HETCH HETCHY
STUDY CORRIDOR OVERVIEW

The potential to develop a bicycle and pedestrian trail was evaluated along approximately 1.75 miles of Hetch Hetchy corridor from Ulistac Natural Area, on the banks of the Guadalupe River, to Calabazas Creek. The Hetch Hetchy corridor is 80 feet wide providing ample land to support the development of a trail. Many communities have developed the Hetch Hetchy corridor to serve as public parks and trails. The San Francisco Public Utilities Commission (SFPUC), operator of this utility corridor, strives to generate revenue from its land holdings. The City would need to enter into an agreement with SFPUC for use of the lands. Such an agreement may include a revenue mechanism, a possible bond requirement to ensure the City provides adequate maintenance of new public trail facilities and language describing how recreation facilities would be addressed during SFPUC pipeline related construction activities.

The design challenges with Hetch Hetchy come in the form of the roadway, rail and stream crossings in Santa Clara. This study evaluated six roadways, the Union Pacific Railroad (UPRR) corridor and San Tomas Aquino Creek for the potential to develop a continuous trail. Two existing bridges were also evaluated for integration into the conceptual trail alignment. These two bridges, an auxiliary automobile bridge at the Great America parking lot and the pedestrian bridge spanning Calabazas Creek, were integrated into the conceptual trail alignment. Multiple bridges are proposed to serve the new Santa Clara Stadium. One of these bridges must be available to trail users to cross San Tomas Aquino Creek.

Of the six roadways evaluated for crossings, the most challenging was the adjacent right-of-ways of Lafayette Street and the UPRR corridor. The Hetch Hetchy pipelines extend 140 feet across these two transportation corridors. A grade-separated crossing was sought in this location *(See Map 6 – Hetch Hetchy Land Availability and Crossing Feasibility Map)*.

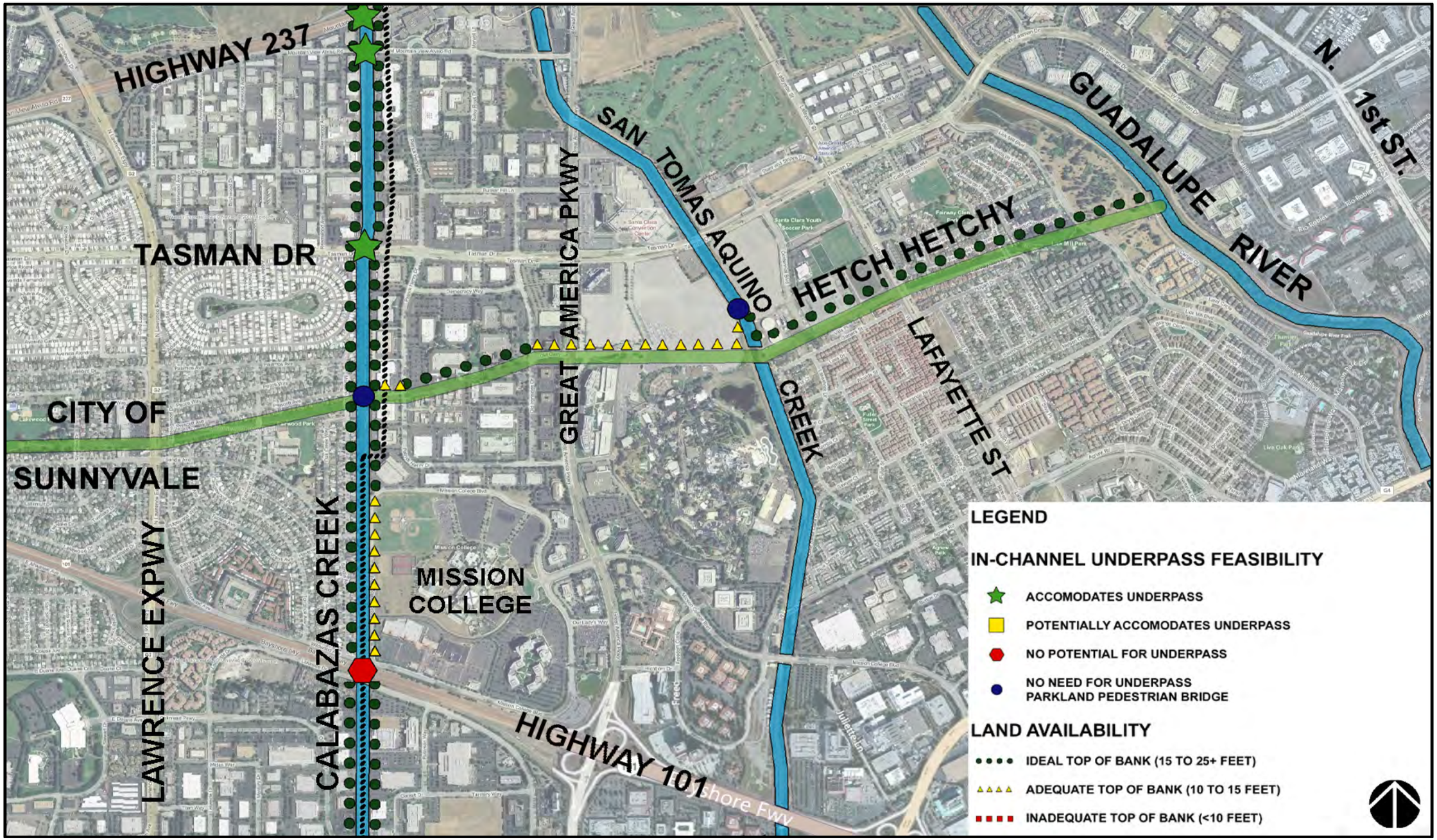
The Hetch Hetchy study corridor is presented as a single study section. Maps, cross-sections and drawings and are provided to illustrate the conceptual trail alignments and engineering designs concepts.

LOCATION AND OWNERSHIP

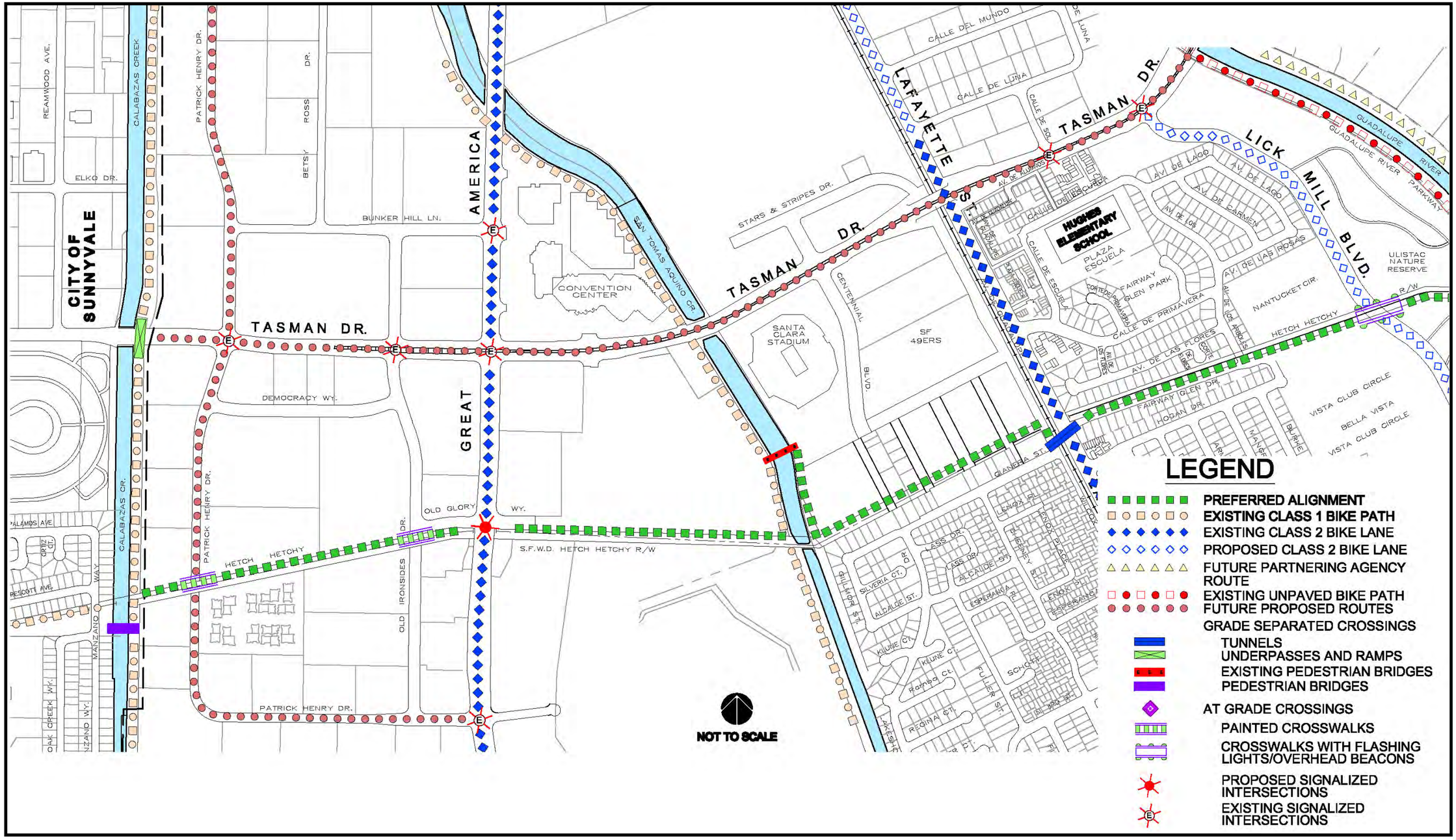
The Hetch Hetchy corridor extends from Ulistac Natural Area to Calabazas Creek. SFPUC operates the approximately two-miles of utility corridor that extends through Santa Clara. The Santa Clara Valley Water District (SCVWD) owns the three creeks in the study corridor. The roadways are owned and operated by the City. The pedestrian bridge that spans Calabazas Creek and connects to the John W. Christian Greenbelt was developed by Sunnyvale *(See Map 7 – Hetch Hetchy Corridor: Ulistac Natural Area to Calabazas Creek Conceptual Trail Alignments Map)*.

The corridor encompasses the rail line that serves the Capital Corridor and Altamont Commuter Express (ACE) trains and is owned by Union Pacific Railroad (UPRR). The Light Rail that runs along Tasman Drive, operated by the Santa Clara Valley Transportation Authority (VTA), will become accessible to more residents via the Hetch Hetchy Trail.

The John W. Christian Greenbelt in Sunnyvale is built on the Hetch Hetchy corridor.



Map 6 – Hetch Hetchy Land Availability and Crossing Feasibility Map



Map 7 – Hetch Hetchy Corridor – Ulistac Natural Area to Calabazas Creek Conceptual Trail Alignments Map

The lands surrounding Hetch Hetchy include high technology businesses and recreation venues including the AMC Mercado 20 Theatres, Santa Clara Youth Soccer Park, Great America Theme Park and the Santa Clara Stadium. Mission College is located just to the south of the trail corridor and serves approximately 28,000 students each year (Mission College, 2011).

SITE ANALYSIS SUMMARY

The Hetch Hetchy corridor provides ample right-of-way to support the development of a trail. Five of the roadways that cross the Hetch Hetchy corridor can accommodate at-grade trail crossings with some modifications to the streets. The five roadways include Lick Mill Boulevard, Avenida De Las Arboles, Great America Parkway, Old Ironsides Drive and Patrick Henry Drive *(See Figure 20 – Summary of Hetch Hetchy Corridor Feasibility Findings)*.

The combined Lafayette Street and UPRR corridor has many constraints associated with providing a grade-separated trail crossing including SFPUC and PG&E utilities. Three crossing options were evaluated in this area *(See Map 7 – Hetch Hetchy Corridor: Ulistac Natural Area to Calabazas Creek Conceptual Trail Alignments Map)*.

CORRIDOR CHARACTER, PLANT COMMUNITIES AND WILDLIFE

The Hetch Hetchy corridor will connect to the Ulistac Natural Area and represents the only protected wildland open space in Santa Clara. This 40-acre site supports a young oak savannah, live oak woodland and deciduous oak grassland. There are plans to restore a seasonal wetland, sycamore woodland and riparian forest along the edge of the adjacent Guadalupe River. This area provides refuge for many upland species.

View of the Hetch Hetchy corridor looking west from UPRR toward Great America.

The Hetch Hetchy corridor functions as part of Lick Mill Park. The landscaped park hosts many ornamental trees and is the only developed segment of the Hetch Hetchy corridor in Santa Clara. The corridor is undeveloped from Lafayette Street to the levee along San Tomas Aquino Creek. A ruderal grassland of primarily nonnative grasses and forbs grow in this location. The remainder of the corridor from San Tomas Aquino Creek to Calabazas Creek is covered by roadways and parking lots. No vegetation is present in these areas.

CONCEPTUAL TRAIL ALIGNMENTS

The proposed trail alignment would extend from Lick Mill Park to the Calabazas Creek Trail. An at-grade crossing of Lick Mill Boulevard is proposed to connect the trail to Ulistac Natural Area. The existing mid-block crosswalk on Lick Mill Boulevard could be located slightly to the north to align with the Hetch Hetchy corridor *(See Figure 21 – Lick Mill Boulevard Bicycle and Pedestrian Improvements at Ulistac Natural Area)*. Alternately, the existing crosswalk could remain and trail users directed to this crossing. Either crossing would allow bicyclists to connect to bicycle lanes and routes proposed along Lick Mill Boulevard. Santa Clara has been investigating the potential to reduce the number of travel lanes on Lick Mill Boulevard to provide enhanced bicycling opportunities. This concept would be similar to the "road diet" that is being piloted on Calabazas Boulevard. The Hetch Hetchy Trail would link with these facilities and provide a connection to Ulistac Natural Area.

SUMMARY OF HETCH HETCHY CORRIDOR FEASIBILITY FINDINGS		
Corridor Characteristics	**Habitat Quality**	**Roadway and Stream Crossings**
Land Availability: Corridor = 80 feet wide The right of way is constrained in some areas by parking lots and street crossings. ♦ Great America Parking Area ♦ R&D Sites along Old Glory Lane ♦ R&D Sites off Patrick Henry Dr.	**Habitat Types:** ♦ Landscaped Parks ♦ Ruderal Grassland ♦ Paved Parking Areas **Habitat Condition:** Modified and/or Disturbed by Development. **Habitat Sensitivity:** Ruderal Grassland and Landscaped Parks may offer habitat for breeding birds and common mammals.	**Rail Corridors:** ♦ Capital Corridor Train ♦ Altamont Commuter Express - ACE Train **Roadways:** ♦ Lick Mill Boulevard ♦ Avenida De Las Arboles ♦ Lafayette Street ♦ Great America Parkway ♦ Old Ironsides Drive ♦ Patrick Henry Drive **Pedestrian Bridges:** ♦ Auxiliary Bridge over San Tomas Aquino Creek ♦ One over Calabazas Creek

Figure 20 – Summary of Hetch Hetchy Corridor Feasibility Findings

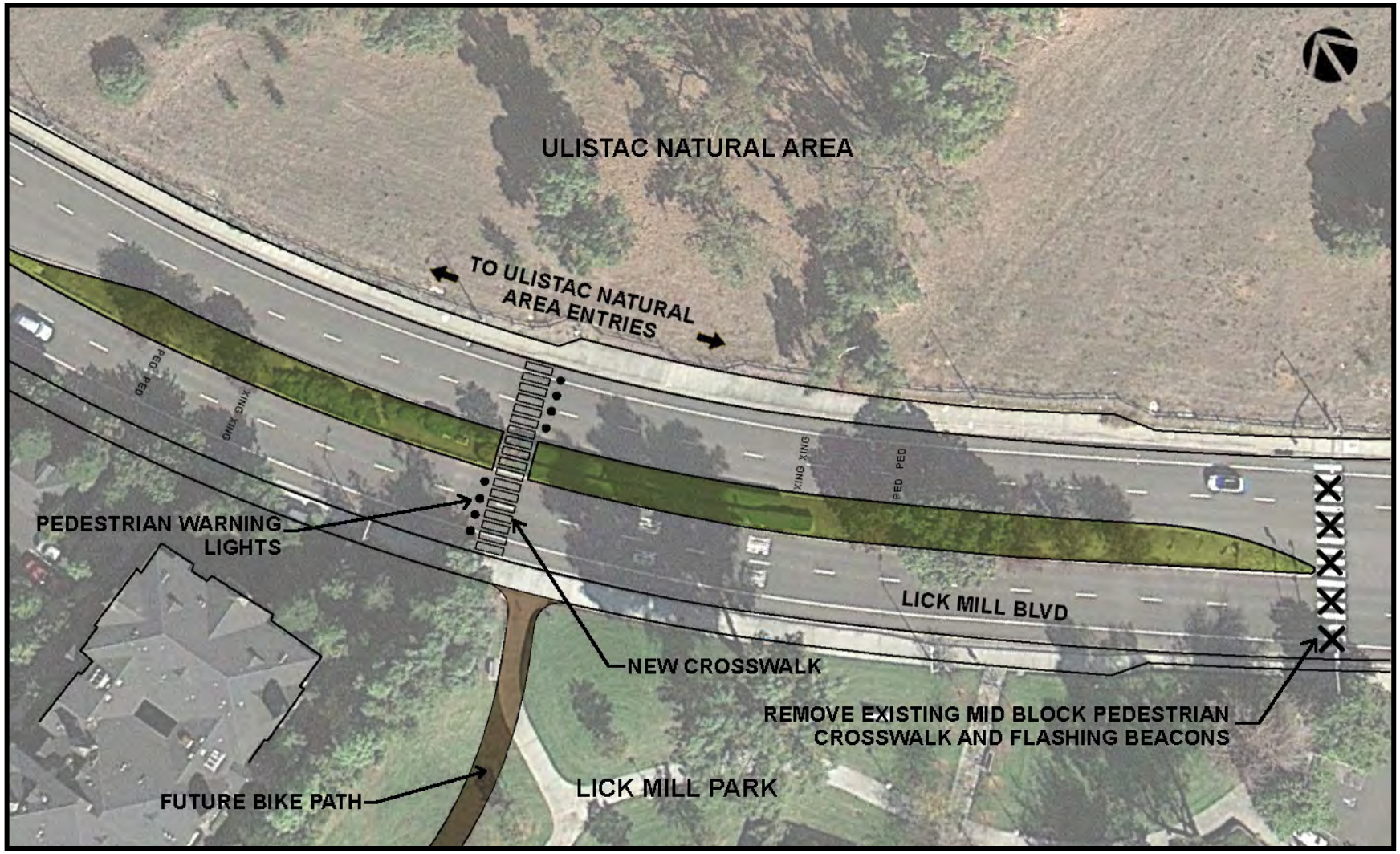


Figure 21 – Lick Mill Boulevard Bicycle and Pedestrian Improvements at Ulistac Natural Area

The Hetch Hetchy Trail would extend west through Lick Mill Park. The trail would be aligned to meet the intersection of Avenida De Las Arboles with Fairway Glen Drive. A painted crosswalk is proposed to extend the trail across Avenida De Las Arboles, a street with low traffic volume, to the turfed greenbelt that parallels Fairway Glen Drive to Lafayette Street.

Three crossing alternatives were investigated to span Lafayette Street and the UPRR corridor. A U-shaped pedestrian overcrossing was considered along Lafayette Street but rejected due to the potential impact the height of such a structure could have on residences along Lafayette Street. Other pedestrian overcrossing designs may be considered in the future in association with the Altamont Corridor Rail Project, a proposal to enhance passenger rail service between Stockton and San Jose. This high-speed rail project would extend along the UPRR corridor and serve the Great America Train Station (High Speed Rail Authority, 2011).

This study contemplated providing passage over Lafayette Street and the UPRR corridor using the existing Tasman Drive overcrossing. The alternative would require ramping the pathway along Lafayette Street to reach the elevated Tasman Drive. The right-of-way available along the edge of the street may be too narrow to support this design. In addition, Tasman Drive is located approximately 1/3 mile from the Hetch Hetchy corridor. This distance would be circuitous for bicyclists and add significant travel time for pedestrians. This option was set aside for these reasons.

The Hetch Hetchy Trail would connect to existing pathways at Lick Mill Park.

A tunnel adjacent to the Hetch Hetchy corridor aligning with Gianera Street was also evaluated as a crossing. This alternative provided a u-shaped tunnel with ramping from the southeast corner of Fairway Glen Drive to a tunnel aligning with Gianera Street. Ramping to the Hetch Hetchy corridor was proposed through Santa Clara property located between Gianera Street and the Hetch Hetchy corridor. This crossing

holds some promise but significant utility constraints require further evaluation *(See Figure 22 – Utility Constraints at Lafayette Street and UPRR Corridor)*.

The trail would extend west through the undeveloped segment of the Hetch Hetchy corridor to San Tomas Aquino Creek assuming a grade-separated crossing of Lafayette Street and the UPRR corridor can successfully be achieved. Modest ramping would be required to raise the trail to the height of the elevated flood control levee. Once on top of the levee the trail would extend north for a short distance to access one of several bridges proposed to span San Tomas Aquino Creek supplying access from the parking lots to the Santa Clara Stadium. Hetch Hetchy Trail users could continue west or head north or south on the San Tomas Aquino Creek Trail. Once across the creek the Hetch Hetchy Trail would continue west along the corridor to Great America Parkway. The corridor extends along the perimeter of the theme park behind the snack bar and amphitheatre areas. It must cross a driveway that provides access into one of the many parking areas and the entrance road to the theme park before reaching Great America Parkway. A possible overpass was investigated with this area. This was deemed infeasible due to the lack of space to place the landing west of

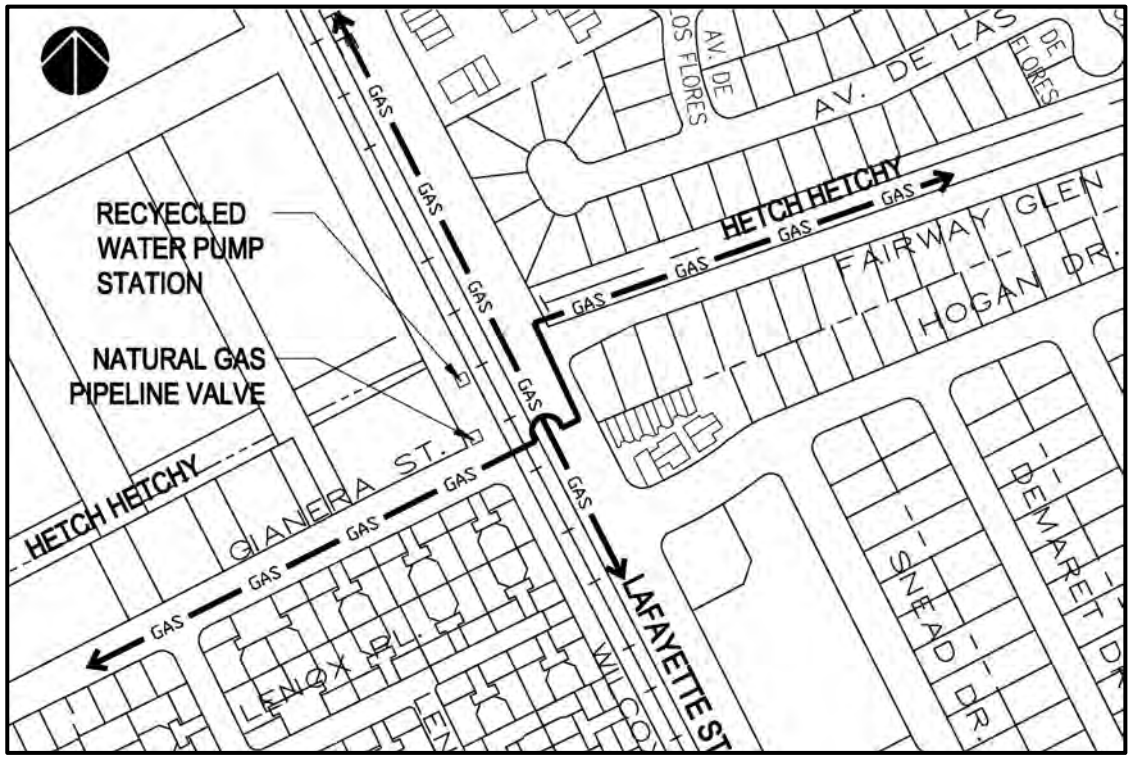


Figure 22 – Utility constraints at Lafayette Street and UPRR corridor.

Great America Parkway. A route through the theme park must be further explored in the creek trail master plan to identify the most suitable alignment that works from trail users and theme park guests.

The signalized intersection at Great America Parkway would require some modification to support the trail crossing. These modifications would be dependent upon the location of the trail crossing, which could occur either to the north or south side of the intersection depending upon the alignment within the theme park. These modifications could include additional crosswalks, redesign of the median islands and changes in signal timing. Access to Great America Parkway will link trail users to the VTA bus stop at this intersection. Trail users could connect to the on-street bicycle network that includes bicycle lanes on Great America Parkway.

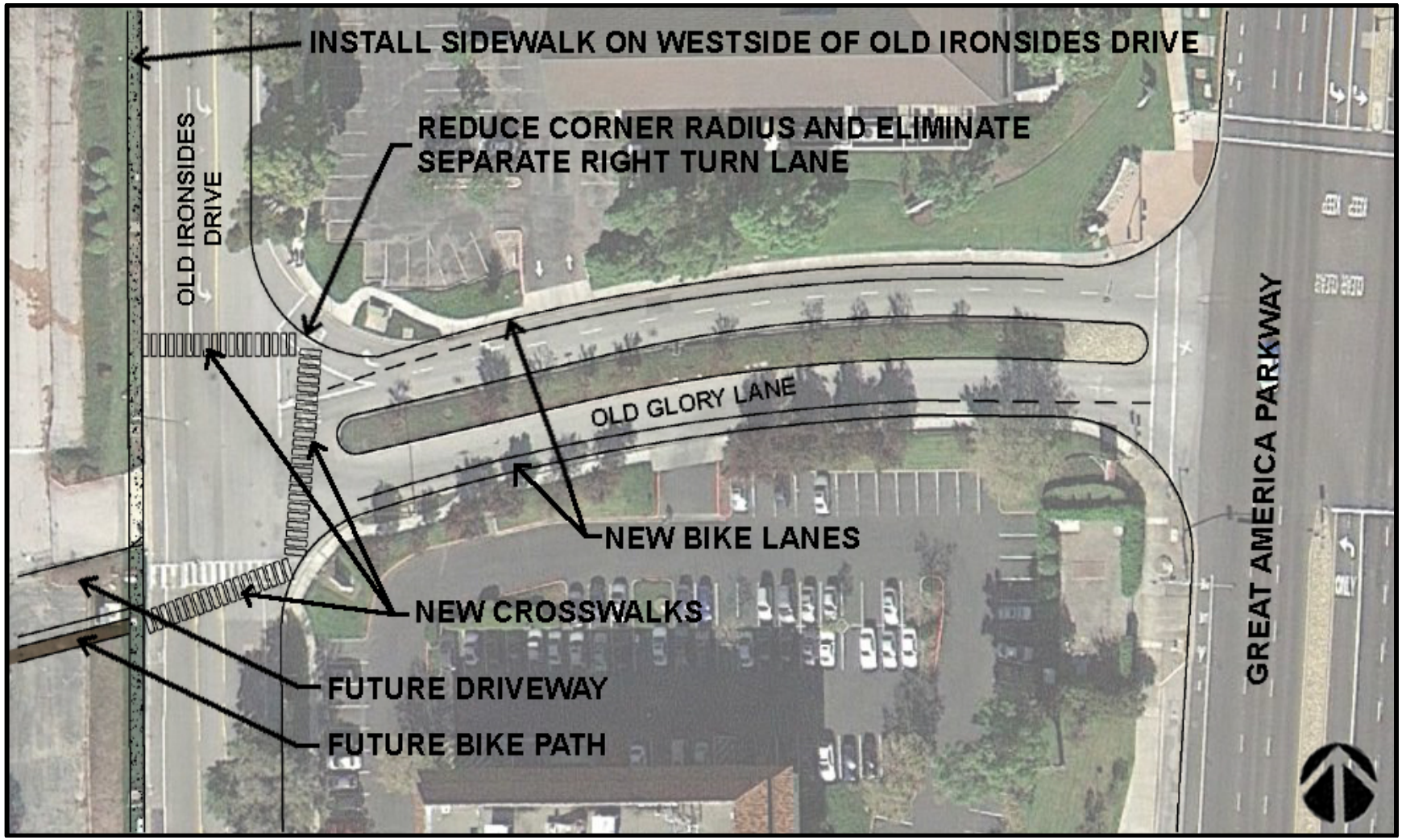


Figure 23 – Old Glory Lane Bicycle and Pedestrian Improvements between Great America Parkway and Old Ironsides Drive

Modifications to Old Glory Lane and Old Ironsides Drive are proposed to support bicyclists and pedestrians crossing Great America Parkway. These improvements include new bicycle lanes, elimination of the right turn lanes and the addition of crosswalks. The southern most crosswalk on Old Ironsides Drive will lead to a designated trail that was negotiated as part of the future Yahoo Campus. This trail will extend the length of the campus to Patrick Henry Drive *(See Figure 23 – Old Glory Lane Bicycle and Pedestrian Improvements between Great America Parkway and Old Ironsides Drive)*.

A painted crosswalk is proposed to cross Patrick Henry Drive *(See Figure 24 – Patrick Henry Drive Crossing Improvements)*. The last approximately 400 feet of the Hetch Hetchy corridor located between Patrick Henry Drive and Calabazas Creek is used as parking for the building located adjacent to the creek corridor. Access through this site must be secured to reach the elevated flood control levee and the Calabazas Creek Trail. Access sufficient to support the trail and the ramping necessary to reach the levee should be sought in the future.

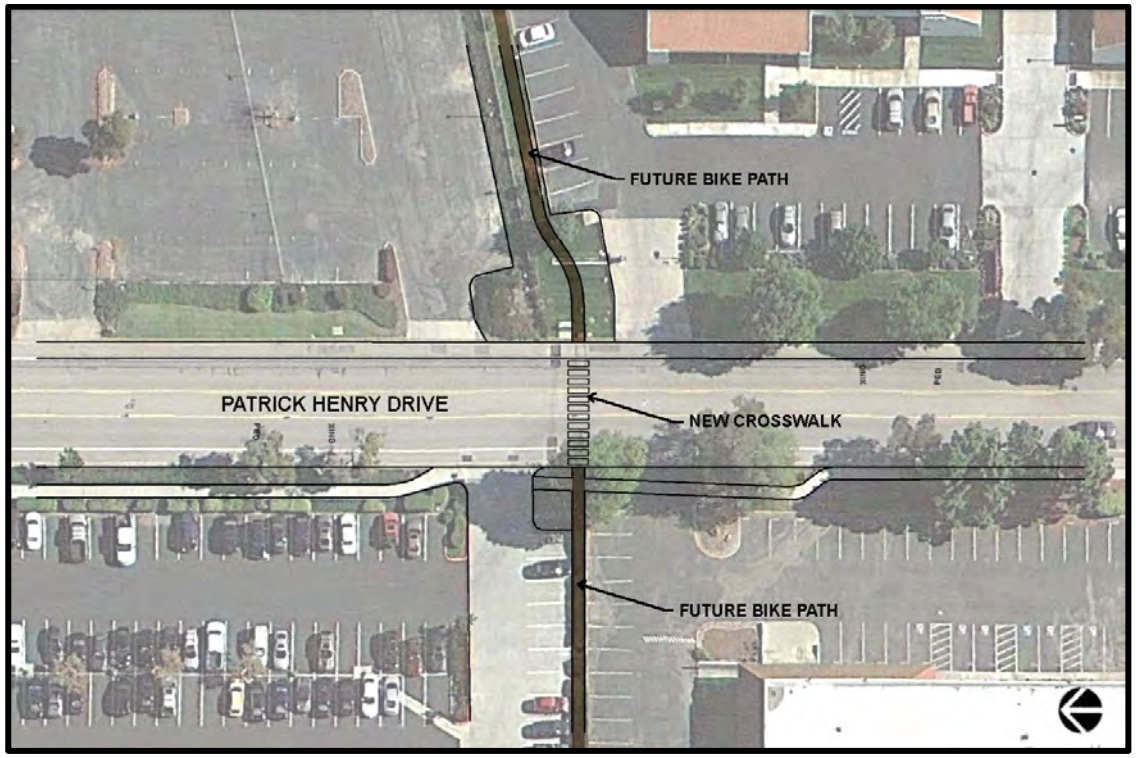


Figure 24 – Patrick Henry Drive Crossing Improvements

The Hetch Hetchy Trail would connect to the Calabazas Creek Trail and the existing pedestrian bridge that provides access across the creek to the John W. Christian Greenbelt in Sunnyvale. Trail users may continue west into Sunnyvale or travel north or south on the Calabazas Creek Trail.

NEXT STEPS

This conceptual trail alignment and roadway crossings will require further investigation during the development of the creek trail master plan. The Lafayette Street/UPRR corridor crossing is a particularly challenging crossing that requires additional evaluation. The next steps to undertake in assessing the Hetch Hetchy corridor include:

1) Further evaluate the potential to reduce the number of travel lanes on Lick Mill Boulevard.

2) Continue the investigation of the Lafayette Street/UPRR corridor crossing including undertaking preliminary design. Review preliminary design and discuss operations and access with UPRR, the California High Speed Rail Authority, SFPUC and PG&E.

3) Coordinate with the Santa Clara Stadium project to ensure access across San Tomas Aquino Creek.

4) Initiate outreach to the Great America Theme Park regarding the potential to route the trail through the parking lot to Great America Parkway.

5) Work to secure access between Patrick Henry Drive and Calabazas Creek.

6) Review all trail plans against SFPUC's ROW Encroachment Policy, Engineering Guidelines and Integrated Vegetation Management Policy.

SARATOGA CREEK STUDY CORRIDOR OVERVIEW

The potential to develop a bicycle and pedestrian trail was evaluated along approximately 3.25 miles of Saratoga Creek from Monroe Street upstream to Stevens Creek Boulevard. The land availability assessment determined that approximately 45% of the east and west banks of the creek provide adequate width to support the development of a trail. The other segments of the corridor are too narrow to support trail development. These areas of inadequate land availability are primarily in established single-family home neighborhoods. Locations that have adequate land to support trail development include the parks and schools along the creek and sites undergoing redevelopment. Santa Clara has actively sought to enhance walkability and bikeability by requiring new development projects to support trail development. Trail improvements along Saratoga Creek were secured at the former Kaiser Hospital site through the conditions of approval for The Gallery at Central Park.

This study evaluated 11 roadways spanning the creek for the potential to develop in-channel trail underpasses. Three existing pedestrian bridges were also evaluated for integration into the conceptual trail alignments. The bridge evaluations determined that 4 of the 11 bridges provided some opportunity to accommodate in-channel trail underpasses. The remaining 7 bridges provided no opportunity for modification and alternative crossing solutions were developed for the alignments. Two of the three pedestrian bridges were integrated into the conceptual trail alignments *(See Map 8 – Saratoga Creek Land Availability and Underpass Feasibility Map)*.

SARATOGA CREEK CORRIDOR

The Saratoga Creek study corridor was divided into two segments to facilitate the presentation of the site findings and conceptual trail alignments. Maps, cross-sections and drawings and are provided to illustrate the conceptual trail alignments and engineering design concepts. Although the feasibility of developing a trail was explored to Stevens Creek Boulevard, the trail alignment maps represent only those areas where a trail may be feasible. The two study sections include:

Section 1: Monroe Street to El Camino Real

Section 2: El Camino Real to Forbes Avenue

STUDY SECTION 1 LOCATION AND OWNERSHIP

Study Section 1 extends from the Monroe Street Staging Area to El Camino Real. The Monroe Street Staging Area serves the San Tomas Aquino/Saratoga Creek Trail. An existing trail extends upstream from the staging area parallel to San Tomas Expressway to Cabrillo Avenue. At the time of the preparation of the San Tomas Aquino/Saratoga Creek Trail Master Plan, the trail was planned to use city streets from Cabrillo Avenue to Barnhart Avenue in Cupertino due to numerous constraints within this approximately ¾ mile segment of the creek corridor (Sokale/Landry Collaborative, 1999). Today, a continuous trail extends along Saratoga Creek through Cupertino and San Jose.

Study Section 1 includes four roadways that span Saratoga Creek. Study Section 1 encompasses El Camino Real, which is owned and operated by Caltrans. The lands surrounding Study Section 1 are primarily zoned residential with community/regional mixed use zoning along El Camino Real *(See Figure 25 – Summary of Saratoga Creek Corridor Feasibility Findings)*.

SUMMARY OF SARATOGA CREEK CORRIDOR FEASIBILITY FINDINGS

Corridor Characteristics

Land Availability at Top-of-Bank:

West Bank

Ideal 15 to 25 Feet	33%
Adequate 10 to 15 Feet	11%
Inadequate <10 Feet	56%

East Bank

Ideal 15 to 25 Feet	30%
Adequate 10 to 15 Feet	13%
Inadequate <10 Feet	57%

Habitat Quality

Habitat Types:

- Sycamore Riparian Forest – A SCVWD "Vegetation Preserve"
- In-stream Freshwater Wetlands

Habitat Condition:
The Santa Clara Valley Water District (SCVWD) has designated Saratoga Creek from Pruneridge Avenue to the confluence with San Tomas Aquino Creek as "Vegetation Preserve" and "Vegetation Enhancement" areas. These areas were established to mitigate the flood control improvements projects of the 1980s.

Habitat Sensitivity:
Any future impacts to this riparian habitat would likely require double mitigation.

Roadway and Stream Crossings

Highways and Expressways:

- Lawrence Expressway parallels Saratoga Creek near Mauricia Avenue

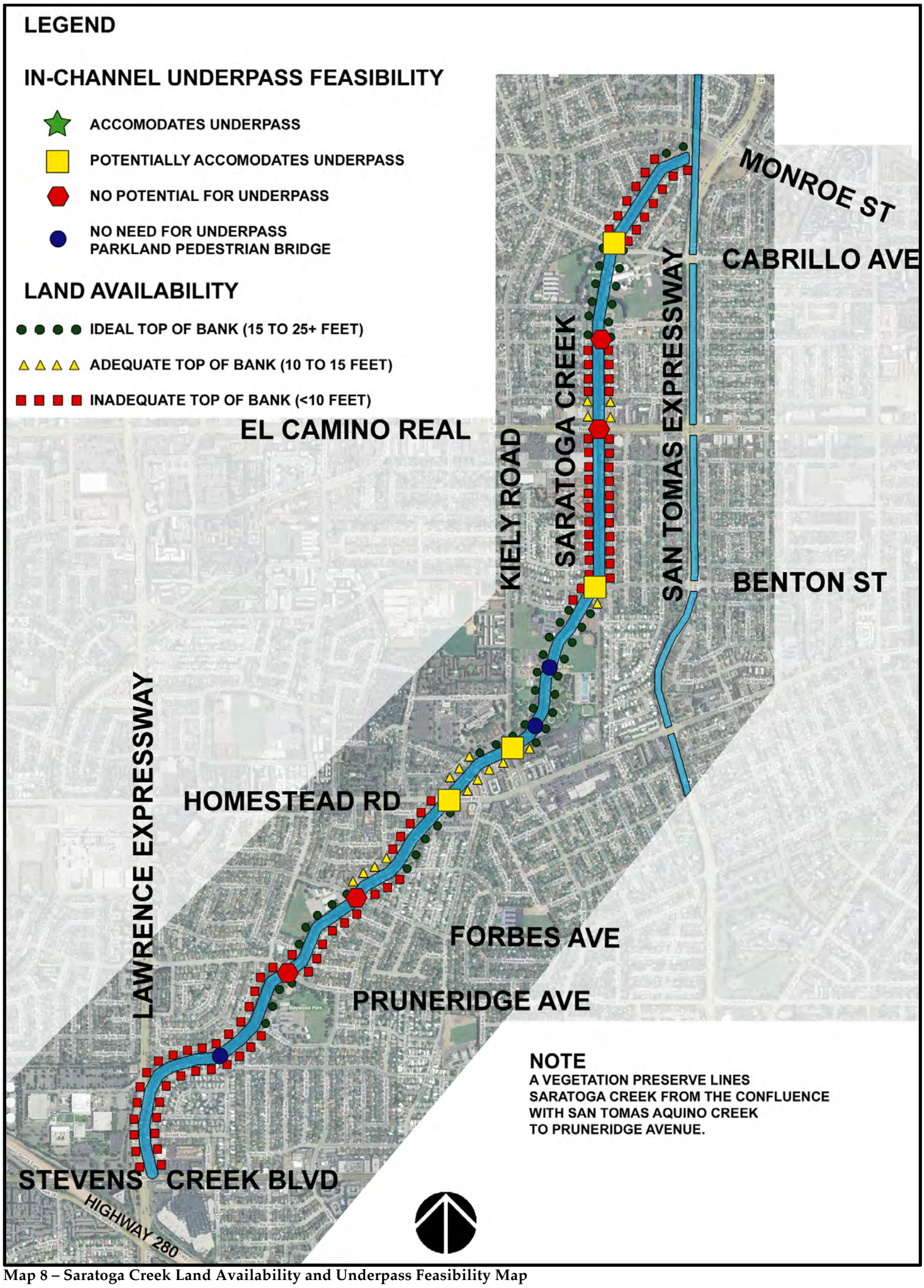
Roadways:

- Cabrillo Avenue
- Warburton Avenue
- El Camino Real
- Benton Street
- Kiely Boulevard
- Homestead Road
- Forbes Avenue
- Pruneridge Avenue
- Lawrence Expressway On-ramp
- Stevens Creek Boulevard

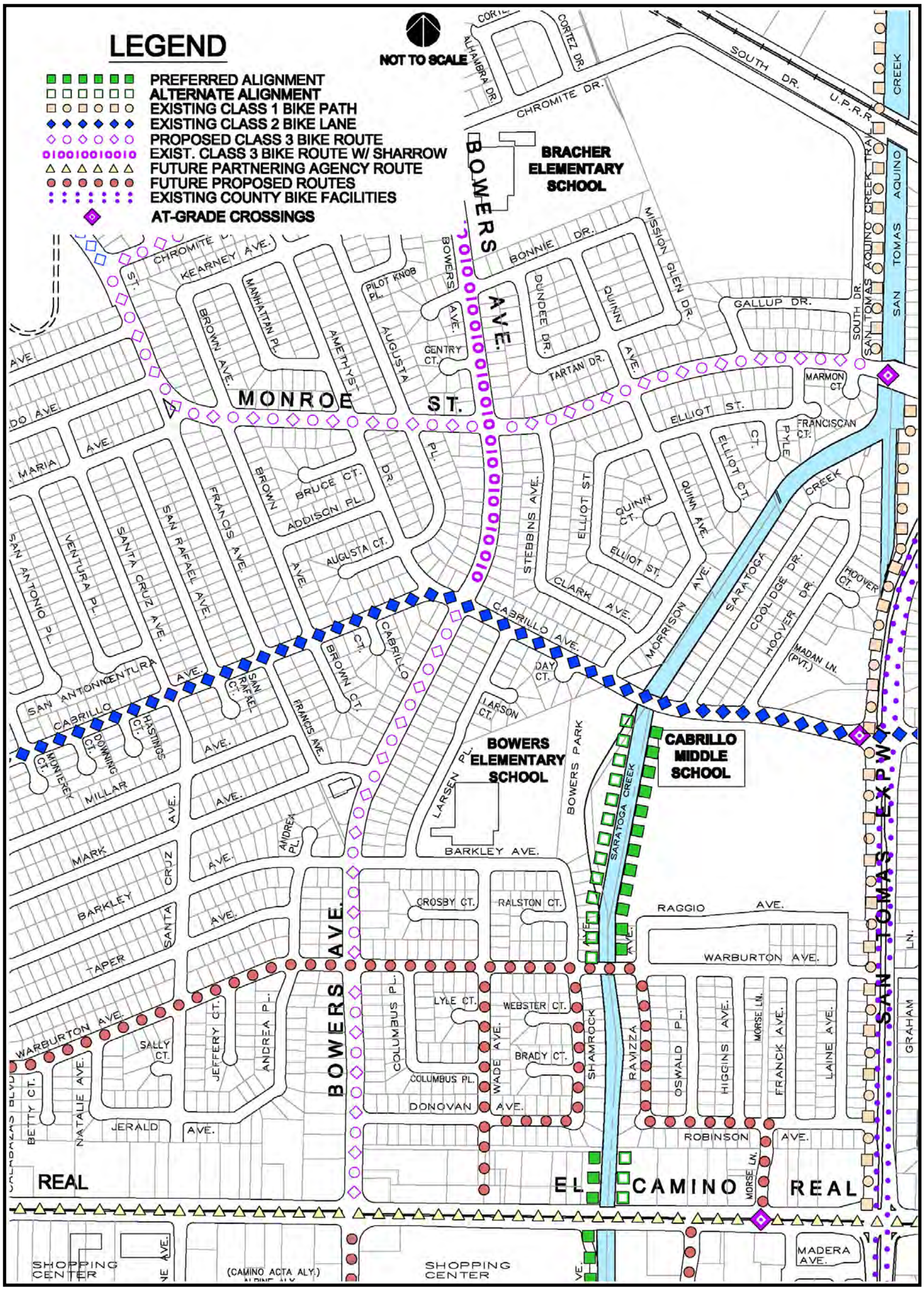
Pedestrian Bridges:

- Two at Central Park
- One at Mauricia Avenue

Figure 25 – Summary of Saratoga Creek Corridor Feasibility Findings



Map 8 – Saratoga Creek Land Availability and Underpass Feasibility Map



Map 9 – Saratoga Creek – Section 1: Monroe Street to El Camino Real Conceptual Trail Alignments Map

SITE ANALYSIS SUMMARY

Study Section 1 provides ideal top-of-bank width along both the east and west banks as Saratoga Creek flows north between Bowers Park and Cabrillo Middle School. Inadequate land availability conditions are present between Monroe Street and Cabrillo Avenue and Warburton Avenue to El Camino Real. These areas are single-family residential neighborhoods with commercial properties on El Camino Real. Redevelopment concepts have been floated for the commercial properties fronting El Camino Real on the northeast, northwest and southeast banks of Saratoga Creek. These commercial properties may offer future opportunities to secure trail easements and improvements to El Camino Real.

San Tomas Aquino/Saratoga Creek Trail approaching Cabrillo Avenue.

Four roadways span the creek in this study section. Three of these roadways cannot be modified to accommodate trail underpasses. These roadways include Monroe Street, Warburton Avenue and El Camino Real. Cabrillo Avenue has some potential to support a trail underpass, but there is insufficient land downstream to support the underpass ramps or trail. Bicyclists and pedestrians are directed to the on-street network at Cabrillo Avenue *(See Map 9 – Saratoga Creek – Section 1: Monroe Street to El Camino Real Conceptual Trail Alignments Map)*.

CREEK CHARACTER, PLANT COMMUNITIES AND WILDLIFE

Study Section 1 of Saratoga Creek is designated as a "vegetation preserve" by the SCVWD. This designation follows significant flood control improvement and habitat mitigation efforts from the 1980s. The corridor is characterized as a young California sycamore woodland (Sawyer, 2009). The tree canopy along Saratoga Creek includes native California sycamore *(Platanus racemosa)*, Fremont cottonwood *(Populus fremontii)*, coast live oak *(Quercus agrifolia)*, valley oak *(Quercus lobata)*, white alder *(Alnus rhombifolia)*, red willow *(Salix laevigata)* and arroyo willow *(Salix lasiolepsis)*. An understory of native perennials and shrubs is also found within the "vegetation preserve" on Saratoga Creek.

California mugwort and hummingbird sage grow on the banks of Saratoga Creek.

The corridor receives storm flows and urban runoff. The creek bottom is gravel throughout most of the channel and contains patches of in-stream freshwater wetlands. These isolated wetlands are likely maintained throughout the year by irrigation water that reaches the storm drain system and flows to the creek. These wetlands and deep pools in channel provide habitat for Pacific chorus frogs and many stream invertebrates. The confluence with San Tomas Aquino

Creek is completely lined with concrete and includes a vertical drop between the streams.

CONCEPTUAL TRAIL ALIGNMENTS

A creekside trail alignment could be extended approximately ¼ mile along either the east bank adjacent to Cabrillo Middle School or along the west bank through Bowers Park in Study Section 1. The east bank alignment is preferred due to its direct access to Lou Vierra Field and potential connection to El Camino Real at Morse Lane. The east bank alignment would extend along the creek on an existing access road to reach Raggio Avenue. The east bank is preferred because the existing access road extending along the creek would reduce the need for significant new construction, thus limiting impacts to habitat in the creek corridor *(See Figure 25 – Summary of Saratoga Creek Corridor Feasibility Findings)*.

This east bank alignment provides a primarily off-street route to El Camino Real and locally serves this neighborhood. The VTA proposes a reconfiguration of El Camino Real. The Bus Rapid Transit (BRT) Project proposes to convert two travel lanes into dedicated bus lanes, adds new bicycle lanes and improves pedestrian crossings along El Camino Real (VTA, 2012). Access to these transit improvements makes this short stretch of trail more useful.

The City has also proposed neighborhood access routes between Warburton Avenue and El Camino Real. These on-street routes would extend along Wade Avenue or Shamrock and Donovan Avenues to Wade Avenue to connect to the service road located behind the businesses on El Camino Real. The service road could potentially facilitate a pedestrian and bicycle connection to El Camino Real via the former El Real Nursery site located on the west bank of Saratoga Creek. Redevelopment of the nursery property would provide an opportunity for a creek trail connecting to El Camino Real *(See Map 9 – Saratoga Creek – Section 1: Monroe Street to El Camino Real Conceptual Trail Alignments Map)*.

Additional on-street alignments in this study section are the subject of other reports. These on-streets facilities are planned or exist on Cabrillo Avenue and San Tomas Expressway. Cabrillo Avenue provides access east and west. The trail parallel to San Tomas Expressway will connect to the San Tomas Aquino/Saratoga Creek Trail to the north and extend south along the expressway.

NEXT STEPS

These conceptual trail alignments will require further investigation during the development of the creek trail master plan. The next steps to undertake in assessing Study Section 1 include:

1) Continue coordination with Cabrillo Middle School on potential trail alignment locations.

2) Continue to monitor future development proposals to secure additional trail and habitat improvements along Saratoga Creek.

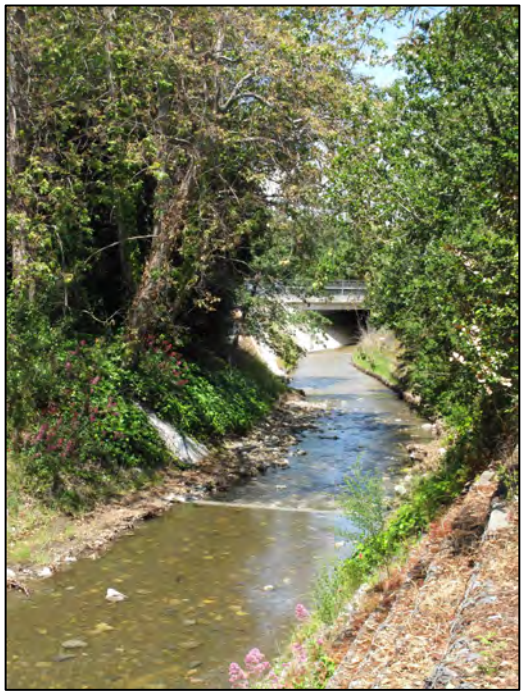
STUDY SECTION 2
LOCATION AND OWNERSHIP

Study Section 2 extends 2.50 miles from El Camino Real upstream to Stevens Creek Boulevard. A trail is not feasible for approximately 1.00 mile from Forbes Avenue to Stevens Creek Boulevard. Approximately 1.10-mile segment of trail is aligned within the creek corridor on parcels of land owned by the City of Santa Clara and the SCVWD. Santa Clara has also secured additional trail dedications within this constrained section of the corridor. Trail improvements along Saratoga Creek were secured at the former Kaiser Hospital site through the conditions of approval for The Gallery at Central Park. Trail improvements are being sought at the Calvary Baptist Church on Forbes Avenue.

Study Section 2 includes 7 roadways that span Saratoga Creek and Lawrence Expressway that parallels the corridor in the vicinity of Stevens Creek Boulevard. Lawrence Expressway is owned and operated by the Santa Clara County Roads & Airports Department (County Roads). The lands surrounding Study Section 2 are developed as parks and schools, which are surrounded by residential neighborhoods *(See Figure 25 – Summary of Saratoga Creek Corridor Feasibility Findings)*.

SITE ANALYSIS SUMMARY

Study Section 2 provides ideal to adequate top-of-bank width along one or both banks of Saratoga Creek from Benton Street to Forbes Avenue. Primarily inadequate land availability conditions are present between Forbes Avenue and Stevens Creek Boulevard. These areas are single-family residential neighborhoods or schools with buildings constructed on the edge of the creek.



Looking downstream at Homestead Bridge.

Seven roadways span the creek in this study section. Four of these roadways cannot be modified to accommodate trail underpasses. These roadways include Forbes Avenue, Pruneridge Avenue, the Lawrence Expressway on-ramp and Stevens Creek Boulevard. Benton Street, Kiely Boulevard and Homestead Road offer some potential to support the development of trail underpasses. All of these roadways have tapered abutments that have the potential to be modified to create trail underpasses. Each the roadways has a unique set of conditions *(See Map 8 – Saratoga Creek Land Availability and Underpass Feasibility Map)*.

CREEK CHARACTER, PLANT COMMUNITIES AND WILDLIFE

SCVWD has designated Saratoga Creek upstream to Pruneridge Avenue as either a "vegetation preserve" or a "vegetation enhancement area." These creekside lands serve as mitigation for previous flood control projects. Beyond Pruneridge Avenue the riparian canopy is narrow, but dense until reaching Lawrence Expressway. In Study Section 2 the plant community includes California sycamore *(Platanus racemosa)*, Fremont cottonwood *(Populus fremontii)* and coast live oak *(Quercus agrifolia)* and other nonnative trees associated with residential and roadway landscaping.

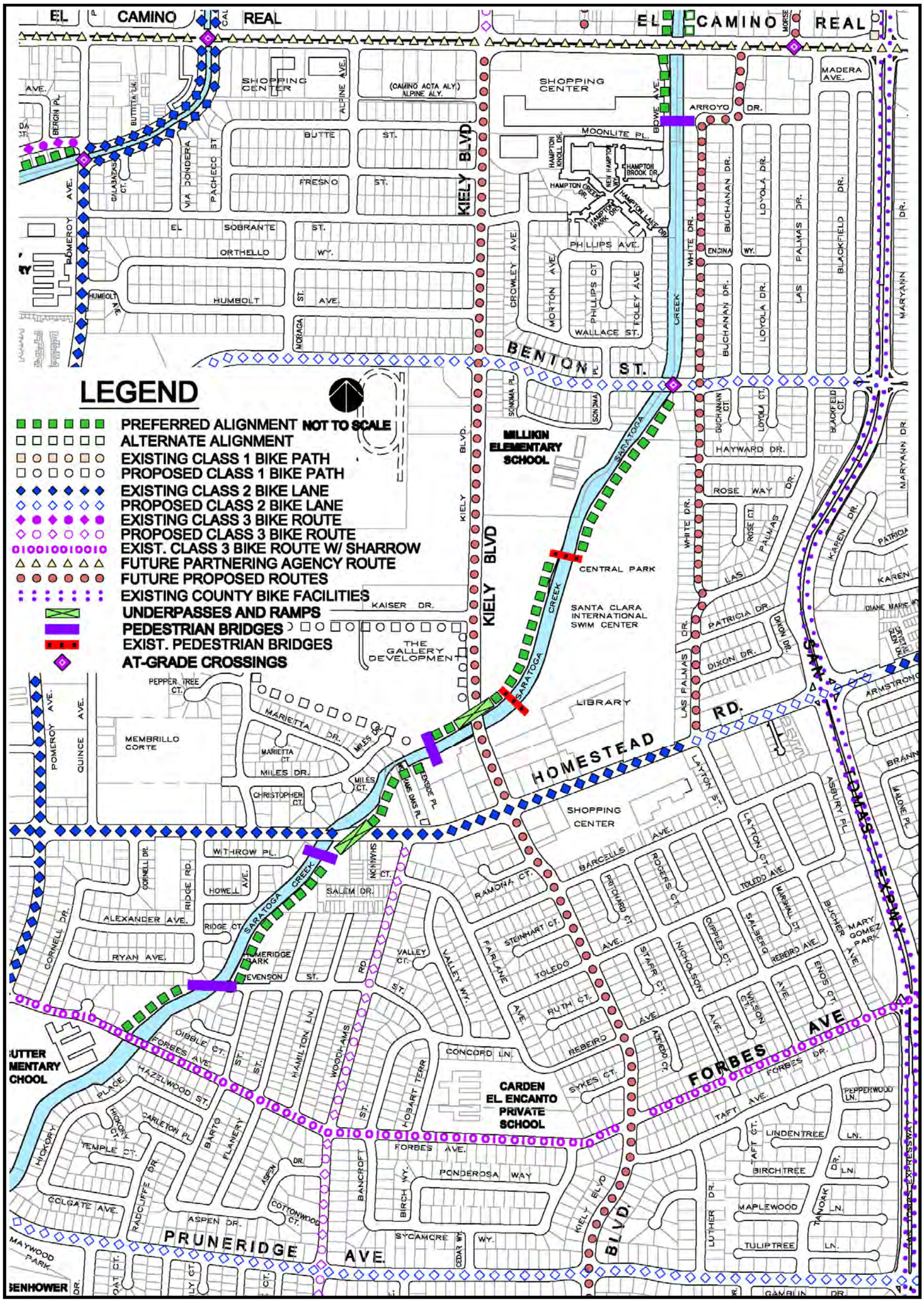
The corridor has few trees on the west bank as it parallels the expressway. The channel receives more sunlight in this short stretch behind Mauricia Avenue. The channel flows through a culvert beneath the ground from the Lawrence Expressway on-ramp upstream to the south side of the Stevens Creek Boulevard bridge. The culvert extends diagonally under Stevens Creek Boulevard and the Lawrence Expressway on-ramp.

View looking upstream at the Kiely Boulevard bridge and maintenance access ramp.

CONCEPTUAL TRAIL ALIGNMENTS

The proposed trail alignment in Study Section 2 would connect to Benton Street and extend approximately 1.10 miles to Forbes Avenue using portions of both the east and west banks of Saratoga Creek. The trail would extend along the east bank of the creek behind the parks service center and tennis courts in Central Park. Two existing pedestrian bridges span the creek in Central Park. The trail would cross the most downstream bridge located near the Community Recreation Center. Once on the west bank the trail would extend to Kiely Boulevard. Trail improvements within Central Park will be needed to clarify the route and minimize cross traffic with service access to the Community Recreation Center. The purpose of crossing to the west bank is to align the trail with a proposed underpass at Kiely Boulevard. The trail underpass on the west bank takes advantage of the trail improvements secured through the conditions of approval for The Gallery at Central Park, a 27-acre residential development that will include 766 townhomes, apartments and single-family homes.

A trail underpass is proposed at Kiely Boulevard. The roadway bridge has tapered abutments and a ramp that extends downstream from the northeast corner of the bridge. This ramp provides SCVWD with maintenance access to the bottom of the channel. The bridge soffit is 12.5' above the bottom of the channel providing some potential for the channel to support a trail underpass and continue to pass



Map 10 – Saratoga Creek – Section 2: El Camino Real to Forbes Avenue Conceptual Trail Alignments Map

Looking upstream at Saratoga Creek from Homestead Road. The creek flows beneath Homestead Road at an angle making a trail underpass design more challenging.

A SCVWD maintenance access ramp is located on the southwest corner of Homestead Road. Access to the channel bed must be retained. SCVWD access is also available at Kiely Boulevard. Providing access at only one location should be further explored in the creek trail master plan.

Looking downstream at Saratoga Creek from Homestead Road in the fall.

flood flows while maintaining the existing water surface elevation. The underpass may require relocation or integration into the trail underpass design. There is potential to remove part of the tapered concrete lining back to the bridge abutment to create a trail *(See Figure 26 – Typical trail underpass design to a tapered abutment bridge (TANS) structure similar to Kiely Boulevard)*. The ramping needed to access the trail underpass would extend upstream into the lands dedicated for trail development at The Gallery and downstream into Central Park.

A complete reconstruction of the Kiely Boulevard bridge would have multiple benefits beyond providing a grade-separated route for trail users. The Kiely Boulevard bridge was built in 1962 prior to the near build-out conditions that exist in Santa Clara Valley today. A new bridge could be widened and set farther back on the creek banks to allow for increased channel capacity and improvements to the on-street bicycle and pedestrians facilities.

The trail would extend a short distance behind The Gallery before crossing on a new pedestrian bridge to reach lands owned by Santa Clara on the east bank. The location of the pedestrian bridge must be integrated into the development plans for The Gallery.

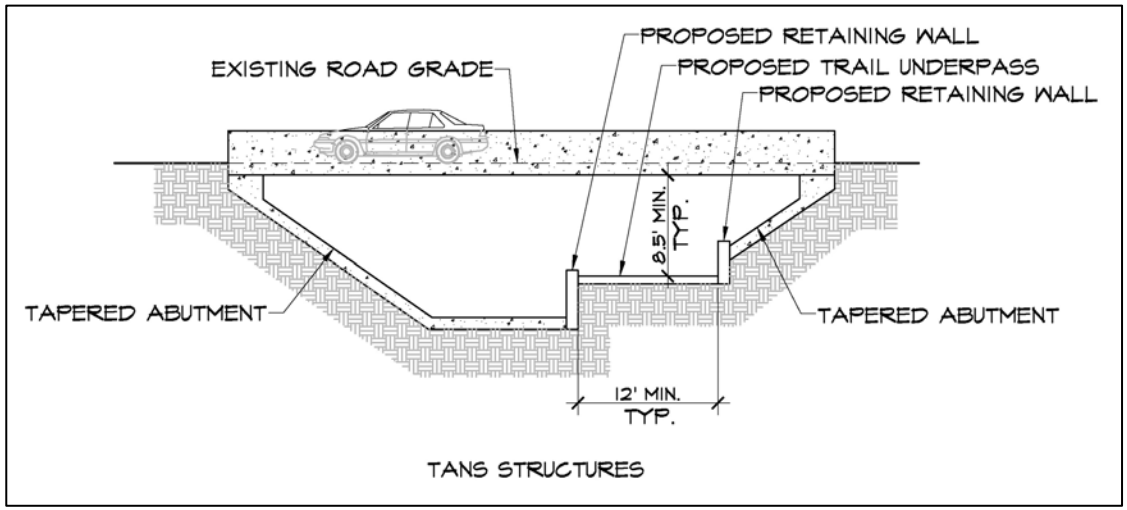


Figure 26 – Typical trail underpass design to a tapered abutment bridge (TANS) structure similar to Kiely Boulevard.

The lands along the west bank south of The Gallery vary in width from adequate to inadequate pinch points where the creek has eroded the bank. This area is also well vegetated with coast live oak trees. The west bank serve as a maintenance access road for servicing utilities limiting the need for vegetation removal *(See Map 10 – Saratoga Creek – Section 2: El Camino Real to Forbes Avenue Conceptual Trail Alignments Map)*.

A trail underpass may be feasible at Homestead Road. This underpass is constrained by very limited land availability on the southeast corner of Homestead Road to support the trail ramp proposed to extend to Homeridge Park. In addition, Saratoga Creek passes beneath Homestead Road at a 45-degree angle. Warped wing walls direct flood flow beneath this structure. The bridge soffit is 12' above the bottom of the channel providing some potential for the channel to support a trail underpass, but the hydraulics created by this curved section of the creek and managed by the warped wing wall design may not allow for modification. The northeast corner of the bridge also incorporates a maintenance access ramp to the bottom of the channel. The Homestead Road trail underpass design would need to address this access issue. These constraints are challenging, but not deemed insurmountable.

After passing beneath Homestead Road the trail would extend along the east bank through Homeridge Park. An existing park pathway could be easily modified to support a multiuse trail. Homeridge Park is accessed from Stevenson Street which dead ends at Saratoga Creek. A new pedestrian bridge is proposed to diagonally span the creek at the end of this road right-of-way to connect to the west bank of the creek adjacent to the Calvary Baptist Church on Forbes Avenue. Santa Clara has been negotiating access through this site to support the trail.

The trail will connect to city streets at Forbes Avenue. A trail underpass is not feasible at Forbes Avenue or any of the other upstream roadway crossings. There is also very limited land availability between Forbes Avenue and Stevens Creek Boulevard. Homes, a school and the northbound Lawrence Expressway on-ramp are built to the edge of the creek banks. Improvements would be needed to connect trail users to the existing sidewalk and bicycle route on Forbes Avenue *(See Map 10 – Saratoga Creek – Section 2: El Camino Real to Forbes Avenue Conceptual Trail Alignments Map).*

The pathway at Homeridge Park extends beneath the shade canopy of the riparian trees.

NEXT STEPS

Study Section 2 has a unique set of challenges and opportunities that require further investigation through preliminary design. The next steps to undertake in assessing Study Section 2 include:

1) Prepare preliminary designs and water surface elevation modeling for Kiely Boulevard and Homestead Road trail underpasses for discussion with SCVWD.

2) Continue coordination with The Gallery at Central Park to ensure the trail underpass ramp and pedestrian bridge abutment locations are identified in the site plan.

3) Coordinate with the Central Park Pedestrian and Bicycle Access Project to ensure the Saratoga Creek multiuse trail alignment is integrated into the improvement plans.

4) Develop plans to integrate the trail with the on-street network at Benton Street and Forbes Avenue.

A pedestrian bridge is proposed at the end of Stevenson Street adjacent to Homeridge Park

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The preliminary budget estimates for developing creek trails along Calabazas Creek, Saratoga Creek and Hetch Hetchy corridors are detailed in this chapter. Budget estimates are based upon the preferred alignment and conceptual engineering solutions. The estimates were determined by calculating quantities and applying unit costs to these quantities. The unit costs were developed by looking at range of recently awarded trail construction costs that included pedestrian/bicycle overcrossings and tunnels, trail underpasses, clear span pedestrian/bicycle bridges, trail paving in asphalt and concrete, native landscaping, mitigation and restoration and typical trailside amenities. The construction subtotals are increased by approximately 10% for landscaping and amenities and 18% for design and permitting. The estimates do not include elements that may enhance the visual appeal or user experience, which may include interpretive elements or entry features.

The figures should be viewed as rough estimates to develop functional trails. These estimates would require review through the creek trail master plan and further refinement through construction plans and specifications. Due to the preliminary nature of a feasibility study a 20% project contingency is applied to the corridor totals to capture the uncertainties associated with the conceptual alignments and engineering solutions. A detailed analysis of potential utility relocations is not part of this feasibility study. Utility relocations are captured in the 20% project contingencies and will be further assessed in the trail master plan. Annual cost escalations have not been included in the budget estimates. Trail development costs have reflected the bidding climate experienced over the past decade of financial turmoil. Each study corridor is presented individually.

BUDGET ASSUMPTIONS

The budget estimates reflect current trail design standards including Caltrans Highway Manual, ADA Standards for Accessible Design, Santa Clara County Uniform Inter-jurisdictional Trail Design, Use and Management Guidelines and Valley Transportation Authority Bicycle Technical Guidelines. The budget estimates are based on a 12-foot wide trail with an asphalt surface. In some areas, a pervious trail surface that supports rainwater infiltration may be desirable, but has not been included in these estimates.

Overcrossings, tunnels, underpasses and pedestrian/bicycle bridges are based on a 10-foot wide trail. In many instances, the constrained areas that require these structures will support only the 10-foot width due to limited land availability or cross-sectional area of a creek channel needed to pass high storm flows. Ramps to these grade-separated structures are based upon 5% grade. Trail segments that are proposed below the top of bank are estimated as poured concrete structures.

These estimates are for standard materials that fulfill the functional requirements of the design. Different construction materials may be selected during design. The selection of unique materials may alter budget estimates. The estimates do not reflect possible cost increases associated with sea level rise along the two creek corridors.

BUDGET ESTIMATE SUMMARY

The preliminary design and construction cost for completing the Calabazas Creek Trail is estimated to be $23,435,000. The preliminary design and construction cost for completing the Hetch Hetchy Trail is estimated to be $6,560,000. The preliminary design and construction cost for completing the Saratoga Creek Trail is estimated to be $5,375,000. These estimates include design fees, engineered structures, trail surfacing, native plant landscaping and trail amenities. Estimates are not provided for trail alignment alternatives, land acquisitions or easements. Itemized budget estimates for each corridor are provided in Figures 27-29.

PRELIMINARY COST ESTIMATE – CALABAZAS CREEK CORRIDOR

Study Section 1 – San Francisco Bay Trail to Highway 101		
Highway 237 Underpass and Ramps (550 feet)	$	200,000
Old Mountain View-Alviso Road – Bridge Reconstruction (underway)	$	----------
Tasman Drive Underpass and Ramps (560 feet)	$	250,000
Highway 101 Pedestrian/Bicycle Overcrossing (1,500 feet)	$	4,000,000
Paving (5,860 feet)	$	705,000
Section 1 Subtotal	**$**	**5,155,000**
Study Section 2 – Highway 101 to Monroe Street		
Scott Boulevard Underpass and Ramps (590 feet)	$	600,000
Pedestrian/Bicycle Bridge (60 feet)	$	250,000
Central Expressway Pedestrian/Bicycle Overcrossing (1,400 feet)	$	3,000,000
Kifer Road Underpass and Ramps (510 feet)	$	500,000
Caltrain Tunnel (600 feet)	$	4,000,000
Pedestrian/Bicycle Bridge (60 feet)	$	250,000
Monroe Street Intersection Improvements	$	90,000
Paving (5,030 feet)	$	605,000
Section 2 Subtotal	**$**	**9,295,000**
Study Section 3 – Monroe Street to Lochinvar Avenue		
Calabazas Boulevard Bikeway Improvements (underway)	$	--------
Pomeroy Avenue Intersection Improvements	$	90,000
Pedestrian/Bicycle Bridge (55 feet)	$	250,000
Paving (2,125 feet)	$	255,000
Section 3 Subtotal	**$**	**595,000**
Subtotal	**$**	**15,045,000**
Landscaping and Amenities 10%	$	1,505,000
Construction Subtotal	**$**	**16,550,000**
Design and Permitting 18%	$	2,980,000
Design and Construction Subtotal	**$**	**19,530,000**
Project Contingency 20%	$	3,905,000
Calabazas Creek Trail Total	**$**	**23,435,000**

Figure 27 – Calabazas Creek Trail Construction Budget Estimate

Illustration 3 – View from the Bridge Deck on the Highway 101 Pedestrian Overcrossing

PRELIMINARY COST ESTIMATE – HETCH HETCHY CORRIDOR

Guadalupe River Parkway to Calabazas Creek Trail		
Lick Mill Boulevard Street Crossing Improvements	$	90,000
UPRR Tunnel (still under study)	$	3,000,000
Great America Theme Park/Stadium Pedestrian/Bicycle Bridge (existing)	$	----------
Great America Parkway Intersection Improvements	$	90,000
Old Ironsides Intersection Improvements	$	90,000
Patrick Henry Drive Street Crossing Improvements	$	30,000
Paving (7,535 feet)	$	905,000
Subtotal	**$**	**4,205,000**
Landscaping and Amenities 10%	$	420,000
Construction Subtotal	**$**	**4,625,000**
Design and Permitting 18%	$	835,000
Design and Construction Subtotal	**$**	**5,460,000**
Project Contingency 20%	$	1,100,000
Hetch Hetchy Trail Total	**$**	**6,560,000**

Figure 28 – Hetch Hetchy Trail Construction Budget Estimate

PRELIMINARY COST ESTIMATE – SARATOGA CREEK CORRIDOR

Study Section 1 – Monroe Staging Area to El Camino Real		
Cabrillo Avenue Street Crossing Improvements	$	30,000
Paving (815 feet)	$	100,000
Section 1 Subtotal	**$**	**130,000**
Study Section 2 – El Camino Real to Forbes Avenue		
Kiely Boulevard – Bridge Reconstruction with Trail Underpass	$	1,750,000
Pedestrian/Bicycle Bridge between Kiely and Homestead (56 feet)	$	250,000
Homestead Road Underpass and Ramps (455 feet)	$	500,000
Pedestrian/Bicycle Bridge at Stevenson Street (150 feet)	$	350,000
Paving (3,925 feet)	$	470,000
Section 2 Subtotal	**$**	**3,320,000**
Subtotal	**$**	**3,450,000**
Landscaping and Amenities 10%	$	345,000
Construction Subtotal	**$**	**3,795,000**
Design and Permitting 18%	$	683,000
Design and Construction Subtotal	**$**	**4,478,000**
Project Contingency 20%	$	897,000
Saratoga Creek Trail Total	**$**	**5,375,000**

Figure 29 – Saratoga Creek Trail Construction Budget Estimate

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AGENCIES CONTACTED

San Francisco Public Utilities Commission

Joanne Wilson
Senior Land & Resources Planner

Kendrick Li, Attorney
Real Estate Division

Brian Morelli, Right of Way Manager

Sally Morgan
Environmental Project Manager

San Mateo County Transit District

Brian Fitzpatrick, Manager
Real Estate & Property Development

Gary Cardona
Senior Real Estate Officer

Kevin Boles
Construction Manager

Santa Clara Valley Water District

Sue Tippets, Director
Community Projects Review Unit

Usha Chatwani
Associate Civil Engineer
Community Projects Review Unit

Ben Davis, Assistant Engineer
Community Projects Review Unit

City of Sunnyvale

Jack Witthaus
Transportation and Traffic Manager

Surachita Bose
Associate Planner

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