures, which indicate how the countermeasure would reduce the collision rate.

The following is a summary of the planned improvements and their potential benefits to transportation safety and mobility in the study area. If available, specific CMF IDs and collision reduction factors are reported.

- **Sidewalk Improvements** – Sidewalk improvements are incorporated into each of the Project alternatives, including sidewalk widening, where applicable, on Project blocks. The Project is currently planned to provide a 10 foot sidewalk width on sidewalks along Project blocks.
- **Install High-Visibility Crosswalks** – These are proposed for crosswalks on all Project-adjacent blocks in each Project alternative. The FHWA (CMF ID 4123) indicates a 40% reduction in vehicle-pedestrian crashes. Some intersections are already equipped with high-visibility crosswalks, but this improvement is applicable for several Project-adjacent intersections such as 3rd Street & Tamalpais Avenue, 4th Street & Tamalpais Avenue, and 4th Street & Hetherton Street.

- **Install Accessible Pedestrian Signal (APS)**– These improvements are proposed for signalized pedestrian crossings at Project-adjacent intersections under all Project alternatives where not already implemented.
- **Install Leading Pedestrian Interval (LPI) Signal Phasing** – LPIs are proposed for Project-adjacent signalized intersections where pedestrian conflicts exist and where they are not currently implemented, such as 4th Street & Hetherton Street. The FHWA (CMF IDs 1993, 9901, 9903, 9908, and several others) and Caltrans LSRM (S21PB) identify a number of studies that indicate up to 60% reduction in pedestrian crashes and up to 30% for all crashes.
- **Install Intersection Lighting** – Intersection lighting improvements are proposed for all Project alternatives at Project-adjacent locations where no lighting existed previously. The FHWA (CMF 4462 and 10993) and Caltrans LSRM (NS01) indicate a reduction in total nighttime crashes of up to 40%.

Project Alternatives Pedestrian Crossing Considerations

One of the primary goals of the Project is to provide improved pedestrian and bicycling access to SMART, GGT, and MT service at the SRTC, as well as provide convenient transfers between transit modes. The following is a summary of the planned safety-related improvements and modifications specific to each Project alternative. The findings from the pedestrian route analysis from the Transportation Summary Report have been incorporated into each Project alternative. The analysis evaluated walk times and the number of conflicting vehicle movements encountered from each alternative to three locations:

- **Downtown:** 4th Street & A Street
- **San Rafael High School:** the front of the school on 3rd Street between Union Street and Embarcadero Way
- **BioMarin campus:** a point on the campus fronting 2nd Street between Lincoln Avenue and Lindaro Street

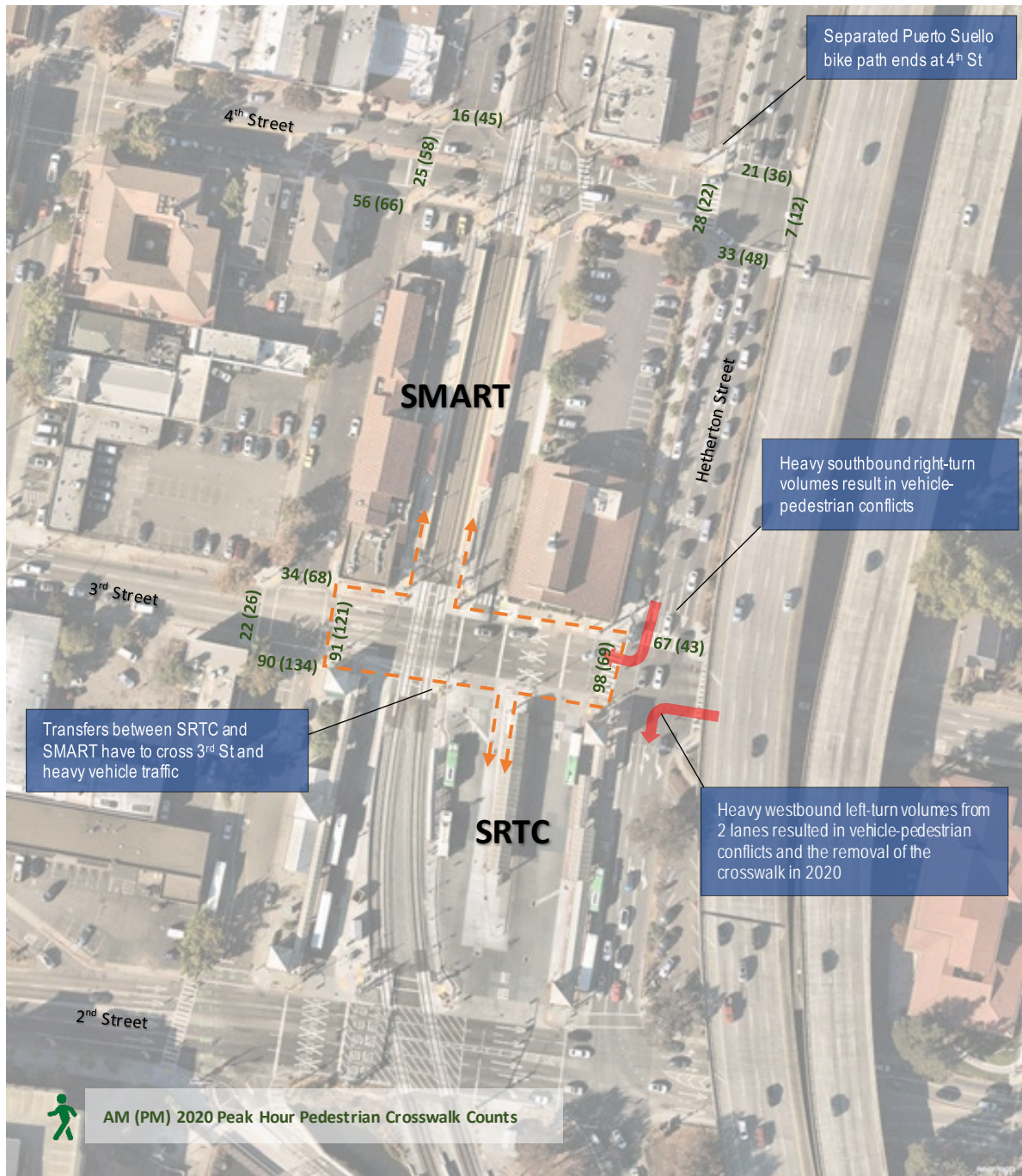
It is noted that relative walk times and conflicting vehicle movements between alternatives will remain consistent to other destinations in the vicinity of the three specific locations noted above. For example, the relative performance of each of the alternatives to Davidson Middle School would be the same as to BioMarin since the path of travel from each of the station alternatives to each of these two destinations would be identical outside of the immediate station alternative area.

For each alternative except the No Build, the walk times and conflicting volumes in the AM and PM peak hour are shown. The pedestrian connection analysis from the Transportation Summary Report is attached to this memorandum and summarized below.

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 SRTC. **Figure 4** shows the existing SRTC, SMART station, and pedestrian crosswalk volumes at major crossings on 3rd and 4th Streets.

Figure 4: Existing SRTC-Area Circulation



The existing deficiencies of pedestrian and bicycle access, circulation, and safety around the SRTC and identified in the EIR would remain. Pedestrian access to the SRTC bus services requires pedestrians to walk along or cross 2nd or 3rd Street, which are the two highest volume streets in downtown. All passengers transferring to SMART have to cross 3rd Street, and many of the SRTC's passengers transferring between bus routes, which are nearly half of bus boardings, have to cross the SMART tracks

that run through the middle of the site. 3rd Street intersections with Tamalpais Avenue and Hetherton Street have two of the three highest number of pedestrian-involved collisions in the study area during the analysis period, representing a major barrier to transit center access.

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

Figure 5 shows the pedestrian connectivity analysis to/from Downtown for two points for the No-Build Alternative. The walk trip to 4th Street & A Street is approximately 13 to 15 minutes, with 2,300 to 2,700 conflicting vehicle movements depending on the peak hour.

Figure 6 presents the pedestrian connectivity analysis from the No-Build Alternative to San Rafael High School and BioMarin's campus. The walk trip to San Rafael High School takes 18 to 20 minutes with 4,700 to 5,160 vehicle conflicts depending on the peak hour. The walk trip to BioMarin takes 5.5 to 7.5 minutes with 2,700 to 3,050 vehicle conflicts.

The pedestrian connectivity analysis is conducted for each of the SRTC alternatives described in the following sections.

Figure 5: No-Build Alternative – Pedestrian Connectivity Analysis to Downtown

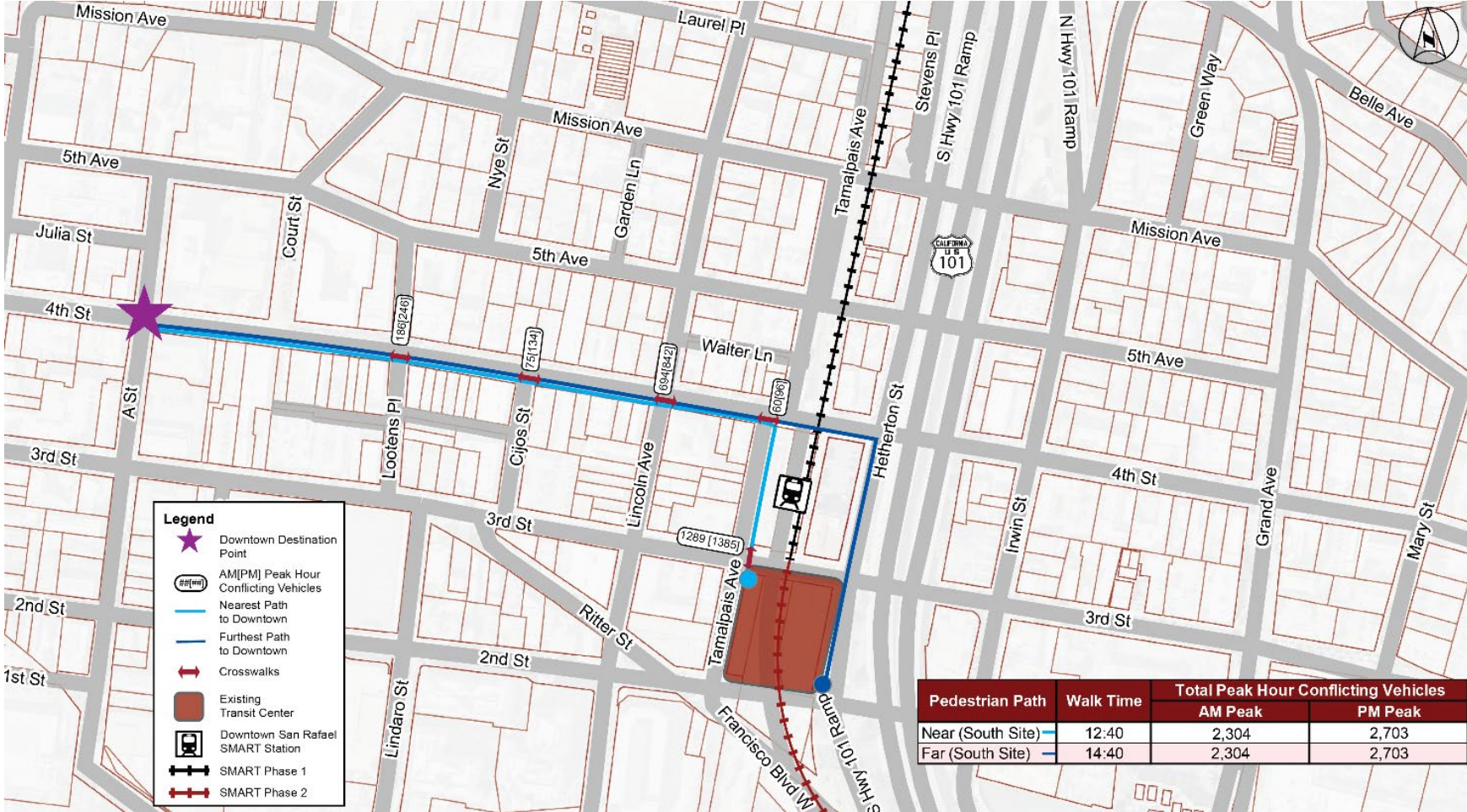
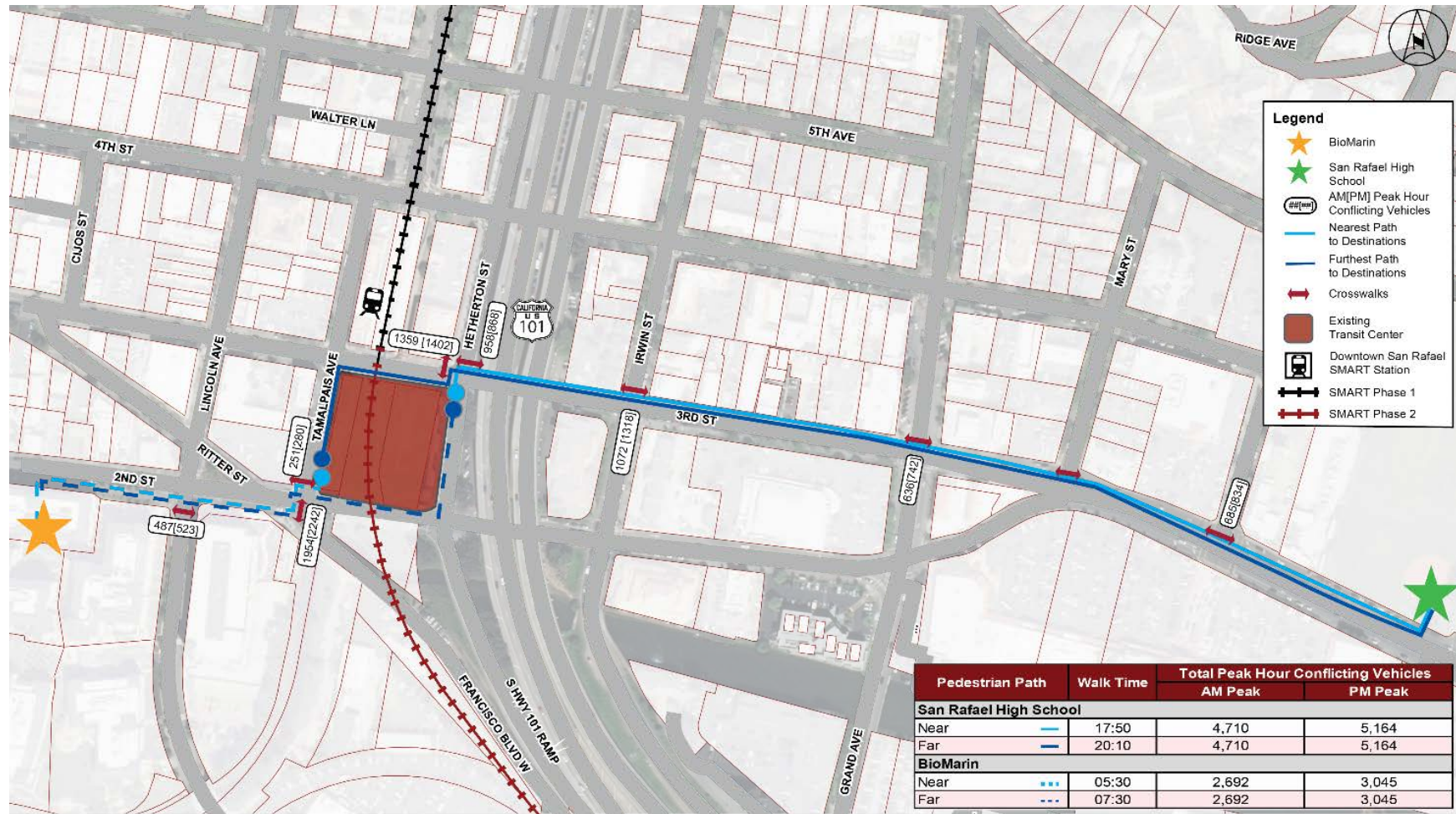


Figure 6: No-Build Alternative – Pedestrian Connectivity Analysis to San Rafael High School and BioMarin



Move Whistlestop (Preferred Alternative)

Figure 7 presents the Move Whistlestop Alternative, which is the Preferred Alternative identified in the DEIR. Key safety-related elements around the SRTC site are noted.

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. 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. Better alignment will improve intersection safety and shorten crossings for pedestrians and bicyclists on 3rd and 4th Streets. The realignment of Tamalpais Avenue between 3rd and 4th Street and restricting access for some movements to bus-only would result in reduced auto conflicts at the Tamalpais Avenue at 3rd Street intersection, which was tied for the largest number of pedestrian- and bicycle-involved collisions in the study area.

The restriction of access to bus-only movements between 3rd and 4th Street on Tamalpais Avenue, East Tamalpais Avenue, and at the SRTC driveways would significantly reduce the number of pedestrian and auto conflicts that exist today. The total number of conflict points on the south side of 4th Street between Tamalpais Avenue and Hetherton Street will increase from three to four compared to the No-Build condition. However, the number of bus movements at the Project driveways will be substantially less than the existing traffic volumes for West Tamalpais Avenue, East Tamalpais Avenue and Citibank. All movements made from the proposed driveways will be restricted to right-turns only, eliminating a major hazard to crossing pedestrians from left-turning vehicles. Additionally, the driveways will be accessed exclusively by professional-trained bus drivers with a heightened awareness for pedestrians.

Table 5 compares the existing driveway volumes on the south side of 4th Street to the planned volumes associated with both the Move and Adapt Whistlestop Alternatives. This will remove up to 161 AM and 226 PM peak hour vehicle volumes at the driveways. The reduction in the number of conflicts will improve the safety and comfort of sidewalks on 4th Street, the City's primary pedestrian access corridor to downtown.

Figure 7: Move Whistlestop Alternative

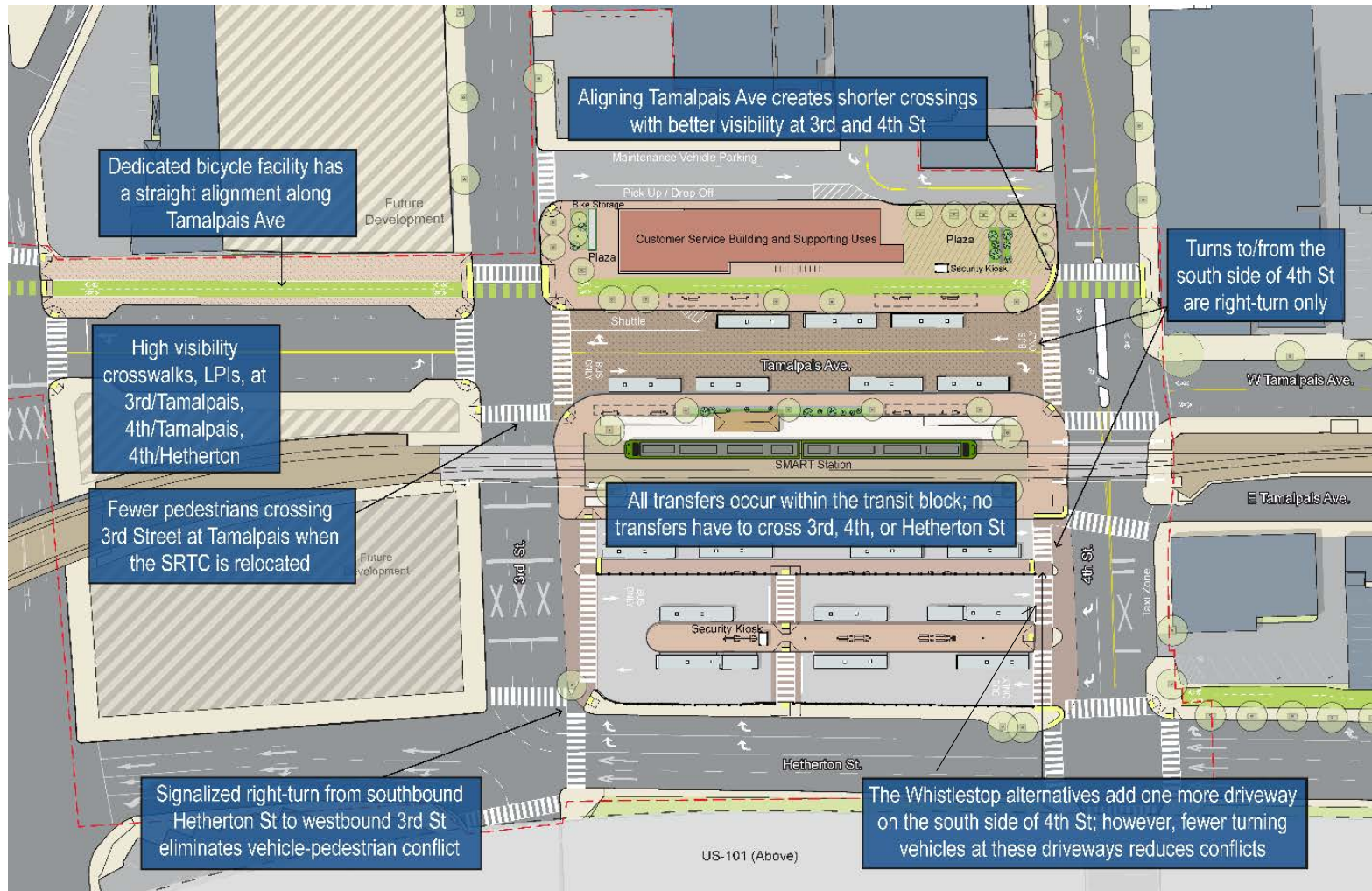


Table 5: Traffic Volumes Crossing Sidewalks on the South Side of 4th Street

Scenario	AM Peak Hour Volumes			PM Peak Hour Volumes		
	In	Out	Total	In	Out	Total
Existing Access on South Side of 4 th Street at Citibank Driveway, East Tamalpais Ave, and West Tamalpais Ave	112	103	215	127	148	275
Proposed Access on South Side of 4 th Street at Transit Center and Tamalpais Ave	12	42	54	12	37	49
Net Total	-100	-61	-161	-115	-111	-226

Data Sources: Existing peak hour volumes: January 2020 Counts and ITE Trip Generation, 11th Edition; With Project peak hour volumes: Kimley-Horn

The reduction of traffic volumes at key driveways on the south side of 4th Street, shown in **Table 5**, will also apply to the Adapt Whistlestop Alternative. The primary safety-related differences between the two Whistlestop Alternatives is related to the alignment of West Tamalpais Avenue. A better-aligned West Tamalpais Avenue, provided in the Move Whistlestop Alternative, allows for shorter and more visible crossings of 3rd Street and 4th Street for bicycles and pedestrians. The Move Whistlestop Alternative creates a contiguous intermodal station block where all transfers between SMART and bus services can be made with a short walk that does not have to cross a public street. This greatly simplifies wayfinding for pedestrians and allows pedestrians to have visibility from any bus bay to any other bus bay, simplifying the transfer process. A few transfers will have to cross West Tamalpais Avenue to access bus bays on the west side of the street. However, West Tamalpais Avenue will be bus-only and will be closed to auto traffic, which will make transfers safer and more convenient within the station block.

This alternative also allows for extending a protected bicycle facility along the west side of West Tamalpais Avenue between 2nd and 4th Streets. This facility will create a seamless bicycle connection between the new two-way cycle track on Francisco Boulevard south of 2nd Street, the adjacent Mahon Creek Path, and the station. This will also create a stronger connection to the Puerto Suello Hill Pathway that begins at the northwest corner of 4th Street & Hetherton Street. The high-quality bicycle connection along West Tamalpais Avenue to be implemented as part of this alternative is a critical component of the City’s Bicycle and Pedestrian Master Plan (Updated 2018). The realignment of this segment of West Tamalpais Avenue also creates more direct bicycle and pedestrian crossings at 3rd and 4th Streets, which shortens the crossing distance and enhancing safety by improving sight distance and visibility at these crossings.

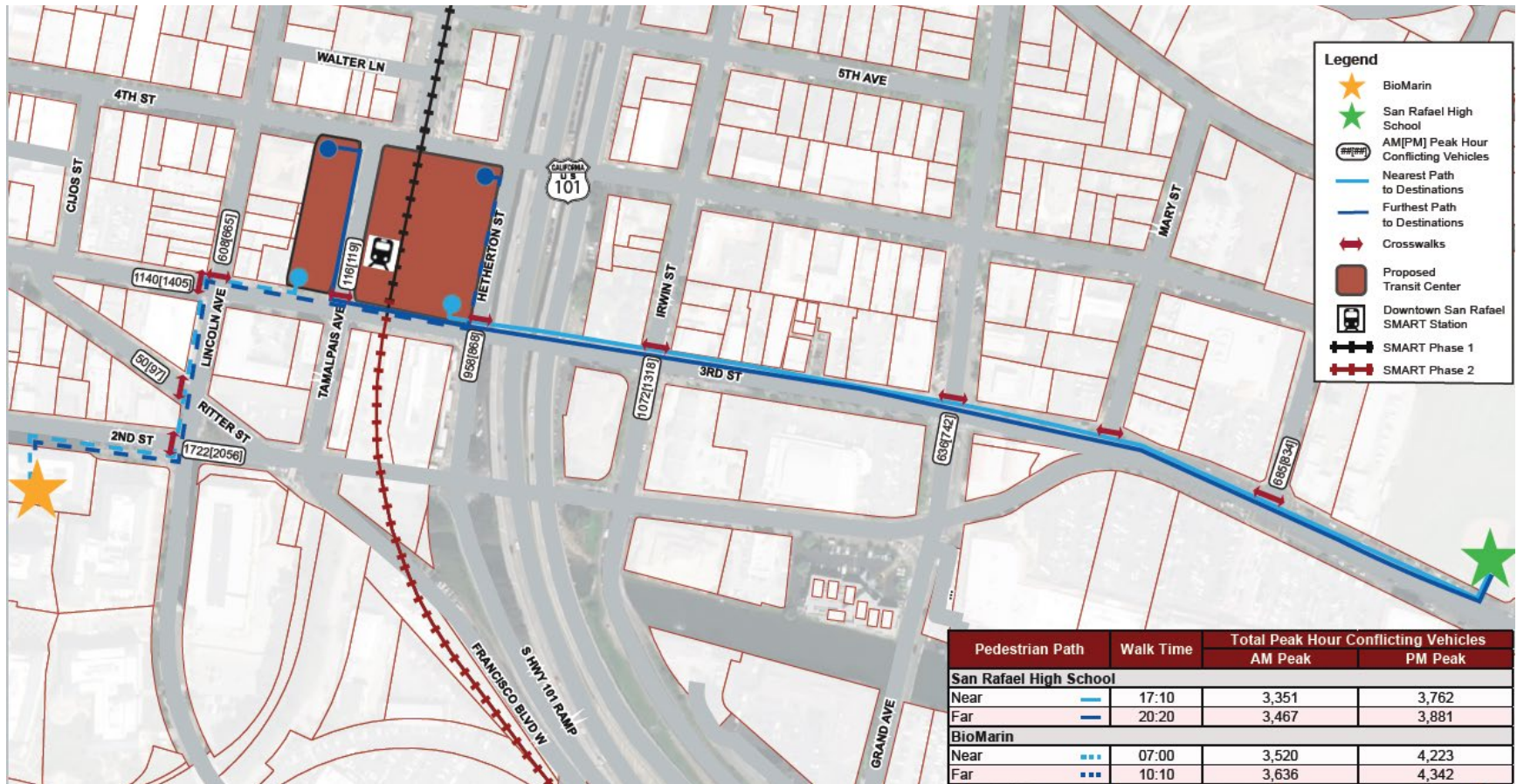
Figure 8 shows the pedestrian connectivity analysis to/from Downtown for two points on both the Move and Adapt Whistlestop Alternatives. The walk trip to 4th Street & A Street is approximately 9 to 12 minutes, with 1,000 to 1,360 conflicting vehicle movements depending on the peak hour.

Figure 9 shows the pedestrian connection analysis to/from San Rafael High School and BioMarin’s campus. The walk trip to San Rafael High School takes 17 to 20 minutes with 3,350 to 3,880 vehicle conflicts (depending on the peak hour) at Hetherton, Irwin, and Grand. The walk trip BioMarin’s campus is 7 to 10 minutes with 3,500 to 4,300 vehicle conflicts primarily at 3rd and 2nd Streets and Lincoln Avenue. This same analysis applies to the Adapt Whistlestop Alternative.

Figure 8: Move and Adapt Whistlestop Alternatives – Pedestrian Connectivity Analysis to Downtown



Figure 9: Move and Adapt Whistlestop Alternatives – Pedestrian Connectivity Analysis to San Rafael High School and Bio-Marin Campus

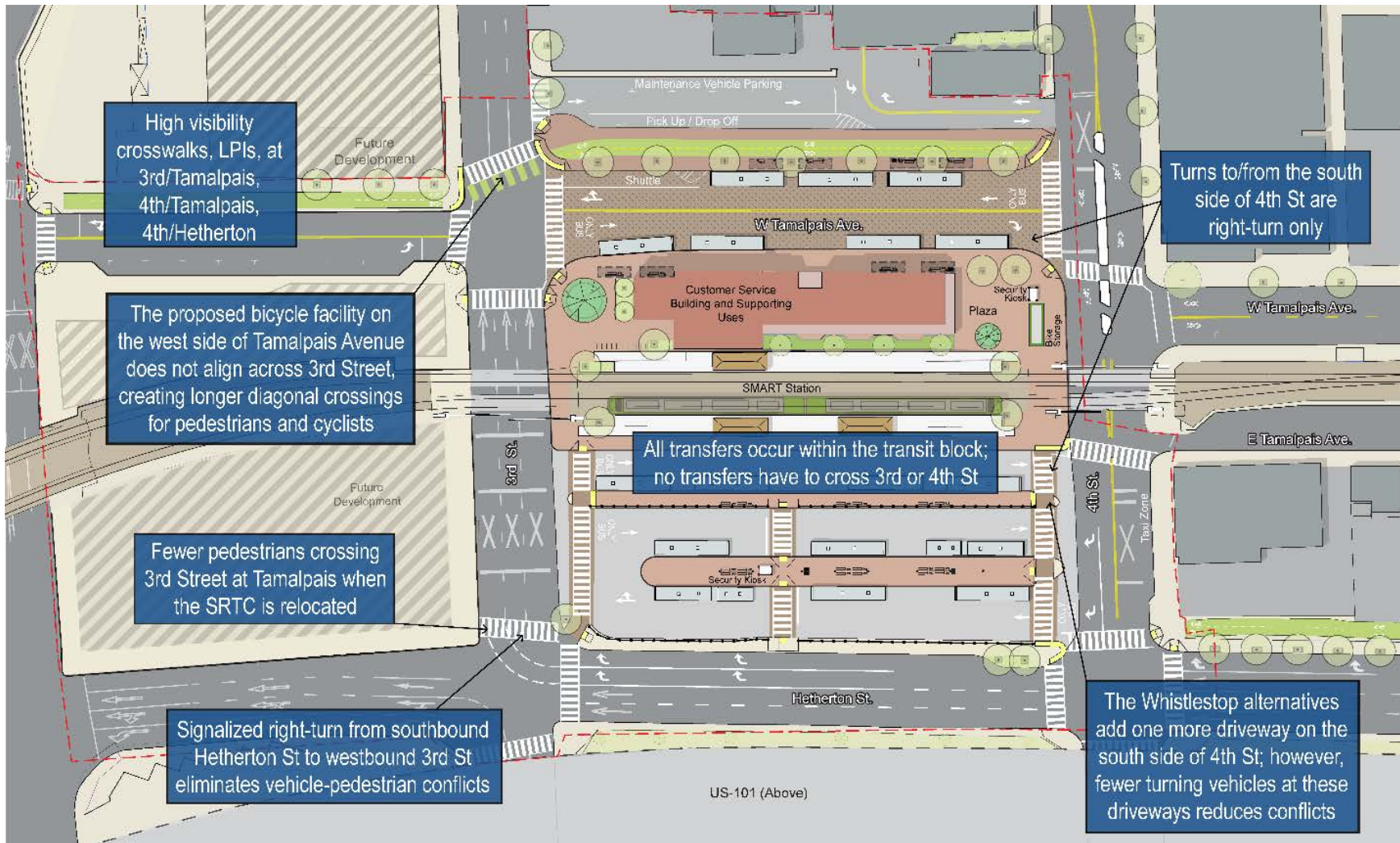


Adapt Whistlestop

Figure 10 presents the concept plan for the Adapt Whistlestop Alternative and identifies some key safety-related components of the Project around the SRTC site. This alternative includes many of the same safety improvements as the Move Whistlestop Alternative. The Adapt Whistlestop Alternative creates a contiguous intermodal station block between Hetherton Street and Tamalpais Avenue. All connecting passengers can transfer between SMART and bus services without having to cross any auto-serving streets. Relative to the No-Build Alternative, this eliminates the need to cross 3rd Street at either Tamalpais Avenue or Hetherton Street, both locations with among the highest number of pedestrian- and bicycle-involved collisions, to travel between SMART and bus. Additionally, pedestrians will not need to cross 3rd Street to travel between the SRTC and downtown San Rafael, the predominate destination. This will greatly reduce the number of auto conflicts for pedestrians.

As with the Move Whistlestop Alternative, this alternative also allows for creating a critical bicycle facility connection along Tamalpais Avenue to connect the Mahon Creek Path, Francisco bikeway, and the Puerto Suello Path. This alternative maintains West Tamalpais Avenue's existing alignment, resulting in intersection offsets at these locations, increasing crossing distances relative to the Move Whistlestop Alternative.

Figure 10: Adapt Whistlestop Alternative



4th Street Gateway

Figure 11 presents the concept plan for the 4th Street Gateway Alternative and identifies some key safety-related elements around the SRTC site. The 4th Street Gateway Alternative creates more convenient transfers for passengers connecting between SMART, GGT, and MT relative to the No-Build. Some transfers between SMART and bus can occur without having to cross 4th Street. Approximately 95 passengers per weekday day will need to cross 4th Street to make a transfer. While the requirement to cross a street is undesirable, relative to other alternatives, it is noted that 4th Street has lower traffic volumes than 3rd Street or Hetherton Street. This alternative shifts the transit center away from 2nd and 3rd Streets, towards 4th Street and 5th Avenue, both more pedestrian-friendly streets. The intersections of 4th Street with Tamalpais Avenue and Hetherton Street have a much lower number of pedestrian- and bicycle-involved collisions than the same cross-streets at 3rd Street. The alternative includes signalized double right-turn lanes from southbound Hetherton Street to 3rd Street. Signalizing the right-turn movements as part of a separate phase from the west leg pedestrian phase will eliminate conflicts between right turning vehicles and pedestrians crossing the west leg of the intersection.

Most crosswalks within the transit center blocks would require crossing two directions of bus traffic, as do crosswalks on the perimeter of the transit center. A new driveway along Hetherton Street south of 5th Avenue would introduce a new pedestrian crossing conflict on that block that does not exist today. The crosswalk along the 4th Street access to the northern transit center block would be very long as a result of bus turning movement requirements.

Figure 12 presents the pedestrian connectivity analysis for the 4th Street Gateway Alternative to Downtown. The walk times are between 10 and 12 minutes with 900 to 1,320 conflicting vehicles depending on the peak hour.

Figure 13 presents the pedestrian connectivity analysis from the 4th Street Gateway Alternative to San Rafael High School and BioMarin's campus. The walk trip to San Rafael High School takes 17 to 20 minutes with 3,350 to 4,700 vehicle conflicts. The walk trip to BioMarin takes 8.5 to 12 minutes with 3,600 to 5,100 vehicle conflicts depending on the peak hour.

Figure 11: 4th Street Gateway Alternative

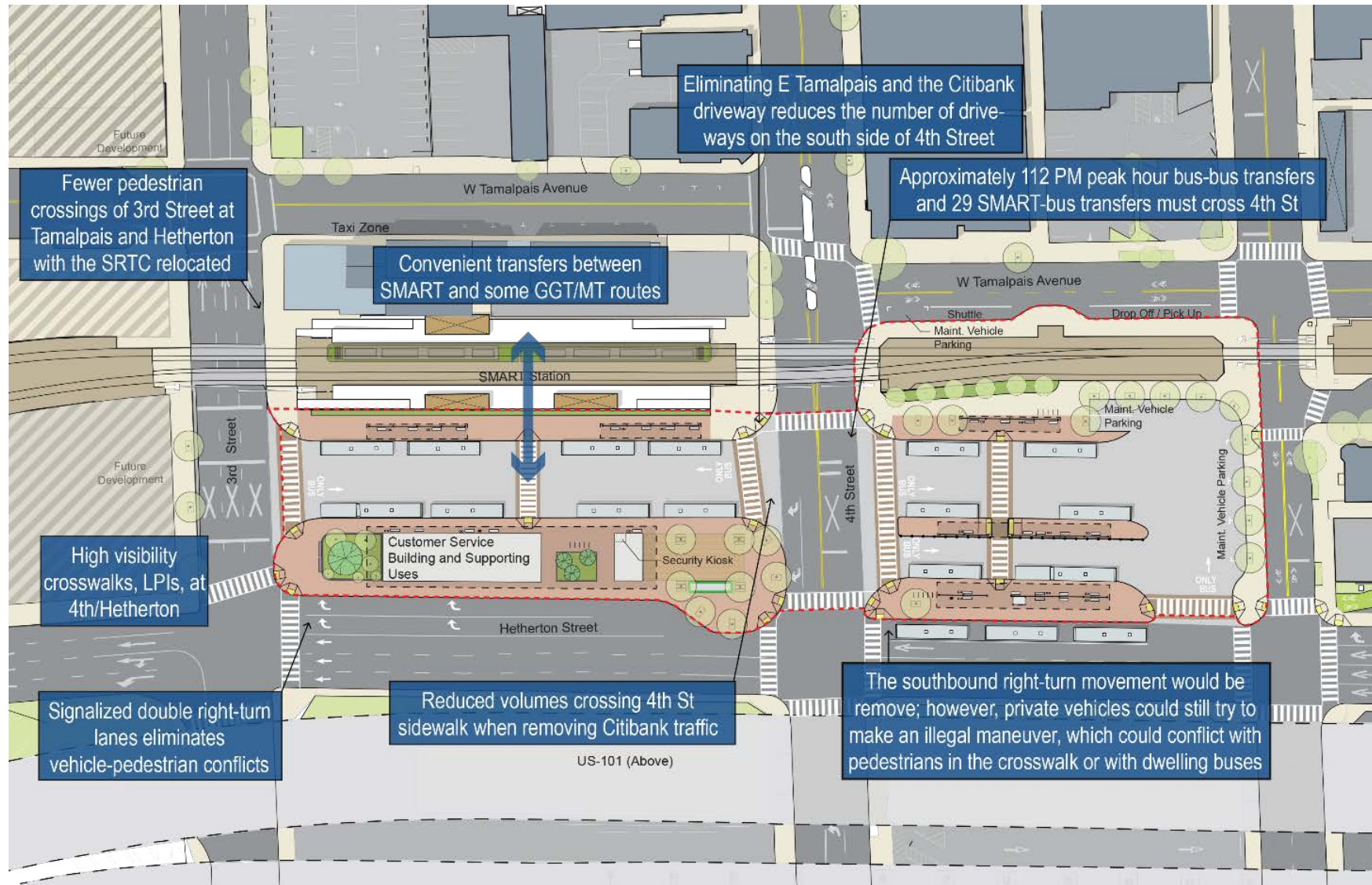


Figure 12: 4th Street Gateway - Pedestrian Connectivity Analysis to Downtown

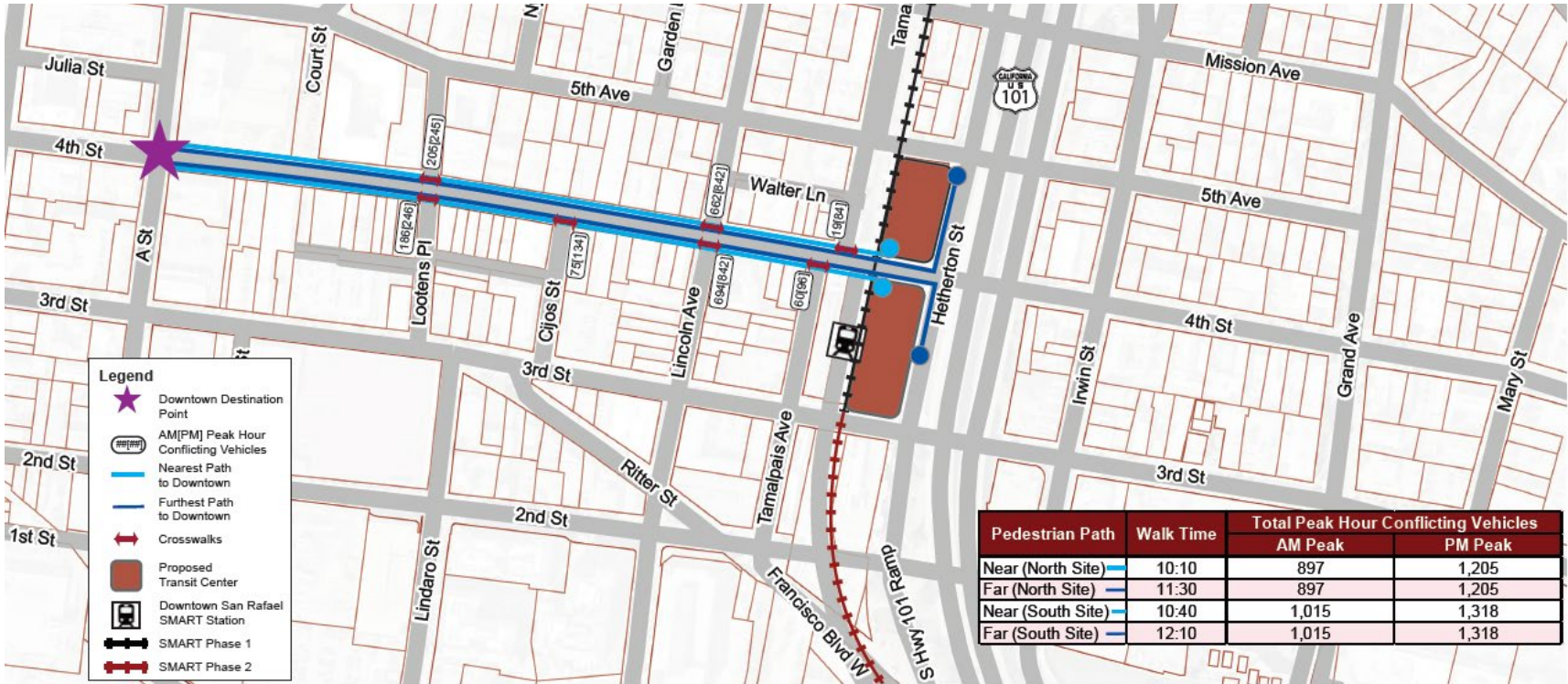
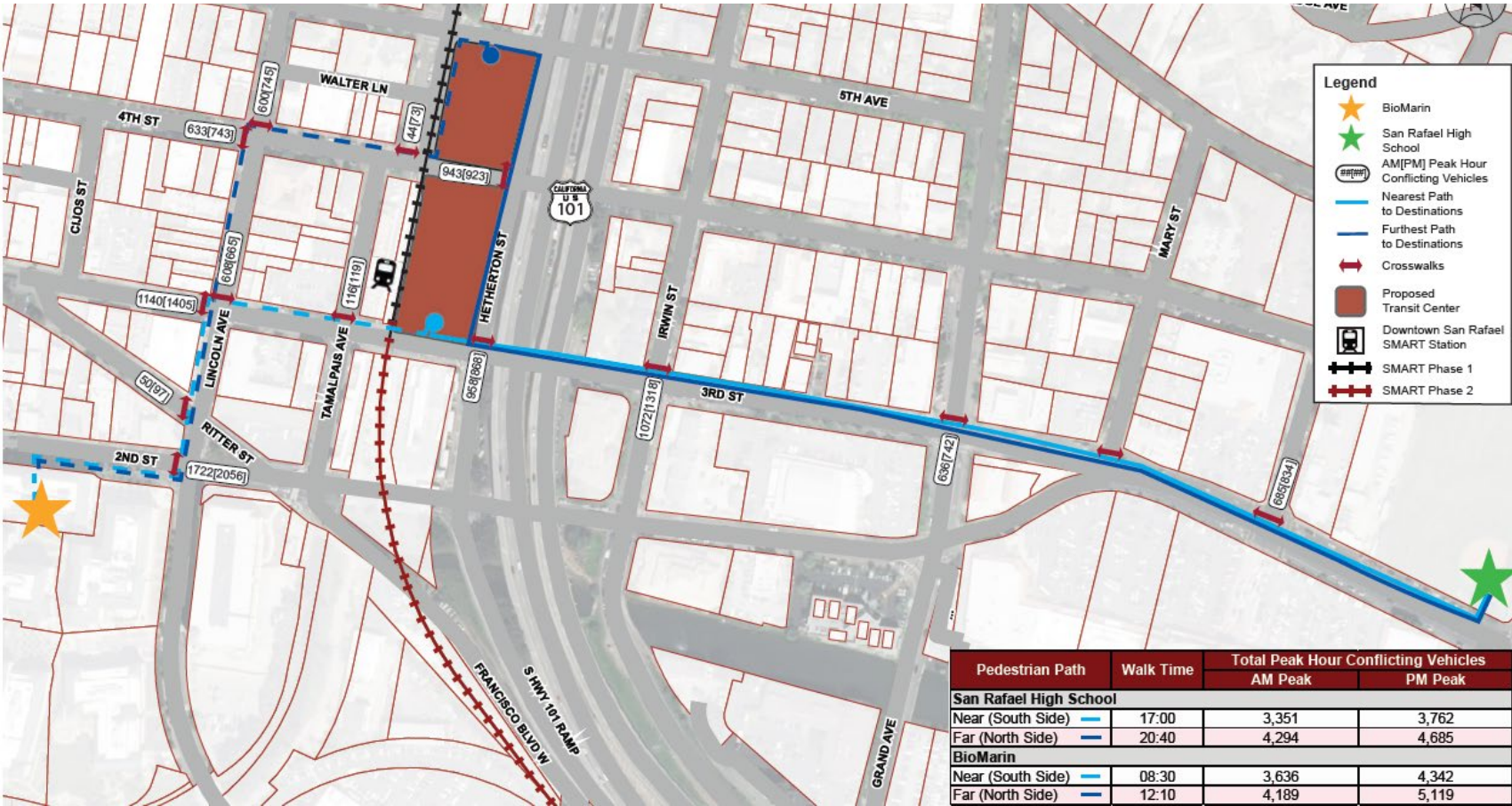


Figure 13: 4th Street Gateway – Pedestrian Connectivity Analysis to San Rafael High School and BioMarin Campus



Under the Freeway

Figure 14 presents the concept plan for the Under the Freeway Alternative and identifies some key safety-related elements around the SRTC site.

The Under the Freeway Alternative locates the SRTC bus bays under or adjacent to US-101 and is bounded by 5th Avenue, Hetherton Street, and Irwin Street and extends south of 4th Street. Most buses would access the SRTC bus bays from Irwin Street and Hetherton Street. Within the bus transit center area, there are a large number of structural columns that support the US-101 freeway viaducts. These columns can create site distance issues for pedestrians crossing bus drive aisles within the transit center. This alternative will include wider sidewalks around the Project site and other pedestrian amenities such as high visibility crosswalks and enhanced pedestrian lighting.

This alternative requires most passengers transferring between SMART and bus services to cross multiple crosswalks at Hetherton Street & 4th Street or Hetherton & 5th Avenue to connect between the SRTC and SMART. The provision of bus bays on both sides of 4th Street will require some bus transfers to cross 4th Street at either Hetherton or Irwin Streets. In addition, the heaviest pedestrian flows from the SRTC are to destinations in Downtown west of the site. This will require pedestrians traveling from the SRTC to/from Downtown to cross Hetherton Street, which they will not have to do in the other Project alternatives.

Figure 15 presents the pedestrian connectivity analysis for the Under the Freeway Alternative to Downtown. The walk trip would vary from 11.5 to 14 minutes depending on the start point at the SRTC site. The number of conflicting vehicles is the highest of the alternatives, with 1,800 to 2,370 (depending on peak hour) conflicting vehicle movements for pedestrians walking along these paths. The higher number of conflicts is due to pedestrians having to cross Hetherton Street, which they would not have to do in the other alternatives.

Figure 16 presents the pedestrian connectivity analysis for San Rafael High School and BioMarin. The walk trip to San Rafael High School would take 15.5 to 19 minutes with 2,400 to 3,500 vehicle conflicts. The number of vehicle conflicts is lower in this alternative than the others because pedestrians do not have to cross Hetherton Street. The walk trip to BioMarin would take 11.5 to 15 minutes with 4,500 to over 6,000 vehicle conflicts. This pedestrian route has the highest number of conflicts of all of the alternatives and destinations because pedestrians have to cross most of the highest volume streets (Hetherton, 4th, 3rd, and 2nd Streets) to reach the campus.

Figure 14: Under the Freeway Alternative

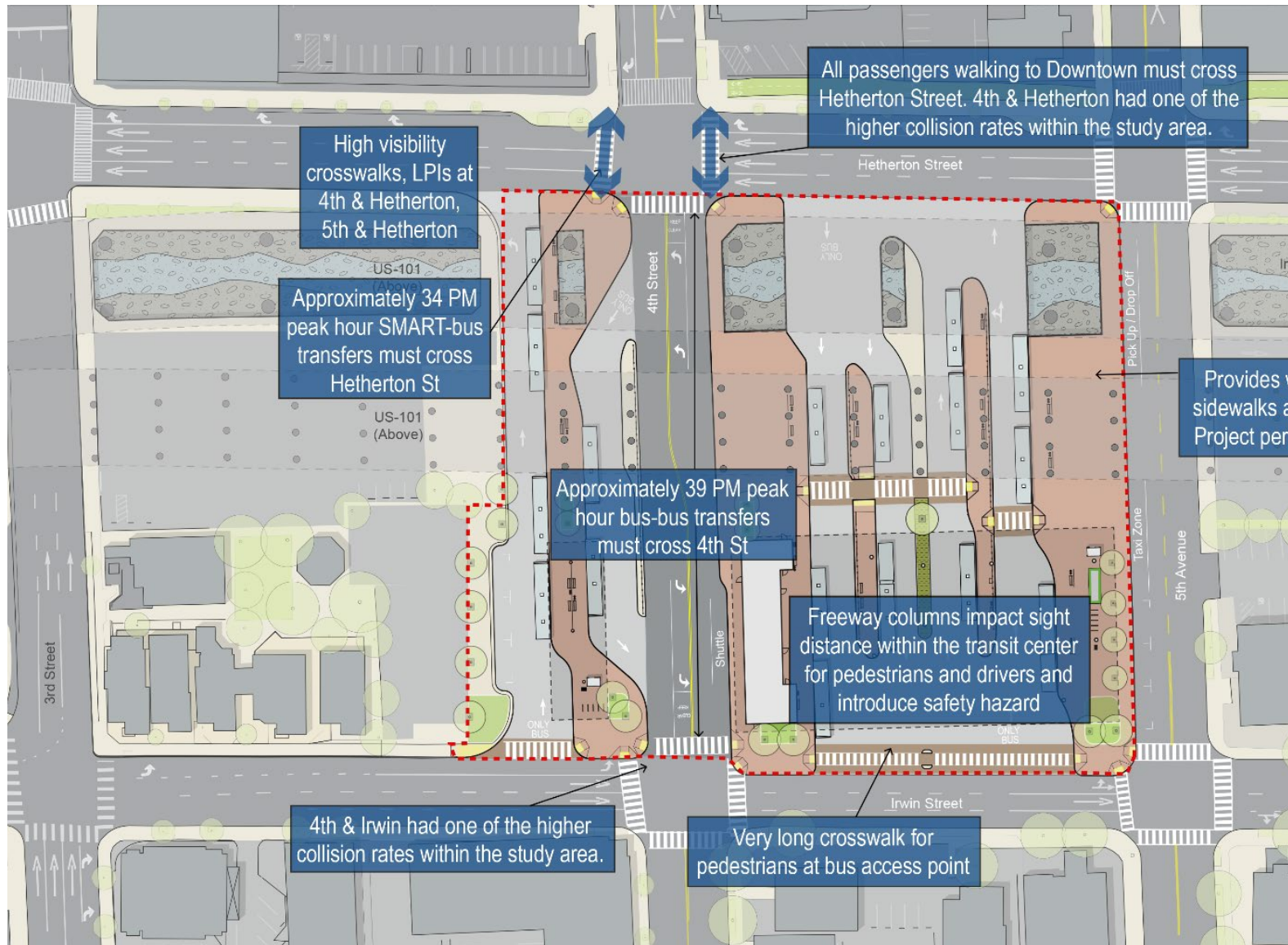


Figure 15: Under the Freeway Alternative – Pedestrian Connectivity Analysis to Downtown

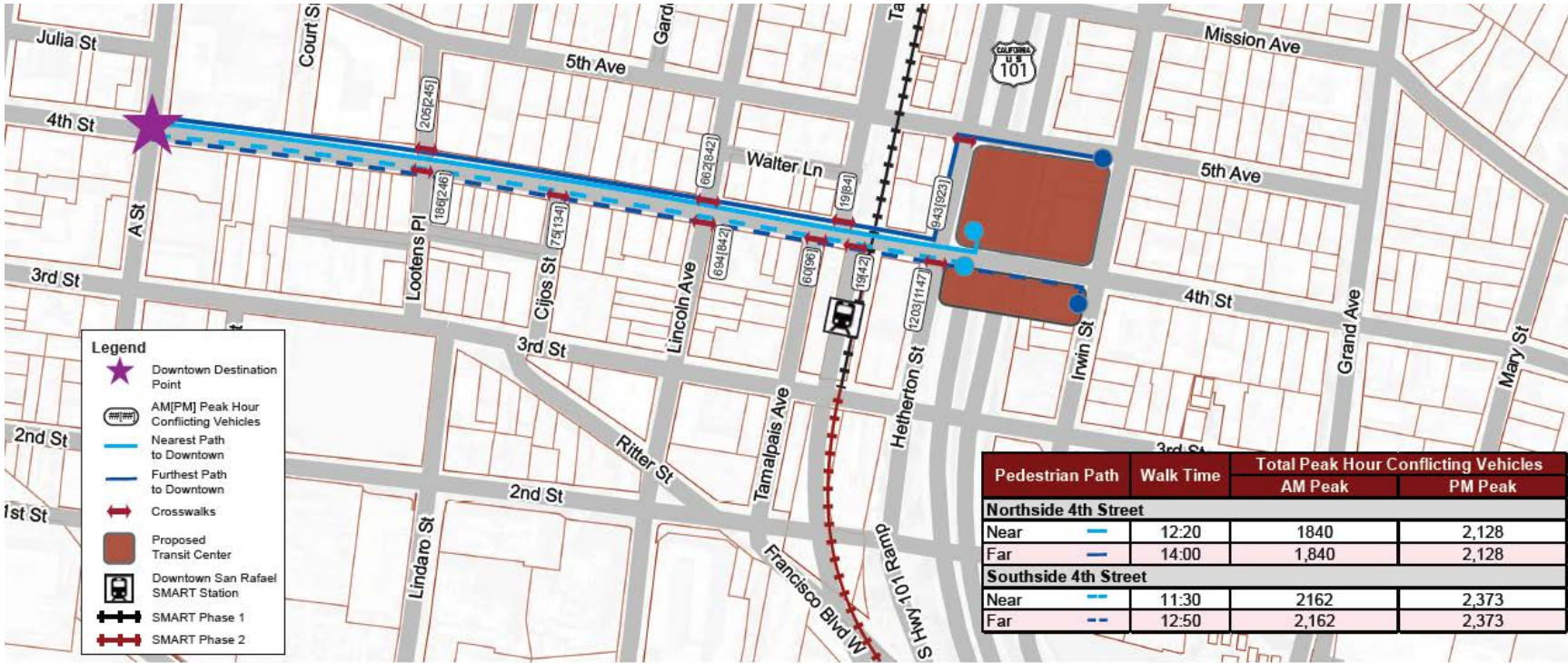
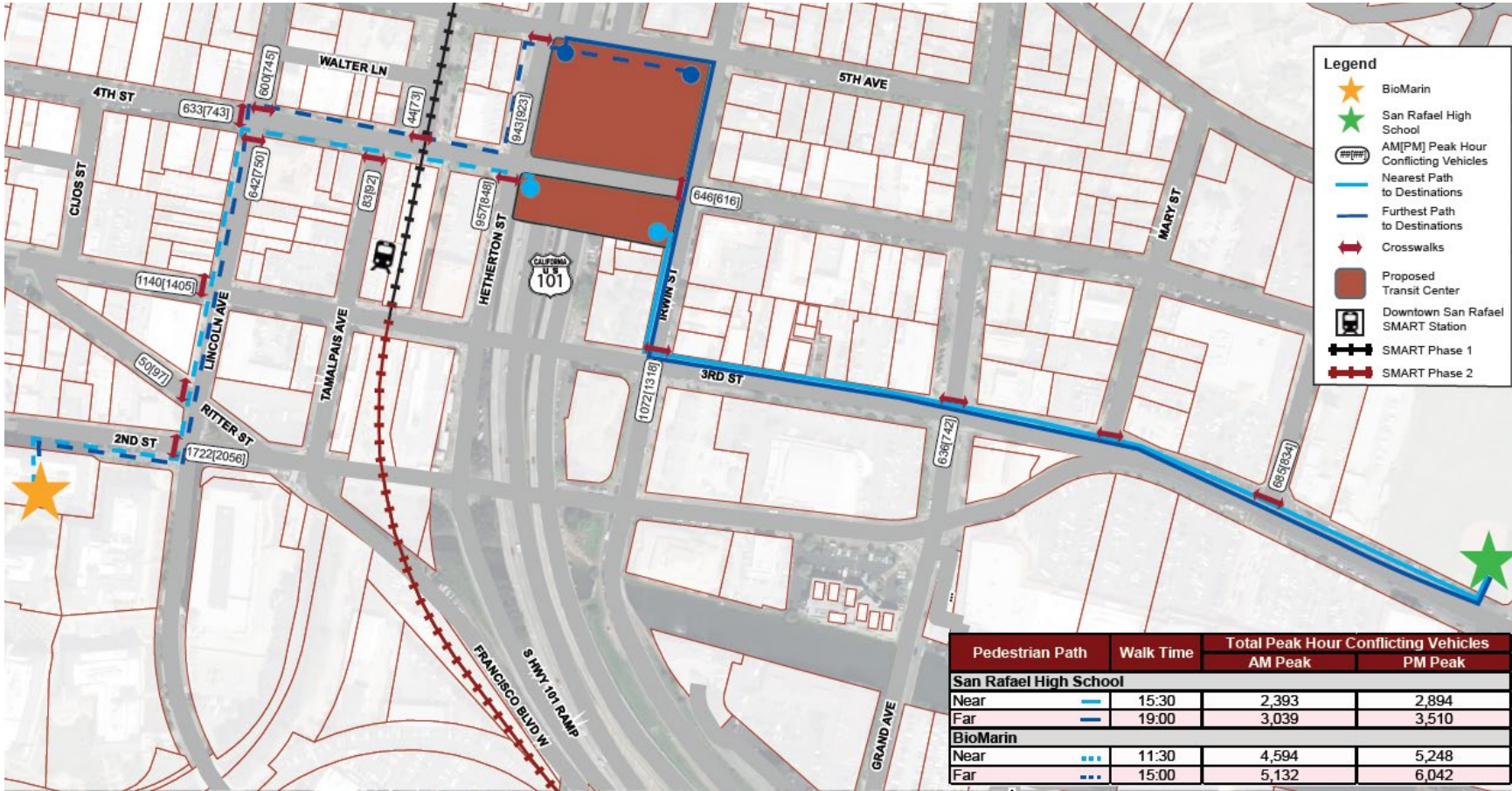


Figure 16: Under the Freeway Alternative – Pedestrian Connectivity Analysis to San Rafael High School and BioMarin



Summary of Pedestrian Paths Analysis

The pedestrian paths analysis contained above is summarized in the tables below. **Table 6** and **Table 7** depict the pedestrian volumes and conflicts associated with transfers between transit services. As shown in the tables, while the No-Build places all of the buses on the same block, the requirement to cross 3rd Street results in a significant barrier to pedestrians. The Move Whistlestop and Adapt Whistlestop Alternatives provide all transit services on the same block and thus no auto-pedestrian conflicts occur. While the transfer distances and times are similar between the Build alternatives, both 4th Street Gateway and Under the Freeway introduce significant conflicts for pedestrians transferring between transit modes.

Table 6: Bus to Bus Transfer Paths Comparison Summary

Alternative	AM Peak Hour			PM Peak Hour			Longest Bus to Bus Transfer Distance (ft)	Longest Bus to Bus Transfer Time
	Transfer Volume Across Street	Conflicting Vehicles	Conflict Quotient ¹	Transfer Volume Across Street	Conflicting Vehicles	Conflict Quotient ¹		
No-Build	0	0	0	0	0	0	450	2:10
Move/Adapt Whistlestop	0	0	0	0	0	0	625	3:40
4th Street Gateway	93	631	58,683	112	616	68,992	625	3:40
Under the Freeway	32	713	22,816	39	718	28,002	625	3:40

Note:

¹Conflict quotient is the number of conflicting vehicles multiplied by the number of transferring pedestrians

Table 7: SMART – Bus Transfer Paths Comparison Summary

Alternative	Peak Hour Transfer Volume	Conflicting Vehicle Volume	Conflict Quotient ¹
No-Build	34	1,483	50,422
Move/Adapt Whistlestop	0	0	0
4th Street Gateway	29	616	17,864
Under the Freeway	34	713	24,242

Note:

¹Conflict quotient is the number of conflicting vehicles multiplied by the number of transferring pedestrians

Table 8, **Table 9**, and **Table 10** summarize the findings of the pedestrian paths analysis to nearby destinations. As noted earlier in this document, pedestrian activity to/from the transit center is heavily focused on downtown destinations located to the north and west of the existing SRTC. Pedestrian volumes are higher accessing destinations to the north and west of the existing transit center than destinations east and south of the existing transit center by a roughly 2:1 margin. As shown in Table 8,

the Move Whistlestop, Adapt Whistlestop, and 4th Street Gateway Alternatives provide the fastest walk times to downtown and with approximately half as many conflicting auto volumes as the Under the Freeway Alternative and the No-Build Alternative.

While pedestrian movements to BioMarin and other destinations to the south of 2nd Street and San Rafael High school and other destinations to the east of Irwin Street are not as frequent as movements to downtown San Rafael, it is still informative to compare pedestrian paths of travel to these destinations. As shown in **Table 9** and **Table 10**, the No-Build, Move Whistlestop and Adapt Whistlestop Alternatives provide the best connection to BioMarin and other locations to the south of 2nd Street, while Under the Freeway provides the best connection to San Rafael High School and the No-Build Alternative provides the worst connection.

Table 8: Pedestrian Access Paths to Downtown Summary

Alternative,	Pedestrian Path	Walk Distance (mi)	Walk Time ¹	Total Peak Hour Conflicting Vehicles	
				AM Peak	PM Peak
No-Build	Near	0.38	12:40	2,304	2,703
	Far	0.45	14:40	2,304	2,703
Move/Adapt Whistlestop	Near	0.29	09:20	955	1,222
	Far	0.37	12:00	1,034	1,360
4th Street Gateway	Near (N)	0.33	10:10	897	1,205
	Far (S)	0.38	12:10	1,015	1,318
Under the Freeway	Near (S)	0.35	11:30	2,162	2,373
	Far (N)	0.45	14:00	1,840	2,128

Note:

¹Walk times provided in minutes:seconds format

Table 9: Pedestrian Access Paths to San Rafael High School Summary

Alternative	Pedestrian Path	Walk Distance (mi)	Walk Time ¹	Total Peak Hour Conflicting Vehicles	
				AM Peak	PM Peak
No-Build	Near	0.44	17:50	4,710	5,164
	Far	0.53	20:10	4,710	5,164
Move/Adapt Whistlestop	Near	0.55	17:10	3,351	3,762
	Far	0.65	20:20	3,467	3,881
4th Street Gateway	Near (S)	0.54	17:00	3,351	3,762
	Far (N)	0.66	20:40	4,294	4,685
Under the Freeway	Near	0.51	15:30	2,393	2,894
	Far	0.62	19:00	3,039	3,510

Note:

¹Walk times provided in minutes:seconds format

Table 10: Pedestrian Access Paths to BioMarin Summary

Alternative	Pedestrian Path	Walk Distance (mi)	Walk Time ¹	Total Peak Hour Conflicting Vehicles	
				AM Peak	PM Peak
No-Build	Near	0.14	05:30	2,692	3,045
	Far	0.22	07:30	2,692	3,045
Move/Adapt Whistlestop	Near	0.18	07:10	3,520	4,223
	Far	0.27	10:10	3,636	4,342
4th Street Gateway	Near (S)	0.21	08:30	3,636	4,342
	Far (N)	0.32	12:10	4,189	5,119
Under the Freeway	Near	0.30	11:30	4,594	5,248
	Far	0.41	15:00	5,132	6,042

Note:

¹Walk times provided in minutes:seconds format

Conclusions

The collision analysis provided by the City identifies that intersections around the SRTC and SMART station collision rates that are higher than statewide averages. This emphasizes the importance, as identified in the Project objectives, of improving the safety of pedestrian and bicycle access to the SRTC as part of the Project.

All of the Project alternatives incorporate a series of pedestrian and bicycle safety improvements at intersections such as high visibility crosswalks, LPIs, and enhanced lighting. These measures have been shown by FHWA and Caltrans studies to reduce collision rates with pedestrians and bicyclists.

One of the primary challenges with pedestrian and bicycle access to the existing transit center is that it is bordered on three sides with high-volume roadways. All of the Build alternatives seek to reduce the number of vehicle-pedestrian conflicts, particularly along high-volume pedestrian routes and at locations with high collision propensity. Data shows that pedestrian trips to/from the transit center are predominately oriented towards Downtown San Rafael to the north and west. By relocating the SRTC to blocks north of 3rd Street, pedestrian crossings of 3rd Street will be greatly reduced, reducing the number of pedestrian-vehicle conflicts, particularly at intersections with a history of pedestrian- and bicycle-involved collisions and fatalities.

Analysis of pedestrian paths of travel indicate that the Move Whistlestop Alternative (Preferred Alternative) is the most effective at reducing or eliminating pedestrian conflicts for both transfers between transit modes and between the transit center and Downtown San Rafael. Move Whistlestop and Adapt Whistlestop are the only alternatives where users transferring between transit modes do not experience any auto conflicts. Those alternatives, along with 4th Street Gateway, also result in the shortest walk time and substantially fewer vehicle-pedestrian conflicts for movements to Downtown San Rafael, the predominate destination for transit riders, than both the Under the Freeway and No-Build Alternatives.

The Move and Adapt Whistlestop Alternatives keep all transfer activity within the intermodal station block and passengers do not have to cross any streets, further enhancing pedestrian safety and reducing

conflicts. Crosswalks within the transit center would have good visibility and would include crossing a single-direction bus lane. Outside of the limits of the transit center itself, these alternatives also include removing the vehicle-pedestrian conflict through signalization between the southbound right-turn movement at Hetherton Street & 3rd Street and the west leg pedestrian movement, a location that has a history of severe pedestrian injuries.

A primary path of travel into Downtown San Rafael, as identified in the City's Bicycle and Pedestrian Master Plan, is 4th Street. With both Adapt and Move Whistlestop Alternatives, an additional driveway would be added relative to No-Build conditions along the south side of 4th Street east of the SMART tracks; however, the number of vehicle conflicts for pedestrians along the south side of 4th Street would be greatly reduced relative to the No-Build and all conflicts would be bus right-turns (current conditions allow auto left-turns and right-turns from East Tamalpais Avenue and the Citibank driveway). Therefore, safety for 4th Street pedestrians, including both transit center users and other pedestrians, would be greatly improved with the Preferred Project alternative as well as the Adapt Whistlestop Alternative.

The Move and Adapt Whistlestop Alternatives also incorporate dedicated bicycle facilities along West Tamalpais Avenue between 2nd and 4th Streets, connecting to the Mahon Creek Path and the new protected bicycle facility on Francisco Boulevard, which will provide safer bicycle conditions to/from the SRTC. By re-aligning West Tamalpais Avenue, crossing distances across 3rd Street and 4th Street will be shortened and visibility improved, benefitting bicycle and pedestrian safety for this movement.

The 4th Street Gateway Alternative requires some passengers to cross 4th Street to transfer between transit services, which is a lower volume street than 3rd Streets, but still introduces some conflicts. This alternative reduces the number of driveway and vehicle conflicts on the south side of 4th Street, but introduces a larger pedestrian crossing on the north side of 4th Street across the transit center driveway that increases pedestrian exposure.

While the Under the Freeway Alternative also shifts the transit center north of 3rd Street, reducing the number of vehicle conflicts for pedestrians traveling north into downtown, it shifts the transit center east of Hetherton Street, adding a new barrier with significant vehicle-pedestrian conflicts. It requires passengers transferring between SMART and bus accessing downtown San Rafael to cross Hetherton Street at 4th Street or 5th Avenue, which are high traffic volume intersections. Additionally many transfers would also have to cross 4th Street to transfer between buses or between bus and SMART. The 4th Street & Hetherton Street intersection has the highest existing total collision rate amongst intersections within the study area, while 4th Street & Irwin Street has the highest number of existing pedestrian and bicycle collisions. The 4th Street & Irwin Street intersection also has more than double the existing rate of pedestrian- and bicycle-involved collisions as any other intersection in the study area. Increasing pedestrian activity at this intersection with this alternative may introduce new safety hazards. The Under the Freeway Alternative would also introduce a very long driveway along Irwin Street, increasing pedestrian exposure and adding a barrier to pedestrian movements along Irwin Street. Additionally, crosswalks within the transit center would have constrained visibility due to the presence of columns supporting the US 101 viaduct.

In summary, all alternatives provide a number of advantages relative to the No-Build Alternative. This includes a reduction in vehicle-auto conflicts for most users and the implementation of pedestrian safety treatments. Of the Build alternatives, the Move Whistlestop (Preferred Alternative) and Adapt

Whistlestop Alternatives provide the greatest benefit to pedestrian and bicycle safety by achieving the greatest reduction in pedestrian-vehicle conflicts, placing the transit center closest to the primary destination of downtown San Rafael, locating all transit services within the same block to limit conflicts for transferring passengers, and providing a high-quality bicycle facility to close a critical gap in the City's bicycle network.