



Countywide Bicycle Plan

May 2018
Final Plan



Santa Clara Valley
Transportation
Authority

Solutions that move you

Santa Clara Countywide Bicycle Plan

Final Draft

May 2018





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1. Forward

We all know bicycling is a fun, healthy, green way to get around. People of all ages are hopping on a bike to commute to work, run errands, ride to school, or catch a train. In Santa Clara County, bicycling is a viable year-round transportation solution. Over the last decade, we have seen a steady increase in bicycling and strong public support for better bikeways.

VTA, the cities and the County play a large role in this shift toward bicycling:

- There are now over 800 miles of bikeways in the county.
- The network includes nearly 200 miles of bicycle paths that are entirely separated from motor vehicle traffic.
- In the last ten years, agencies have reconfigured nine freeway interchanges to provide better bicycle access and constructed several new bicycle bridges to open up new areas for bicycling.



Our Vision

VTA is looking to the future and setting a course for what bicycle travel can be like ten years from now. Our vision: **Santa Clara County will be served by a countywide bicycle network that is safe, convenient, and connected, enabling people of all ages and abilities to easily bike to work, school, shopping, transit, and elsewhere.**

In practice, this means a future where we are all able to:

- Bike to work, school, shopping, and errands on attractive, European-style bikeways, separated from cars, and shared by people of all ages
- Cross freeways, rail lines, and creeks easily and safely
- Ride from one city to the next on safe, continuous bicycle lanes and paths
- Easily find our way with simple directional signs, consistent design, and useful maps and apps
- Park securely at Caltrain, BART, and VTA light rail stations and take our bike on the bus or train every time we need to

Ultimately, the bike network should become so useful and important it becomes part of people's mental map of Santa Clara County, on par with major roads, freeways, Expressways, and rail lines.

The Santa Clara Countywide Bicycle Plan realizes this vision by planning a connected network of approximately **950 miles of Cross County Bicycle Corridors**, including **ten bicycle superhighways**, **280 new and improved bicycle connections across**



barriers, and a countywide effort to provide **bicycle education and encouragement programs**.

Our Commitment

VTA, the cities, and the County will continue to work together to make bicycling a convenient choice for more and more people.

- We will use the same care and planning afforded the roadway network when planning the countywide bikeway network.
- We will design bikeways that are open 24 hours a day, seven days a week, interconnected, of consistent high quality, and easy to navigate.
- We will seek inspiration from regions that have “gotten bicycling right” – like Copenhagen, Denmark; Bogotá, Colombia; and Canberra, Australia—and support efforts to customize innovations to our local cultures and conditions.

To make this vision a reality, it will require support from multiple partners:

Local elected officials, to set priorities for local communities to support safe bicycling for all,

Local transportation and public works staff, to design and deliver many of the projects in this plan and to address bicycle-supportive models, metrics and standards,

Bicycle and Pedestrian Advisory Committee members, to advise local elected officials and city staff on the importance of delivering bicycle infrastructure and education programs,

Major employers and developers, to support bicycling through commuter incentive programs and monetary contributions to build improved bicycle infrastructure,

Members of the public, including parents, teachers, students, seniors, drivers, and non-drivers to support improved bikeways and education and encouragement programs in their communities,

Local law enforcement, who can support education and enforcement that improves bicyclist safety and driver and bicyclist behavior, and

Local advocacy groups, who can generate enthusiasm and continue to push for better bikeways

Finally, VTA plays a large role in delivering the Countywide Bicycle Plan. This plan establishes a vision and inspiration for the future of bicycling in Santa Clara County. We must now communicate the plan’s vision and collaborate with Member Agencies and others who will ultimately build and implement most of the plan recommendations. Our policy and funding decisions should support the projects and programs identified in this plan. We will lead the effort to deliver regionally significant bicycle projects and programs.

Given the successes VTA and its Member Agencies have had in the last decade, imagine what we will see in the next ten years.

2. Introduction

While most people first think of VTA as the operator of Santa Clara County's bus and light rail system, it is not the only aspect of our work. VTA is truly a multimodal transportation solutions agency with wide-ranging authority. VTA's responsibilities encompass transit development and operations, congestion management, funding, highway design and construction, real estate and transit-oriented development, and bicycle and pedestrian planning.

The Countywide Bicycle Plan is an important part of the work VTA does. It describes a vision for a countywide network of connected, high quality bikeways. It supports our role as a Congestion Management Agency by encouraging bicycling as an alternative to driving. It complements our role as a transit agency by laying out our commitments to accommodate bicyclists

on transit and support first-last mile access. Finally, it provides the implementation details needed to meet the multi-modal goals we outline in our 25-year transportation plan, the Valley Transportation Plan.

The bicycle plan focuses on countywide bicycle planning. However, it should always be viewed within the context of VTA as a multimodal transportation solutions provider delivering solutions that keep Silicon Valley moving.

Bicycling in Silicon Valley

Much has changed since VTA last updated the Countywide Bicycle Plan in 2008. Bicycling has become more mainstream. More people from more communities are asking for better bikeways.



*Bicyclist on Fourth Street cycle track near San Jose State University
Photo: Sergio Ruiz*



*People of all ages want to bicycle.
Photo: Richard Masoner*

Large employers are supporting bicycling and working with local agencies to fund, design, and build better bikeways. Parents, school administrators, and local law enforcement in more communities are coming together to teach students how to bike safely.

Bicycle culture is blossoming, with bicycle-related events ranging from informal bicycle rides to large events attracting thousands of participants.

Transportation agencies, including Caltrans, are updating their design guidance to permit and encourage new bikeway designs like cycle tracks, green paint, and bicycle signals. Some agencies, including VTA, are looking even farther ahead, to understand how innovations like electric bicycles, dockless bike share, automatic vehicles, connected streets, big data, and mobile apps can improve safety and facilitate bicycling.

People of all ages want to bicycle, and they need safe, comfortable, connected bikeways to do so. Comfort should not end at city boundaries, and bikeways should not stop at freeway sound walls. People need bikeways to get them where they need to go—to work, to

school, to shop, to transit. People want bicycling to be a fun activity, where they can talk with their coworker, their son or daughter, or their neighbor as they ride.

Countywide Bicycle Plan

VTA is responding to this cultural and institutional shift. With this update of the Bicycle Plan, we are leading a countywide vision for a safe, convenient, and connected network of bikeways that become an important part of people's mental map of Santa Clara County. New tools, education campaigns, events, technologies, and innovations will support this network.

The Countywide Bicycle Plan describes:

A network of **Cross County Bicycle Corridors (CCBCs)** that connect all jurisdictions and provide access to jobs, schools, transit, recreation, services, and homes. Within this network, VTA has identified approximately 350 miles of **priority CCBCs**, and ten corridors for potential **bicycle superhighways**. The CCBC network will provide an exemplary, uniform, and memorable bicycling experience.

Thirty-nine priority locations where **gap closure projects** or **new bicycle bridges and tunnels** can dramatically improve bicycle access and create new connections across barriers.

Innovative solutions to bicycle mobility, such as a multi-modal trip planning app, trailside amenities, GPS-enabled trail reporting system, luminescent bicycle paths, and pop-up bikeways.

Improved connections between bicyclists and transit, including the



BART stations opening in Milpitas and San Jose. Strategies consist of new bikeways, expanded and enhanced bicycle parking, expanded on-board bicycle storage, and information systems to facilitate bicycle-transit connections.

Countywide **bicycle education and encouragement programs** that will make bicycling even more mainstream. These include VTA's first large-scale foray into countywide education and encouragement programs, in collaboration with the County Department of Public Health.

How new bikeways and bicycle programs **will serve the entire Santa Clara community**. Outreach for the plan targeted non-bicyclists and residents from traditionally underserved neighborhoods within the County. The cross county network and the planned programs supporting it were developed to be inclusive and inviting to a diverse cross-section of residents.

Partners

We can't reach our vision alone. Our partnerships with VTA's Member Agencies—the 15 cities within Santa Clara County and the County— as well as nonprofit organizations, businesses, other county agencies, and regional agencies are imperative to our success. This plan describes how VTA will work with and support its partners to implement the plan's vision and recommendations.

We developed this plan in collaboration with our partners and the community. Recommendations draw from conversations with city and County staff, community members and nonprofits. We sought the advice and input of VTA's

various advisory committees, including our Bicycle and Pedestrian Advisory Committee, at key decision points.

The Countywide Bicycle Plan also relies on the strong previous planning efforts of our partners. The plan reflects priorities in local, countywide, and regional bicycle plans. At the same time, it provides a countywide structure for local plans and identifies potential coordination opportunities.

What's New in This Plan?

This plan updates VTA's 2008 Countywide Bicycle Plan. It incorporates several new approaches and changes:

- Expands the network of CCBCs to include low-stress bikeways.
- Describes a vision of ten connected bicycle superhighways—CCBCs that provide low-friction, long distance, unbroken bicycle travel, separated from motorists.
- Updates the list of Across Barrier Connections (ABCs) to reflect completed projects and changing situations.
- Prioritizes CCBCs and ABCs using criteria approved by the VTA Board of Directors.
- Sets VTA's design expectations for the CCBCs.
- Expands recommendations to encompass innovative, cutting-edge solutions.
- Describes VTA's role in implementing the capital projects and education encouragement programs.
- Takes an equity-based approach that includes multi-lingual outreach to diverse communities across the County.



Plan Contents

Chapter 1, Forward, describes the plan vision and VTA's commitment.

Chapter 2, Introduction, places the plan in the larger context of VTA's countywide transportation planning and recent changes in bicycle culture. It provides an overview of plan chapters.

Chapter 3, Vision, Goals, and Policies, describes the Countywide Bicycle Plan's vision, goals, and supporting policies. The plan builds from four key goals: a comprehensive and continuous network; safety and convenience; innovation; and transit connectivity.

Chapter 4, Current Bicycling Conditions and Setting, reviews existing bicycling conditions within Santa Clara County, including public sentiment regarding bicycling, public agency support for bicycling, current bicycle infrastructure and connectivity, bicycling rates, bicycle connections to transit, and bicycle safety.

Chapter 5, Cross County Bicycle Corridors, describes the concept of CCBCs and outlines the methodology for updating CCBCs and prioritizing projects. It also describes design expectations for CCBCs and showcases five demonstration projects.

Chapter 6, Across Barrier Connections, describes the concept of ABCs, summarizes their status, and outlines the methodology for prioritizing ABCs.

Chapter 7, Education and Encouragement Programs, presents ongoing and potential future bicycle education and encouragement programs. For each program, the chapter indicates VTA's role as funder,

manager, or support. The chapter sets the framework for a future countywide education and encouragement program.

Chapter 8, Cost, Funding and Implementation, summarizes the strategy for implementing the Countywide Bicycle Plan. It outlines roles for VTA and other stakeholders and includes implementing actions and metrics to measure progress.

The following appendices support the plan:

Appendix 3.1 Planning and Policy Context

Appendix 4.1 Public and Stakeholder Input

Appendix 4.2 Level of Traffic Stress Methodology

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3. Vision, Goals, and Policies

Vision

The Countywide Bicycle Plan envisions a future where:

Santa Clara County is served by a countywide bicycle network that is safe, convenient, and connected, enabling people of all ages and abilities to easily bike to work, school, shopping, transit, and elsewhere.

This vision demands high-quality, connected bikeways that provide safety from motorized vehicles. It requires innovative, cutting-edge solutions to overcome the challenges of retrofitting our built-out communities to support bicycling. It requires fostering a culture where bicycling is a typical and readily accepted way for people to travel.

To enact this vision and establish bicycling as a viable way to travel in the County, Santa Clara County's bicycle infrastructure must be:

- Comprehensive and Continuous
- Safe and Convenient
- Innovative
- Connected to Transit

This chapter outlines these goals and supporting policies.

Relationship to the Strategic Plan

VTA's five-year Strategic Plan, adopted in 2017, describes VTA's Mission, Vision, and Action Values. The vision, goals, policies, and implementing actions for the Countywide Bicycle Plan support the Strategic Plan.

VTA's overarching mission is to "provide solutions that move you" and the vision is to "innovate the way Silicon Valley moves." Recognizing that bicycling is a potential solution for many, the Countywide Bicycle Plan maps out Cross County Bicycle Corridors (CCBCs). It identifies major barriers to bicycle connectivity and potential solutions. It looks beyond basic solutions to include innovations in education, encouragement, technology, funding and delivery.

In line with the Strategic Plan's action values, the Countywide Bicycle Plan aims to establish VTA as a creative countywide leader in bicycle planning, one that delivers innovative solutions in close collaboration with Member Agencies and other stakeholders.

Goals and Policies

The goals and policies from the 2008 Bicycle Plan have been reorganized to better support VTA's Strategic Plan. They have also been updated to reflect changes to the practice of bicycle planning, including recent efforts to promote active transportation and public health, to reduce severe and fatal traffic collisions, and to address climate change.

Even with these changes, many of the policies presented here are directly carried over from the 2008 Countywide Bicycle Plan. The 2008 policies were developed in close collaboration with the VTA Bicycle and Pedestrian Advisory Committee. Each policy is supported by implementing actions. **Chapter 8** describes specific actions VTA will take to implement the policies.

Goal 1. Develop a Comprehensive and Continuous Countywide Bicycle Network

A comprehensive and continuous countywide bicycle network should provide connections to key destinations, provide unbroken, high quality, low-stress bikeways, and reach most areas of the county.

Connected bicycle infrastructure is essential to encourage people to bicycle. Connected networks should not only provide adequate density of bikeways, but also must create links between residential areas, employment, transit, schools, parks, and other major destinations. Connected networks must provide frequent, safe crossings of major barriers—railroad tracks, freeways, creeks.

Bikeway design should reduce the stress of riding with or crossing motor vehicle traffic. While many residential neighborhoods in Santa Clara County have quiet streets that are comfortable for most bicyclists, these neighborhoods are not connected. Often, to bike to a destination, people must cross high-stress arterials, expressways, or freeway interchanges.

The Countywide Bike Plan seeks to solve these problems by defining a network of long-distance CCBCs that link residential areas with major destinations. The plan also identifies spots where new or improved crossings are needed—Across Barrier Connections (ABCs).

The following policies support the goal of developing a comprehensive and continuous countywide bicycle network:

Policy 1A: Expand the Network: VTA will support construction of CCBCs and

ABCs throughout the county, both as stand-alone projects and as part of related transportation projects.

Policy 1B: Leverage Development to Build Bicycle Infrastructure: VTA will work with Member Agencies to ensure existing and new development supports bicycling.

Policy 1C: Seek Adequate Funding: VTA will work with Member Agencies, and regional, state, and federal agencies to identify and secure funding for bicycling projects and programs within Santa Clara County.

Goal 2. Ensure that Bicycling is Safe and Convenient for All

For short trips (typically under four miles), bicycling should be as convenient as or more convenient than other modes of travel in terms of time, money, and effort. Trips should be as direct as possible, secure parking should be located at important destinations, and amenities, such as changing rooms and showers, should be provided at workplaces.

When bicycling, people should feel safe from cars and crime. People of all ages, abilities, and backgrounds should feel comfortable bicycling in their neighborhoods.

Especially in recent years, VTA and its Member Agencies have looked for ways to improve bicyclists' safety and comfort through new and better bikeways and programs such as Safe Routes to School and Bike to Work Day. Agencies are pursuing Vision Zero programs to eliminate all traffic fatalities, and making efforts to reach out to people who aren't typically involved in planning and design of bikeways. These efforts are still needed. Concerns about traffic continue

to be a major barrier to biking, and nearly 800 bicyclists per year are injured in traffic collisions in the county.

The following policies support the goal of ensuring that bicycling is safe and convenient for all:

Policy 2A: Improve Quality of Bicycle Infrastructure: VTA will support a bicycle network that accommodates all bicyclists and incorporates advancements in bicycle infrastructure.

Policy 2B: Ensure the Network is Easy to Find and Use: VTA will work to ensure it is easy to navigate by bicycle along CCBCs using uniform wayfinding tools such as signs, on-street markings, kiosks, maps, and apps in the locally-spoken languages.

Policy 2C: Support Bicyclist Safety and Traffic Laws: VTA will encourage Member Agencies to enforce equitably traffic laws related to bicyclist safety and to improve driver education.

Policy 2D: Promote Bicycle Education: VTA will promote bicycle education programs for all age groups and in all languages in common use in the County.

Policy 2E: Encourage Bicycling: VTA will work with local stakeholders to encourage bicycling within Santa Clara County.

Goal 3. Pursue Innovative Solutions

To address the bicycling challenges we face today and will face tomorrow, VTA and Member Agencies must be creative and innovative, identifying solutions that will suit community needs. This means deeply understanding the community's current needs, embracing change, and finding the best tool for the job, be it new

technology or traditional methods repurposed for new situations.

The following policies support the goal of pursuing innovative solutions:

Policy 3A: Implement Best Practices in Design: VTA will work with Member Agencies to ensure that bicycle facility designs meet local, state, and national best practices.

Policy 3B: Support Ongoing Maintenance: VTA will support Member Agency maintenance programs to ensure existing and constructed bicycle facilities remain safe and navigable.

Policy 3C: Plan for the Future of Bicycling: VTA will keep abreast of, plan for, and embrace the latest developments in transportation technology, including e-bikes, automated vehicles, big data, and the internet of things.

Goal 4. Improve Transit Connectivity

Bicycling provides a critical first-mile/last-mile connection to and from transit. Major transit stops in Santa Clara County should be served seamlessly by high-quality bikeways. It should be easy to bicycle to all rail stations and major bus lines. Transit vehicles should provide ample bicycle accommodations for bicycles, and rail stations and transit centers should have adequate secure bicycle parking.

To support the bicycle-transit link, VTA will need to work with Member Agencies to make local improvements. VTA will also continue to ensure safe interactions between bicyclists and transit vehicles, through infrastructure, operator training, and safety campaigns.

The following policies support the goal of improving transit connectivity:

Policy 4A: Improve Bicycle Access to Transit: VTA will link bicycle and transit routes by funding and constructing transit-connected bikeways.

Policy 4B: Provide Consistent Bicycle Parking at Transit Stations: VTA will work with local transit agencies to ensure the presence of sufficient secure bicycle parking at transit stops throughout the county.

Policy 4C: Support Safe and Convenient Bicycle/Transit Interactions: VTA will work with its operators and Member Agencies to support safe and convenient interactions between bicyclists and transit vehicles. This includes providing adequate bicycle storage on-board transit vehicles.

Relationship to Other Plans and Policies

The Countywide Bicycle Plan's goals and policies support national, state, and regional plans and policies that view bicycling as a safe, convenient, healthy, and environmentally friendly transportation option. Specifically:

US Department of Transportation encourages transportation agencies to fully integrate active transportation, including bicycling, into projects, as set forth in the agency's 2010 "Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations."

Caltrans' five-year Strategic Management Plan (2015) established a statewide goal of tripling bicycling by

2020. Caltrans statewide bicycle and pedestrian plan, Toward an Active California, and Caltrans' District 4 Bicycle Plan adopted the same goal.

The California Legislature, through AB 32 and SB 375, has set greenhouse gas emissions reduction targets at 28 percent of 1990 levels by 2020 and 50 percent by 2050. Shifting motor vehicle trips to bicycle trips helps meet this goal.

The Metropolitan Transportation Commission's Plan Bay Area 2040 has set two goals that are supported by the Countywide Bicycle Plan: 1) reduce per capita CO2 emissions from vehicles and light trucks by 15% by 2040; and 2) Increase non-auto mode share by 10%.

The Federal Highway Administration, California Department of Transportation, the Metropolitan Transportation Commission, and many local jurisdictions have adopted complete Streets policies, which encourage agencies to integrate bicycle, pedestrian, and transit infrastructure into all transportation projects. In December 2017, VTA adopted a Complete Streets policy that applies to all transportation-related capital projects administered by the agency.¹

The Countywide Bicycle Plan also supports the goals and program laid out in VTA's long-range transportation plan, the Valley Transportation Plan (VTP). The VTP establishes a list of transportation projects to deliver over the next 30 years, given anticipated funding. It includes bicycle and pedestrian projects, in addition to transit, highway, local road and intelligent transportation system projects.

¹ <http://www.vta.org/projects-and-programs/complete-streets>

VTA updates the VTP every four years. Future updates will incorporate some of the projects and programs identified in the Countywide Bicycle Plan.

Finally, while the Countywide Bicycle Plan is a focus for VTA, local bicycle plans are the focus of the jurisdictions. VTA's plan provides general guidance on countywide bicycle infrastructure and programming, and it includes a subset of routes on local roads within the County. However, local plans include specific design recommendations and focus on implementation.

Further description of these and other plans and policies are provided in **Appendix 3.1**.



4. Current Bicycling Conditions and Setting

Conditions for bicycling in Santa Clara County are improving. More people are biking to work and to school. Cities have built new bicycle lanes, bicycle paths, and bicycle bridges. Many communities have strong Safe Routes to School programs, and thousands of people participate in bicycle events such as Bike to Work Day and Viva CalleSJ. VTA and Caltrain are increasing bicycle parking on buses and trains. Employers and developers recognize the value of bicycling and are funding new bicycle infrastructure for communities.

At the same time, many challenges to comfortable cross-county bicycling remain. Santa Clara County was built to serve the automobile. As a result, land uses are separate, destinations are far apart, and major arterials are often the only way to travel from one neighborhood to another. Bikeways stop and start, and dead-end at major barriers. Bikeways do not always connect across jurisdictional boundaries. Heavy congestion on arterials makes it difficult to reallocate roadway space to bicyclists. Many of the easier bikeways have been built, leaving the more expensive, difficult segments.

This chapter presents a snapshot of current bicycling conditions in Santa Clara County. The opportunities and challenges described here guided us in developing proposed projects and education/ encouragement programs. This chapter also sets a baseline against which we can measure progress over time.

This chapter describes:

- Public sentiment related to bicycling,
- Member Agency support for bicycling,

- Bicycle ridership trends,
- Bicycle infrastructure,
- Bicycles and transit, and
- Bicycle safety.

Public Sentiment Regarding Bicycling

During development of this plan, VTA held a series of community workshops, hosted an interactive web map, communicated via social media, and attended other outreach events. Over 700 people shared their ideas. **Appendix 4.1** summarizes outreach efforts and findings. Outreach aimed to engage all residents, regardless of whether they bicycle, including persons with limited English proficiency and historically underserved communities.

Many common themes emerged from this outreach. VTA updated the Cross County Bicycle Corridors and education and encouragement programs to respond to these themes:

Safety concerns are the biggest barrier to bicycling. Participants consistently stated that they avoid bicycling through areas where they feel unsafe from motor vehicle traffic.

Crossings are particularly concerning. Participants identified over 200 locations as a “dangerous/difficult crossing” due to high vehicle speeds, high vehicle volumes, or lack of bicycle facilities.

Gaps in bicycle facilities are strong deterrents to bicycling. Participants specifically mentioned freeway interchanges and other places where a bicycle facility abruptly ends.



Low-stress bicycle facilities are desired. Participants prefer bicycle paths or riding on side streets with low traffic volumes over riding on arterials with high traffic volumes.

Network connections are essential to a high-functioning bicycle system.

Participants requested connections to trails, transit hubs, employment centers, schools, public buildings, and parks. Specific locations for new and improved connections include:

- Access to Berryessa BART
- Connections to East San Jose
- Completion of the Coyote Creek Trail and Guadalupe River Trail
- North-south connections in east and central Santa Clara County.

Participants frequently requested several **bicycle infrastructure improvements**, including:

- More trail lighting
- Better accommodations at signalized intersections (e.g. bicycle detection)
- Better access and improved signage to bicycle paths
- More frequent maintenance.

People want more space to store **bicycles on transit vehicles.**

Community members are **wary of letting their children bicycle** because they are concerned for safety.

Secure bicycle parking is critical for encouraging bicycling.

Member Agency Support for Bicycling

VTA's Member Agencies support safe bicycling through both infrastructure

projects and non-infrastructure programs, including education, encouragement, enforcement, and engagement activities. Even so, the capacity for planning and delivering bicycle capital projects and education/encouragement programs varies by Member Agency. VTA considered this information when developing the implementation plan for the Countywide Bicycle Plan.

Local Bicycle Plans

Nearly all jurisdictions have adopted and updated bicycle master plans in recent years. As of November 2017, 13 of the 16 Member Agencies have standalone bicycle plans. The agencies without standalone bicycle plans all address bicycle planning in the Transportation Element of their General Plan. (See **Table 4-1.**)

Ideally, local plans should consider four key elements of bicycle planning:

- **Engineering:** improved bicycle infrastructure.
- **Encouragement:** programs or events such as Bike to Work Day, that encourage bicycling.
- **Education:** courses and campaigns that improve bicycle safety and driver awareness of bicyclists.
- **Enforcement:** protocols for bicyclists and drivers to limit on-the-road conflicts.

These elements are addressed to varying degrees in city bicycle plans in Santa Clara County.



Table 4-1: Santa Clara County Local Bicycle Plans

Jurisdiction	Bicycle Plan	Engineering	Encouragement	Education	Enforcement
Campbell	Campbell General Plan (Land Use and Transportation Chapter) (2001)/ Update (2014)	•			
Cupertino	Cupertino Bicycle Plan (2011)/ Update (2015)	•	•	•	•
Gilroy	Gilroy Bicycle and Pedestrian Plan (2002)	•	•	•	
Los Altos	Los Altos Bicycle Plan (2012)	•	•	•	•
Los Altos Hills	Los Altos Hills General Plan (Pathways Chapter) (2008)	•			
Los Gatos	Los Gatos/Monte Sereno Bicycle and Pedestrian Master Plan (2017)	•	•	•	•
Milpitas	Milpitas Bicycle Plan Update (2009)	•	•	•	•
Monte Sereno	Los Gatos/Monte Sereno Bicycle and Pedestrian Master Plan (2017)	•	•	•	•
Morgan Hill	Morgan Hill Bikeways, Trails, Parks and Recreation Master Plan (2017)	•	•	•	•
Mountain View	Mountain View Bicycle Plan (2015)	•	•	•	•
Palo Alto	Palo Alto Bicycle and Pedestrian Plan (2012)	•	•	•	•
San Jose	San Jose Bicycle Plan (2009) (Update scheduled for 2018) San Jose Vision Zero Plan (2015)	•	•	•	•
Santa Clara	Santa Clara Bicycle Plan Update (2009)	•	•	•	•
Santa Clara County	Santa Clara County Parks and Recreation Department, Countywide Trails Master Plan (1995); Gaps Analysis (2015)	•			
	Roads and Airports Department, Draft Circulation and Mobility Element – includes plans for bikeways along selected county roads				
Saratoga	City of Saratoga Circulation and Scenic Highway Element (2010)	•		•	
Sunnyvale	Sunnyvale Bicycle Plan (2006) (Update scheduled for 2018)	•	•	•	•



Staffing

A handful of jurisdictions in Santa Clara County currently have full-time staff devoted to bicycle and pedestrian projects. These include San Jose, Palo Alto, Cupertino, and Mountain View. The remaining Member Agencies typically assign bicycle and pedestrian duties to one or more staff in the transportation or public works department as a portion of their other duties. As needed, jurisdictions hire consultants to complete bicycle planning tasks.

Most jurisdictions have traffic safety officers. Typically, these officers spend five percent of their time on bicycle safety-related activities. A handful of jurisdictions hold regular coordination meetings with the police department, school administration, and traffic or public works staff to address traffic safety, including bicycle safety.

Funding

Member Agencies use a wide range of local, regional, state, and federal funding sources to implement bicycle projects within their jurisdictions. Many receive funding administered by VTA. In addition, Member Agencies pursue a variety of competitive grants. Occasionally, private companies provide funding to Member Agencies for bicycle infrastructure. Some bicycle projects are built as a condition of new development.

VTA granted funds for 244 bicycle projects between 2008 and 2016, totaling approximately \$114 million or an average of \$14 million per year. **Table 4-2** summarizes project funding by Member Agency. VTA's bicycle and pedestrian funds are distributed through a competitive grant program, rather than by formula.

Table 4-2: VTA Bicycle Program Expenditures by Member Agency (2008-2016)

Member Agency	Funded Projects	Total Funding (\$million)
Campbell	16	\$7.7
Cupertino	6	\$0.5
Gilroy	4	\$2.7
Los Altos	8	\$0.7
Los Altos Hills	4	\$0.9
Los Gatos	5	\$0.2
Milpitas	10	\$1.8
Monte Sereno	2	\$0.01
Morgan Hill	12	\$0.8
Mountain View	14	\$2.5
Palo Alto	14	\$8.3
San Jose	56	\$37.3
Santa Clara	23	\$5.2
Santa Clara County	22	\$22.4
Saratoga	13	\$6.0
Sunnyvale	29	\$8.3
VTA	6	\$8.9
Total	244	\$114

The number of grants a community receives is dependent on whether they submitted an application, the quality of the application, how well the project



meets grant criteria, and the competition during a particular grant cycle.

Maintenance

Member Agencies generally maintain on-street bikeways as part of routine street sweeping and maintenance. Bicycle path maintenance varies by jurisdiction. As examples, Santa Clara County and Campbell manage bicycle path maintenance through their parks and recreation departments. Gilroy reported maintaining bicycle paths monthly, while in Santa Clara and Los Altos, bicycle path maintenance is complaint-driven and completed on an as-needed basis.

Education and Encouragement

Encouragement activities inspire people to try bicycling for the first time or to ride more often. They include Bike to Work and Bike to School days and Bike Month events. In 2016, nearly all Member Agencies hosted energizer stations on Bike to Work Day. Member Agencies also sponsor bike rodeos, themed bicycle rides, family bicycle events, and helmet giveaways. In 2015, San Jose began hosting an open streets event, Viva CalleSJ. The annual event attracts tens of thousands of participants.

Most jurisdictions participate in some form of Safe Routes to School programs. These are delivered through partnerships with local police departments, Silicon Valley Bicycle Coalition, or the County Public Health Department. Bike to school days are celebrated in several jurisdictions. Several cities provide bicycling education courses for public schools. Efforts work, with upwards of 40% of students biking to some schools.



Viva CalleSJ is an annual event put on by the City of San Jose. For a day, several miles of streets are opened to bicyclists, pedestrians, joggers, and others. Tens of thousands of people attend.

Palo Alto schools offer a model comprehensive walking and bicycling education program, with classroom modules for all elementary and middle school students and on-bike training for all third graders.

Chapter 7 provides a longer overview of education and encouragement programs happening in Santa Clara County.

Current Bicycling Trends

Bicycling is on the rise in Santa Clara County. The percentage of residents who commute by bicycle is small but growing. Just under two percent of Santa Clara County residents biked to work in 2015. However, this represents 62 percent growth from 2007.²

² U.S. Census Bureau, American Community Survey 3-Year and 5-Year Estimates, Table B08301: Means of Transportation to Work.



*Bicycle commuting in Santa Clara County has increased in the last decade.
Photo: Richard Masoner*

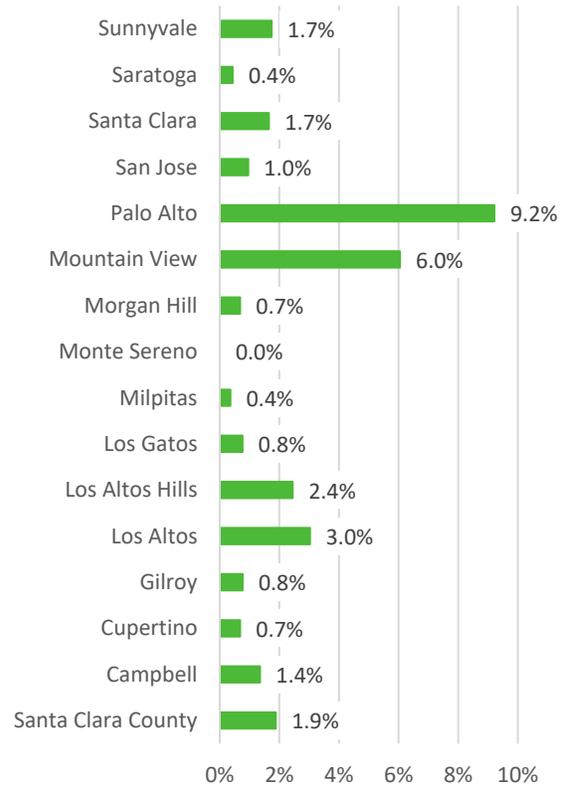
As shown in **Figure 4-1**, bicycle commute rates vary widely by jurisdiction, from as low as under one percent in several cities to as high as 9.2 percent in Palo Alto.³

According to the League of American Bicyclists' 2014 "Where We Ride" report, Palo Alto and Mountain View were among the top 20 bicycle commute cities in the western region. The report also recognized San Jose as one of the top 50 cities where bicycle commuting grew the fastest, with 72 percent growth from 2000 to 2014.⁴

These findings are also supported by bi-annual bicycle counts conducted by VTA through its Congestion Management Program. Every two years, VTA conducts traffic counts of cars and bicycles at major intersections during the evening commute period. During the busiest hour in 2016, approximately 4,000 bicycles were counted at 241 intersections.

³ The US Census is one of multiple data sources for estimating bicycle mode split. Other sources, such as social media, surveys, or bicycle counts as part of VTA's Congestion Management Program, can provide a broader nuanced understanding of commute behavior in the County.

⁴ League of American Bicyclists, Where We Ride (2014).



Source: US Census Bureau

Figure 4-1: Percentage of Workers who Bike to Work, by Place of Residence, in Santa Clara County (2015)

Figure 4-2 illustrates bicycle volumes at count intersections in 2016.

VTA uses bicycle count information and Census commute information to calibrate the VTA travel model. This allows us to more accurately predict future bicycle ridership with planned transportation improvements. The VTA travel model was used to help prioritize projects for the Countywide Bicycle Plan.

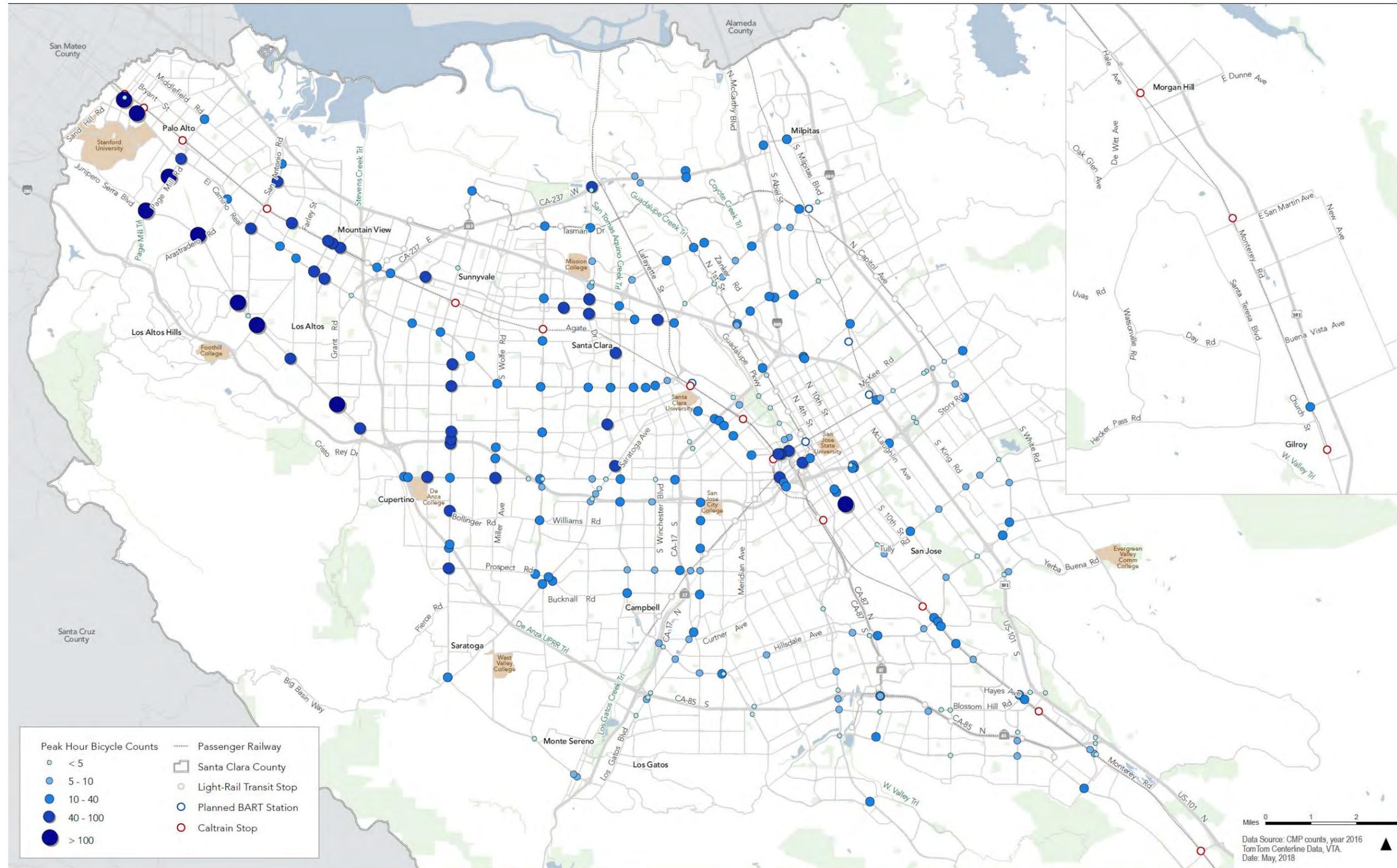


Figure 4-2: Evening Commute Peak Hour Bicycle Counts, 2016

Bicycle Infrastructure

Santa Clara County boasts a robust bicycle path network that serves as the foundation for cross-county bicycling, as well as an expansive bicycle lane network that helps support these trips. The County currently has over 800 miles of bikeways, summarized in **Table 4-3**. More than 80 percent of these bikeways provide bicyclists with dedicated space, separate from motorists. **Figure 4-3** illustrates existing bikeways in Santa Clara County, as of February 2016.

Local jurisdictions have made solid progress building out their bicycle networks, but significant work remains. Key gaps include completing major trails, north-south connections across I-280, east-west connections in south San Jose, connections around Mineta San Jose Airport, east-west connections across I-680, and connections between Milpitas and surrounding communities. The Countywide Bicycle Plan’s CCBCs and ABCs help address these gaps.

Table 4-3: Existing Bicycle Infrastructure by Type in Santa Clara County (2016)

Type of Bicycle Infrastructure	Description	Miles in Santa Clara County
Bicycle Paths (Caltrans Class I)	Completely separated from streets. Provide two-way bicycle travel. Often shared with pedestrians.	195 miles
Cycle Tracks (Caltrans Class IV)	Bicycle lane physically separated from motor vehicle traffic by a vertical barrier, such as an adjacent parking lane, median, or raised curb. May be one-way or two-way. Can be raised or level with auto travel lanes.	2 miles
Bicycle Lanes (Caltrans Class II)	Provide dedicated roadway space for bicyclists, separate from motor vehicle traffic and parking lanes. Designated using striping, pavement markings and signs. Includes standard and buffered bike lanes.	520 miles
Bicycle Routes (Caltrans Class III)	Streets specifically designated for bicyclists to share with motor vehicle traffic.* Designated using signs. Bicyclists ride in the travel lane with motorists or on the shoulder. May include shared lane pavement markings or warning signage. Bicycle boulevards are an enhanced type of bicycle route: low-speed, low-volume streets optimized for bicyclists using traffic calming infrastructure, such as traffic circles.	150 miles (including 12 miles of bicycle boulevards)

*Bicyclists may ride on all local streets, regardless of whether they are designated a bicycle route, unless expressly prohibited.

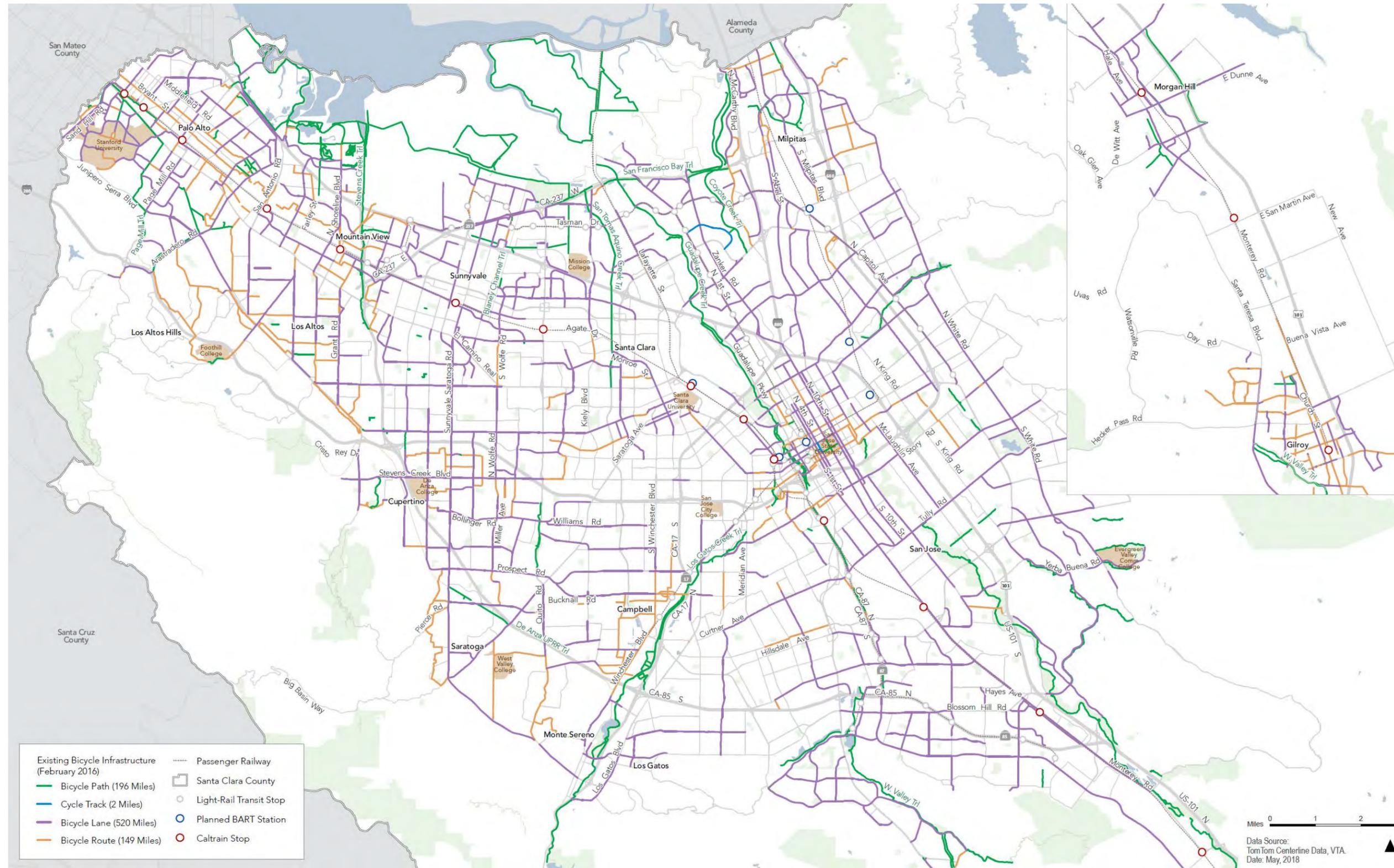


Figure 4-3: Existing Bicycle Infrastructure by Type in Santa Clara County



Bicycle Level of Traffic Stress

Many factors contribute to a person's comfort and perceived safety when bicycling. VTA used Level of Traffic Stress (LTS) analysis to measure the comfort of roads and bikeways in the county. LTS analysis considers the posted speed, number of lanes of traffic, and type of bikeway provided. Streets are graded on a scale, with 1 being the lowest stress, and 4 being the highest stress. **Table 4-4** illustrates LTS ratings. **Appendix 4.2** further describes VTA's LTS analysis.

Just looking at mileage, much of Santa Clara County's existing street and bike path network provide a low-stress, comfortable riding experience for bicyclists. However, these low-stress bikeways are severed by high-stress arterials and physical barriers. **Figure 4-4** shows small islands of low-stress areas. Each continuous, connected low-stress network is shown as a different color. The patchwork illustrates how the county is divided into isolated islands, and lacks a comprehensive and continuous low-stress bicycle network.

Under current conditions, it is difficult to bicycle from one neighborhood to another without meeting a high-stress road. The Countywide Bicycle Plan addresses this problem by establishing a network of Cross County Bicycle Corridors that connect low-stress islands and cross major barriers.

Bike Share

The Metropolitan Transportation Commission, San Francisco Municipal Transportation Authority and VTA launched a publicly funded pilot bike

share program in August 2013. Bike share served communities along the Caltrain corridor. In Santa Clara County, the pilot program operated in three communities—San Jose, Mountain View, and Palo Alto—with 225 bicycles and 28 stations. In its pilot phase, bike share in Santa Clara County saw an average of 2,360 trips per month.⁵

The pilot program was replaced in 2016 when Ford Motor Company announced it would be the title sponsor for a rebranded and expanded bike share system. Ford GoBike will expand bike share to 7,000 bicycles in San Jose, San Francisco, Oakland, Berkeley, and Emeryville. As of March 2018, there are 45 bike share stations in San Jose. By the end of 2018, the system will expand to 85 stations and 200 dockless bikes.

Palo Alto and Mountain View were not included in the expansion of Ford GoBike. These cities and several other Member Agencies are exploring the feasibility of bike share. Of interest are dockless bike share technology and electric bicycles. Dockless bike share uses GPS, smart bikes, and an app to permit customers to rent a bike from anywhere and lock it up anywhere. The flexibility of dockless bike share and the expanded range of electric bikes may increase bike share use in suburban environments. In March 2018, Mountain View launched a one-year pilot program to enable bike share operators to obtain permits from the City to provide up to 800 dockless bikes.

In addition, a number of corporate employment centers in the county provide public or private bike share for their employees and surrounding users.

⁵ Based on Bay Area Bike Share data summarized in Mountain View staff memo, dated May 17, 2016.

Table 4-4: Bicycle Level of Traffic Stress Classifications

Level of Traffic Stress	Description	Example
<p>Level of Traffic Stress 1</p>	<p>Most children feel comfortable bicycling.</p>	
<p>Level of Traffic Stress 2</p>	<p>The mainstream adult population feels comfortable bicycling.</p>	
<p>Level of Traffic Stress 3</p>	<p>Bicyclists who are considered “enthused and confident” but still prefer having their own dedicated space feel comfortable while bicycling.</p>	
<p>Level of Traffic Stress 4</p>	<p>Only “strong and fearless” bicyclists feel comfortable while bicycling. These routes have high speed limits, multiple travel lanes, limited or non-existent bicycle lanes and signage, and large distances to cross at intersections.</p>	

Source: Fehr & Peers, 2017.

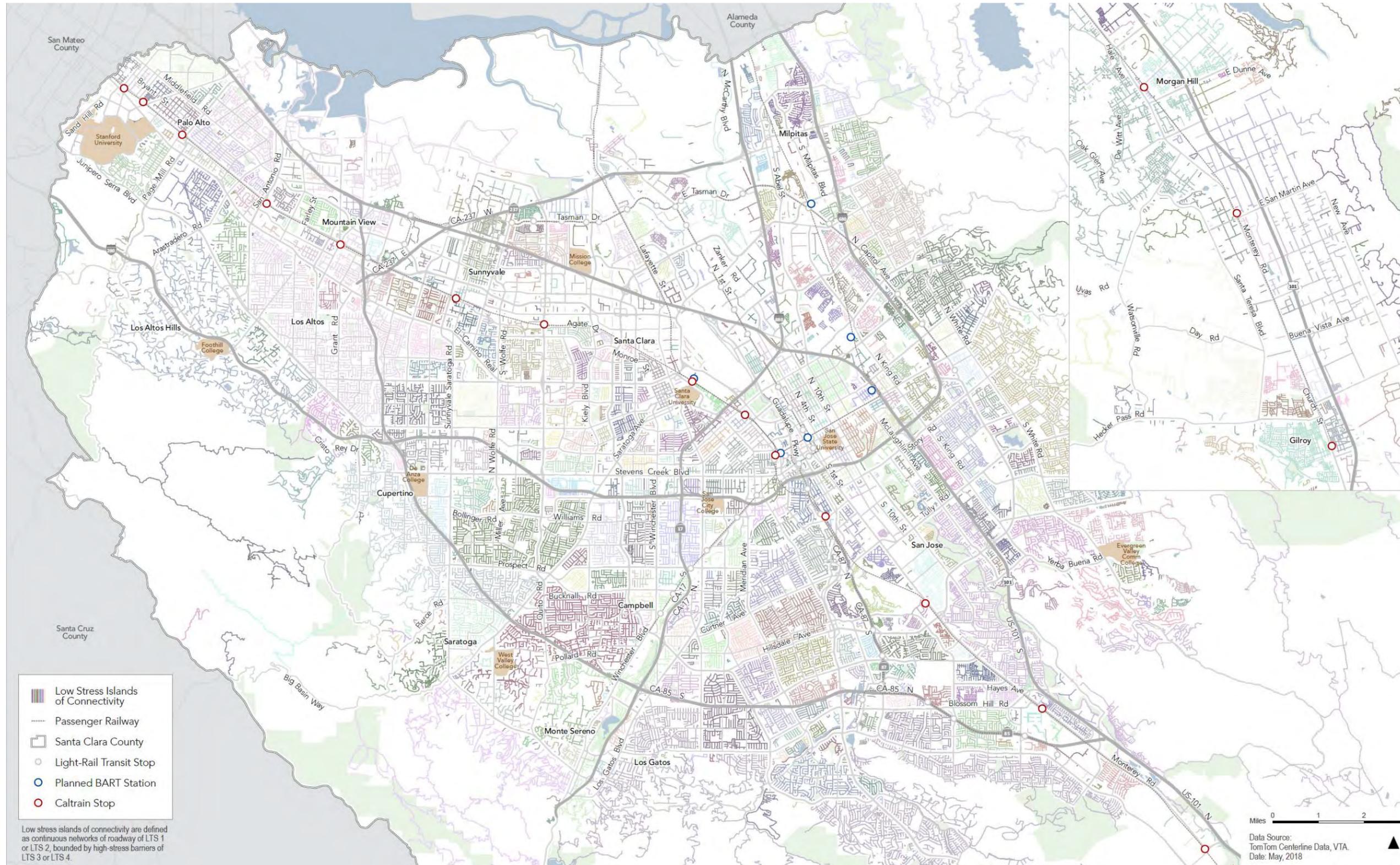


Figure 4-4: Islands of Connected, Comfortable, Low-Stress (LTS 1 or LTS 2) Bicycling Streets in Santa Clara County

Bicycles and Transit

Bicycling provides a critical first-mile/last-mile connection to and from transit. Santa Clara County regional and local transit providers accommodate bicycles to varying degrees by allowing bicycles on board transit and by providing bicycle parking at major transit stops. **Table 4-5** summarizes bicycle accommodation on board transit vehicles by provider.

All VTA buses have two-position bicycle racks, and all VTA light rail vehicles accommodate up to six bicycles. VTA's articulated buses have interior bicycle racks in addition to exterior racks. VTA is installing three-position bicycle racks on most buses in 2018.

Bicycle Parking at Transit Stops

VTA currently provides bicycle lockers at major transit destinations including, but not limited to, Caltrain stations, VTA light rail stations, VTA Park & Ride lots, and VTA Transit Centers. VTA owns and maintains approximately 200 lockers, which provide 400 bicycle parking spaces.⁶ These include 135 keyed lockers (parking spaces rented to one person for a fee) and 64 electronic lockers (parking available on a first-come, first-serve basis to anyone with an electronic key card).

Bicycle locker use varies throughout VTA's system, with some locations seeing very little use and others with a long waiting list for rentable locker spaces. VTA is studying options to improve the efficiency of providing bike locker space, including moving lockers to high-use areas and converting keyed rental lockers to electronic lockers.

Figure 4-5 shows the locations and quantities of VTA-provided keyed or electronic bicycle lockers across the County.

Other agencies also provide bike parking at transit destinations within the County. Bicycle parking at Caltrain stations includes a mix of owners and operators. Caltrain owns and maintains bike lockers at Caltrain stations from Diridon station northward. VTA owns and maintains bike lockers south of Diridon station. Several cities also own and operate bike parking at Caltrain stations. The City of Mountain View operates a bicycle storage shed at the Mountain View Transit Center. The Palo Alto Caltrain station includes a secured bike storage room.

The new BART stations at Milpitas and Berryessa will provide ample bicycle parking. Accommodations include bike rooms accessible with an electronic key card (180 double-decker racks at Milpitas Station and 120 double-decker racks at Berryessa Station), electric bike lockers (20 spaces at each station), and bike racks (20 spaces at each station). Stations have also been designed to accommodate future bicycle share docks.



Electronic bicycle lockers at Eastridge Transit Center, San Jose. Photo: VTA.

⁶ One bike locker provides two secure bike parking spaces.



Table 4-5: Santa Clara County Transit Providers' Accommodation of Bicycles on Board Transit Vehicles

Transit Provider	Bicycles Accommodated on Board Transit Vehicles	Additional Information
VTA Light Rail	Up to six bicycles	Up to four bicycles on ceiling hooks, with two additional bicycles allowed to stand on the floor in the center section (turntable area) of the vehicle.
VTA Rapid and Local Bus Routes	Up to four bicycles	All VTA buses are equipped with exterior bicycle racks, which can accommodate up to two bicycles. When racks are full, as many as two bicycles may be allowed inside the bus, at the driver's discretion. Articulated buses serving the Rapid 522 line have two interior bike racks in addition to the exterior bike racks. VTA is planning to install front bike racks with room for three bicycles on its 60-foot bus fleet.
Caltrain	70-80 bicycles	Trains are equipped with two or three bike cars, each holding 24-40 bicycles.
Capital Corridor Amtrak	Approximately 12 bicycles per bike car	Capitol Corridor trains have two bike cars, each with capacity to hold approximately 12 bicycles. Each train car also has three bike racks on the lower level.
ACE Commuter and Regional Rail	Up to 16 bicycles per bike car	Each bike car has 14 bike stalls with two additional stalls on the lower level. Regular coach cars also have four bike tie-downs on the lower level.
Dumbarton Express	Up to three bicycles	Buses are equipped with three-position bicycle racks
Highway 17 Express	Up to five bicycles	Buses are equipped with three-position bicycle racks. Up to two bicycles can be accommodated inside the bus, dependent on number of seated passengers.
BART	No number limit	Bicycles are permitted on trains at all times, with the following restrictions: Bicycles are never allowed on crowded cars; bicycles are never allowed on the first car; bicycles are not allowed on the first three cars during commute hours

Source: VTA, 2017.

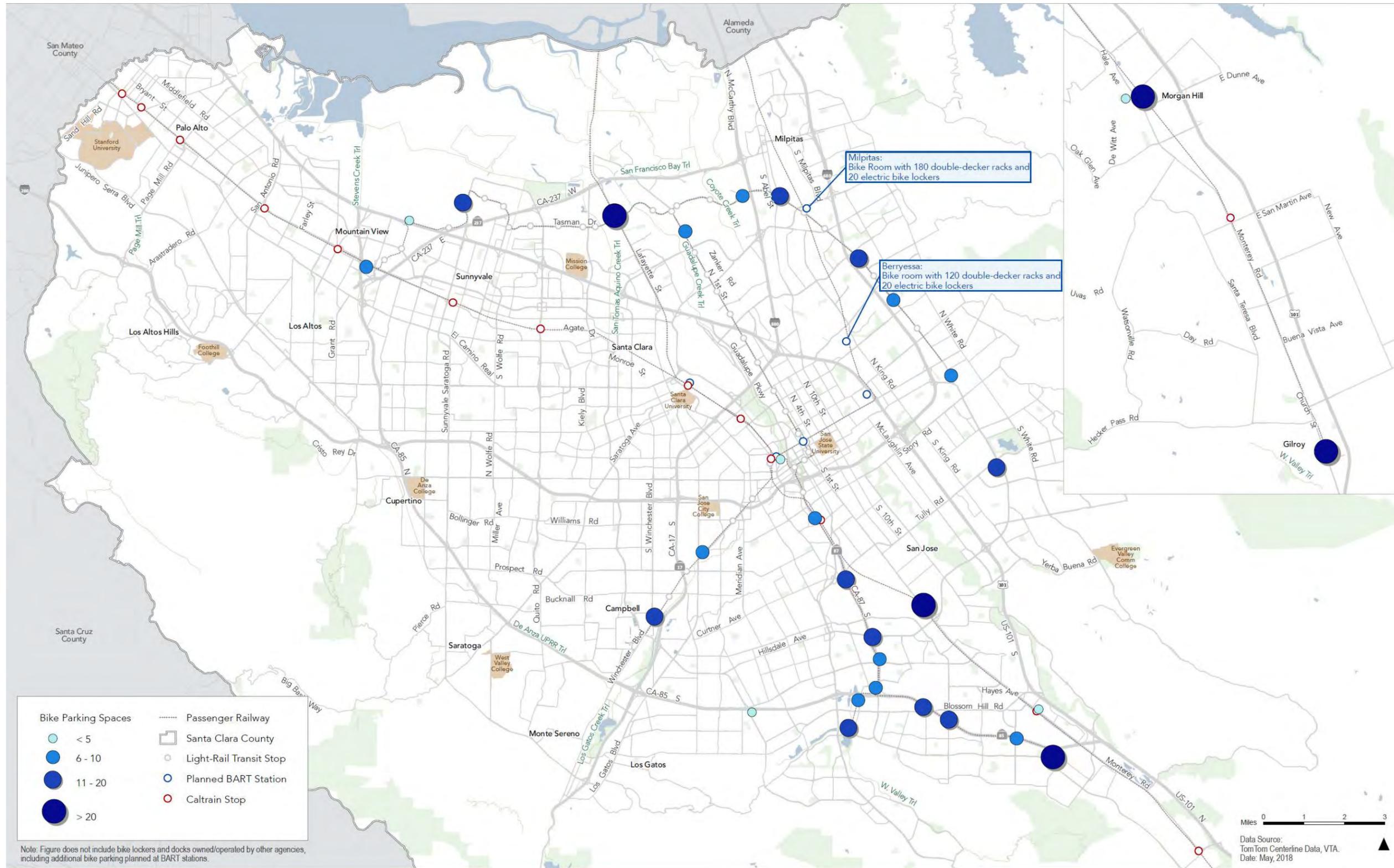


Figure 4-5: VTA-Provided Bicycle Locker Parking



Bicycle Safety

Community members identify safety concerns as the biggest barrier to biking. The Countywide Bicycle Plan prioritizes recommendations using crash data. The plan also emphasizes providing bicycle infrastructure that increases separation between bicyclists and drivers.

A detailed analysis of bicycle collisions in Santa Clara County can be found in **Appendix 4.3.**⁷ Key findings from that analysis include:

Every year in Santa Clara County, approximately 800 bicyclists are injured and six bicyclists are killed in traffic collisions.⁸ As shown in **Figure 4-6**, the most recent five years of data show a steady decline in bicycle collisions. It is unclear why bicyclist injuries grew from 2009 to 2013, but a potential cause is an increase in the number people bicycling and driving throughout the County, leading to greater exposure for bicyclists on the roadway system.

Severe collisions and fatalities are not disproportionately represented in high-minority or low-income communities.

MTC designates Communities of Concern (CoCs) where there is a high concentration of low-income or minority households.⁹ Twenty-two percent of Santa Clara County is designated a CoC, and 24 percent of severe injuries and fatalities occurred in these communities.

Bicycle collisions are two times more likely to occur at intersections¹⁰ than outside of intersections. Approximately two-thirds of all reported bicycle collisions in Santa Clara County occurred at an intersection.

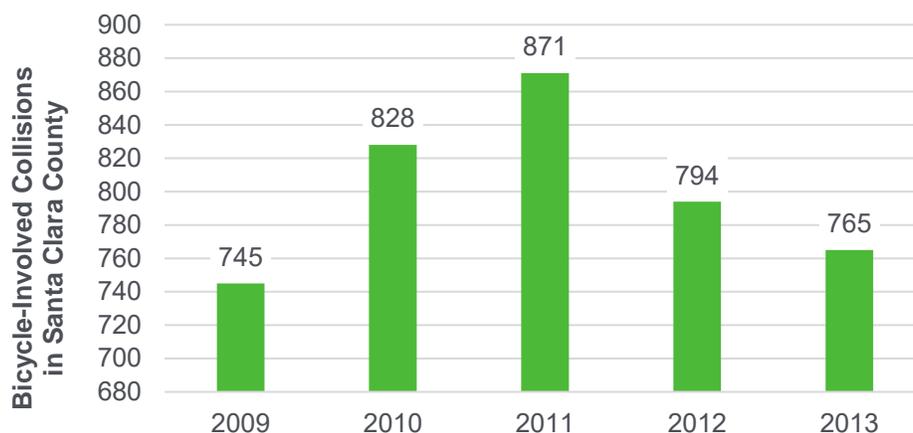
Drivers and bicyclists share the fault of bicycle collisions, but not evenly. Of the 4,003 bicycle collisions that occurred in the County between 2009 and 2013, the investigating police officer determined that the driver was the party at fault in 35 percent of the collisions and the bicyclist was the party at fault in 46 percent of the collisions. In 17 percent of the collisions the party at fault was not determined by the responding police officer.

⁷ The County Public Health Department has also assessed bicycling and safety in its 2015 [Bicycle Safety and Transportation in Santa Clara County](#) report.

⁸ Bicycle collision information based on the most recent five years of data available from the California Highway Patrol (CHP) Statewide Integrated Traffic Record System (SWITRS), 2009-2013. There are some sources of bias in collision reporting. Minor collisions involving bicyclists are generally underreported, and severe collisions involving bicyclists are generally reported by the motorist, as the bicyclist may be unable to provide input when police document the incident.

⁹ Metropolitan Transportation Commission has established Communities of Concern (COC). COCs are defined as Census tracts with high concentrations of both minority and low-income households or Census tracts with a high concentration of low-income households and three of the following criteria: limited English proficiency, zero-vehicle households, seniors 75 years or older, people with disabilities, single parent families, or rent-burdened households.

¹⁰ Collisions that occur within 50 feet of an intersection are defined as intersection collisions.



Source: SWITRS 2009-2013

Figure 4-6: Bicycle-Involved Collisions in Santa Clara County by Year (2009-2013)

Improper turning is the most common factor in collisions where drivers are found at fault. Forty percent of collisions where the driver was at fault involved a turning movement, most often noted as “unsafe turn and/or without signaling” or “left or U-turns”. The next most common driver behaviors were failing to yield to approaching traffic (eight percent), speeding (eight percent), not yielding to a bicyclist in the crosswalk (six percent), dooring¹¹ (four percent), failing to yield at a stop sign (four percent), and starting/backing when unsafe (four percent).

Riding the wrong way and speeding are the most common factors in collisions where adult bicyclists are found at fault. Of the collisions where an adult bicyclist was at fault, the five most common collision factors were riding the wrong way (25 percent), unsafe speed (15 percent), failure to yield at right turn (eight percent), unsafe turn (seven

percent) and failure to use the right edge of the roadway (six percent).

Riding the wrong way and failure to yield are the most common factors in collisions where bicyclists younger than 16 are found at fault. The most common factor was riding the wrong way (28 percent). The next most common factor was failure to yield to approaching traffic (13 percent), followed by failure to use the right edge of the roadway (nine percent).

¹¹ Dooring is a violation of California Vehicle Code 22517: “Vehicle doors, opening to traffic when unsafe” i.e. a collision between the bicyclist and an opening car door, which causes an injury to bicyclist and/or causes the bicyclist to fall. The fault is always the motorist as he/she can legally only open a car door when it is safe to do so. There can be a secondary collision whereby the now fallen bicyclist is struck by a vehicle in the adjacent lane.



Collision Densities

Countywide collision densities (i.e., collisions per square mile) are illustrated in **Figure 4-7**. Collisions occur most frequently in urban areas of the county, downtowns, and along key travel corridors where people tend to bicycle and drive.

San Jose typically experiences the highest number of bicycle collisions in the county, which is not surprising given its large size. Next highest is Palo Alto, which has a relatively high number of bicyclists.

The Countywide Bicycle Plan uses collision density as one factor in prioritizing projects. The roadways with the highest per-mile bicycle collision density in Santa Clara County are Story Road, with just over 10 bicycle collisions per mile, followed by Tully Road and Stevens Creek Boulevard with almost 7.5 bicycle collisions per mile. Member Agencies are addressing these high-collision roadways. San Jose has embarked on a Vision Zero program, aimed at eliminating traffic-related deaths and severe injuries, which includes improvements along Story Road and Tully Road. Cupertino's Bicycle Plan identifies cycle tracks along Stevens Creek Boulevard as a top priority.

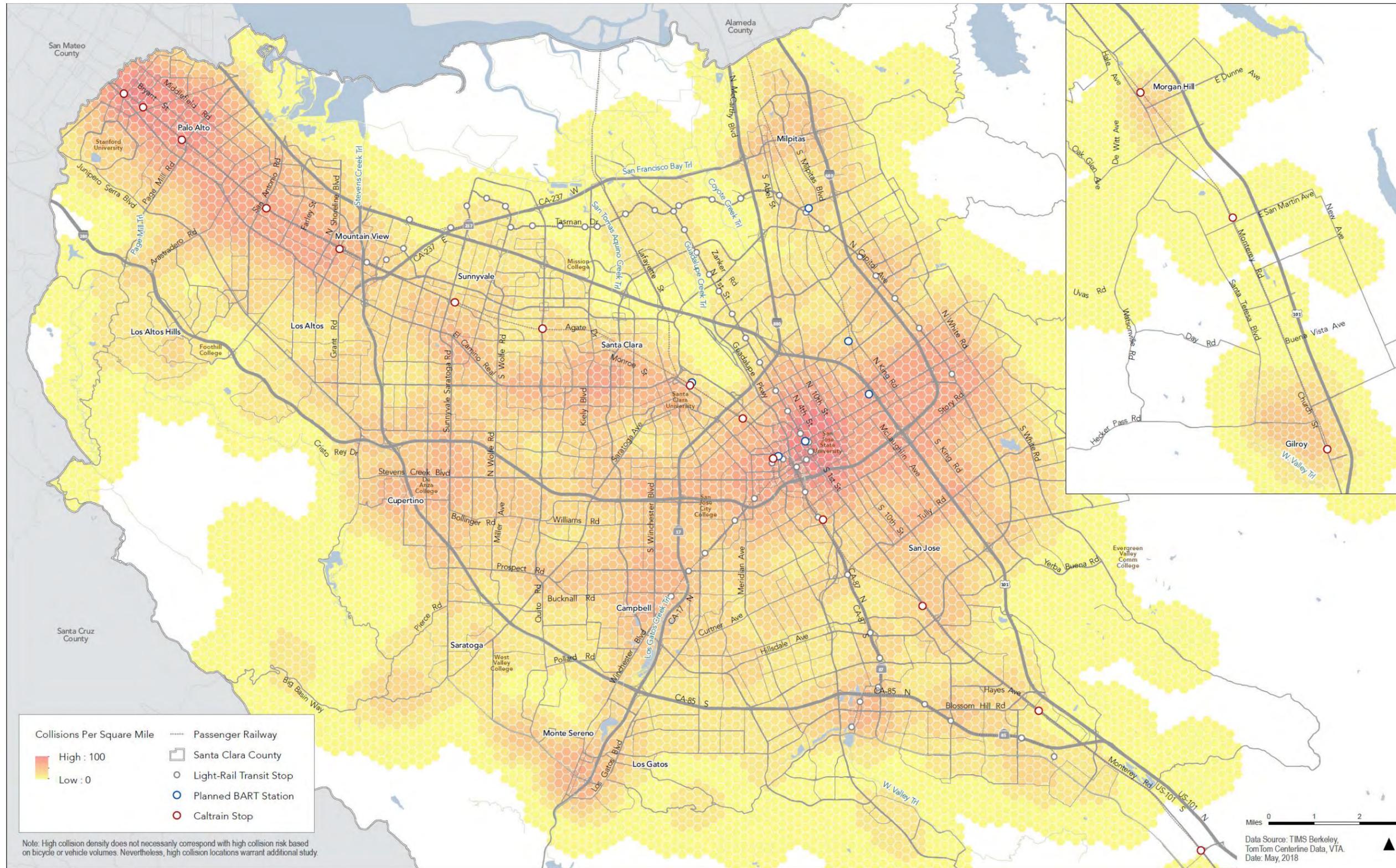


Figure 4-7: Density of Bicycle Collisions in Santa Clara County from 2009-2014

5. Cross County Bicycle Corridors

Introduction

VTA has long promoted the idea of Cross County Bicycle Corridors (CCBCs) – a subset of on-street bikeways and off-street bike paths that provide high-quality, cross-jurisdictional routes. CCBCs connect Santa Clara County communities and adjacent counties and serve major destinations and transit. CCBCs are a planning concept, and they include both built and unbuilt sections.

With this update to the Countywide Bicycle Plan, VTA has taken a fresh look at the CCBC network. We have updated the network to respond to changing conditions since the 2008 Countywide Bicycle Plan and to respond to the needs of the community and our public agency partners. As specific projects are identified along CCBCs, local agencies will conduct project-specific outreach, designs, and environmental analysis.

This chapter includes:

- An **updated and prioritized network of CCBCs** that provide access to jobs, schools, transit and major destinations.
- A vision for a network of ten **bicycle superhighways**—high quality, uninterrupted, long-distance bikeways separated from motor vehicles.
- **Design expectations** for CCBCs and bicycle superhighways.

Cross County Bicycle Corridors

There are 57 named CCBCs, and numerous connectors, totaling approximately 950 miles. Of these:

- 260 miles are existing, planned, or proposed¹² off-street bicycle paths
- 690 miles are existing, planned or proposed on-street bikeways

CCBCs are shown in **Figure 5-1**.

Appendix 5.1 lists CCBCs by name and number, and it notes key bicycle paths and roadways on each CCBC. [An interactive map of CCBCs can be found here.](#)

Connectors are shorter roadway segments that connect longer, named CCBCs. These include five expressway connectors, which are local roads that extend Expressway CCBCs. Connectors are typically contained within one jurisdiction. While important to countywide bicycle travel, and included as part of the overall CCBC network, connectors do not easily fit into a numbered CCBC.

VTA supports development of improved and physically separated bikeways along expressways where feasible and appropriate.¹³

¹² Existing bike paths and on-street bikeways (striped bike lanes, cycle tracks, or signed bike routes, including bicycle boulevards) as of February 2016. Planned bikeways are in locally adopted plans. Proposed bikeways are identified as a CCBC in VTA's Countywide Bicycle Plan, but are not identified as a bikeway in a local plan.

¹³ Bicyclists are permitted on all expressways. However, due to high motor vehicle volumes and speeds, expressways do not currently provide an environment that is comfortable for most riders. The County recommends that bicyclists exercise caution, and recommends that only advanced bicyclists use expressways.

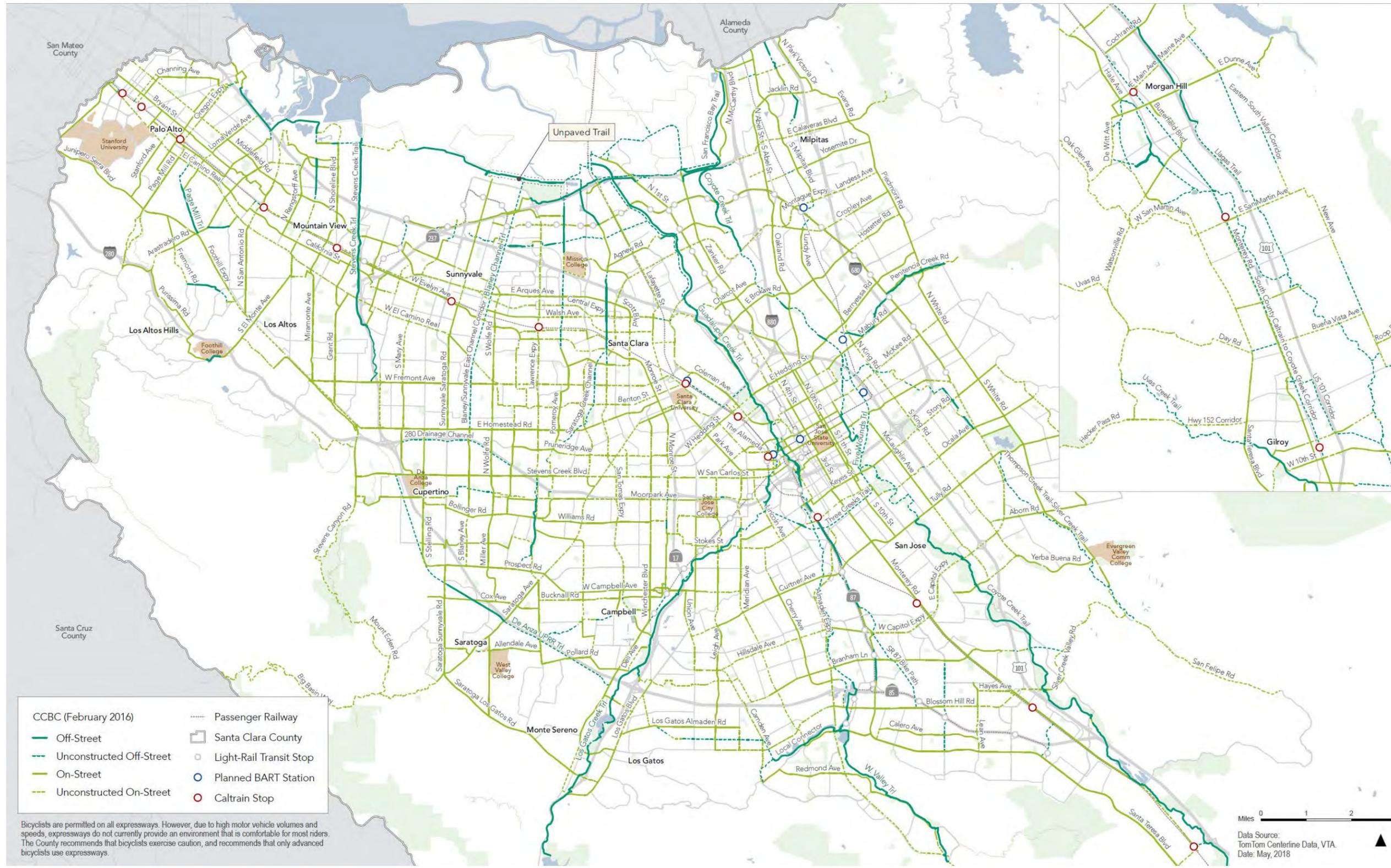


Figure 5-1: Built and Unbuilt Cross-County Bicycle Corridors

The County and VTA continue to work together to identify future opportunities that improve the bicycle and/or pedestrian environment along the expressways. There are parallel bicycle paths along portions of San Tomas, Capitol, and Page Mill Expressways. The County has long-term plans to provide parallel bicycle paths adjacent to some expressway segments, including along the northern portion of Lawrence Expressway and through the Page Mill/ I-280 Interchange.

The CCBC network also includes regional and sub-regional bicycle paths identified in the 1995 Santa Clara Countywide Trails Master Plan and 2015 Countywide Trails Prioritization and Gaps Analysis. Only the portions of trails located in urbanized areas are included in the CCBC network.

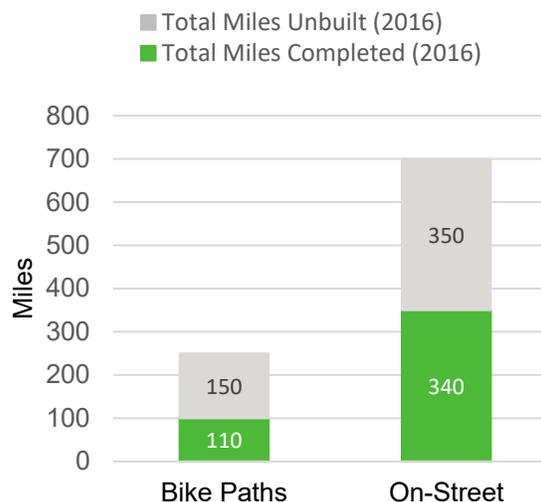
VTA recognizes that many unincorporated roadways such as Arastradero Road, Page Mill Road and Moody/El Monte Road are popular recreational bike routes. VTA encourages route improvements that are appropriate for the rural context and that facilitate safe and respectful interactions between motorists and bicyclists.

Built and Unbuilt Status

CCBC status is a planning designation, and it does not indicate whether a particular corridor has bicycle facilities or not. The CCBC network is partially implemented to date, with existing bicycle facilities on almost 50 percent of the network, as shown in **Figure 5-2**. However, there is significant work to be done to fill gaps in the current network and enhance existing facilities to meet the needs of a uniformly high-quality riding experience. Ultimately, CCBCs should provide, at a minimum,

designated space for bicyclists to ride apart from motor vehicles: bike lanes, buffered bike lanes, cycle tracks, or shared use paths. Low-volume, low-speed, two-lane roads may be designed as bicycle boulevards or signed as bicycle routes, depending on the context.

In some cases, local communities implementing CCBCs may want to reprioritize how they use roadway space to meet best practices design standards. In addition, at some locations, CCBC implementation can occur only if adjacent, associated land uses are developed.



Note: "Built" mileage includes existing bike routes, bike lanes, cycle tracks, or bicycle paths.

Source: VTA and Fehr & Peers, 2017

Figure 5-2: Built and Unbuilt Mileage of the CCBC Network (2016)

Development of the 2017 Network

Many things have changed since 2008 to support a new vision for bicycling in Santa Clara County. Most notably: construction of new developments and major transit stations, cultural shift toward mainstreaming bicycling, greater



emphasis on low-stress bikeways, and new support for innovative designs.

With these changes in mind, VTA asked the public and stakeholders to describe their preferences for updating the CCBC network. VTA focused outreach in diverse communities within the County, specifically east San Jose and South County. VTA further refined the CCBC network through a series of collaboration meetings with Member Agencies to ensure alignment with local priorities and plans.

The updated CCBC network incorporates three key principles: coverage, access to destinations, and low-stress connectivity. These principles are described in more detail, below.

Coverage

To ensure urbanized areas of the County are adequately served by CCBCs, the updated network meets the following coverage criteria:

- There is a **maximum one to two miles** (on average) between CCBCs.
- Wherever possible, **low-stress bikeways** are parallel to and on both sides of expressways, freeways, and highways.
- An **equitable network** is created by expanding CCBCs to underserved communities such as East San Jose and South County.

Access to Destinations

To ensure that bicycling is a useful mode of transportation, CCBCs provide access to the following key destinations:

- **Major transit nodes** such as Caltrain stations, high volume light rail

stations, transit centers, and the Milpitas and Berryessa BART stations (scheduled to open in 2018).

- **Trailheads for major trails**, including planned future trailheads.
- **Bicycle/pedestrian bridges**, including projects that have received funding but are not yet constructed.
- **Major employment centers**, such as North Bayshore and Downtown San Jose.
- **Major housing centers**, including both residential neighborhoods and areas with high-density housing.
- **Commercial centers** and retail corridors, such as El Camino Real, Alum Rock Avenue, Stevens Creek Boulevard, and West San Carlos Street.
- **Community colleges and universities**, including Mission College, De Anza College, West Valley College, Foothill College, San Jose State University, Santa Clara University, and Stanford University.
- **Other areas** of high demand identified through outreach and Strava¹⁴ user data.

Low-Stress Connectivity

To ensure CCBCs can be used by people of all ages and abilities and to help increase bicycling countywide, the updated network incorporates the following connectivity principles:

- CCBCs include **low volume, low speed streets**, as well as major roadways.
- **Low-stress bikeways** parallel to and on both sides of expressways, freeways, and highways are designated as CCBCs.

¹⁴ Strava is an activity-tracking app for bicyclists and runners. Strava Labs maps this data and presents it as a heat map. <https://labs.strava.com/>



In updating the CCBC network, VTA also analyzed **right-of-way (ROW) opportunities** such as underutilized Caltrans, water district, and other public entity land for potential bicycle path opportunities. A handful of opportunities were added to the CCBC network, after consultation with Member Agency staff.

Priority CCBCs

To guide planning, funding, and design decisions, VTA has identified a subset of priority CCBCs, using criteria adopted by the VTA Board of Directors. Priority CCBCs have a high potential for future bicycle ridership and a high need for improvements.

In terms of implementation, Priority CCBCs differ from non-priority CCBC's in three key ways: VTA's potential role, design expectations, and funding priority.

While VTA supports construction of the entire CCBC network, VTA will take an active role in implementing priority CCBCs. This may include leading feasibility studies and initial design of priority CCBCs, in close collaboration with Member Agencies. Priority CCBCs that cross multiple jurisdictions, provide access to major transit hubs, or that have significant technical or environmental challenges may be most appropriate for VTA to lead. **Chapter 8** describes implementation in further detail.

VTA has higher design expectations for priority CCBCs than for non-priority CCBCs. Priority CCBCs should go beyond minimum design standards whenever possible, to provide enhanced features. Design expectations are described later in this chapter. Some priority CCBCs are identified as bicycle superhighways, which have even higher design expectations.

VTA may also use priority status in scoring criteria for competitive funding programs administered by VTA. The decision to do so will be guided by input from VTA's Advisory Committees and associated working groups as VTA develops scoring criteria for various grant programs. Ultimately, the VTA Board of Directors approves grant scoring criteria.

Prioritization Methodology

To select priority CCBCs, VTA evaluated the CCBC network to identify corridors that will best advance the Countywide Bicycle Plan's vision of a safe, convenient, and connected network of bikeways that serve major destinations. Potential ridership, as estimated by VTA's travel demand model, played a key role in identifying priority CCBCs.

The VTA Board of Directors adopted the prioritization methodology in November 2016, after review by VTA advisory committees, including the Bicycle and Pedestrian Advisory Committee.

To prioritize the CCBCs, VTA broke each corridor into short segments, then assigned each segment scores based on eight metrics, listed below. Metrics were weighted according to their relative importance and combined to generate a final score for each segment.

- **Safety: High Collision Rates (10%)** Bicycle collision density. Additional weight for fatal and severe injury collisions.
- **Safety: High Level of Traffic Stress (10%)** Bicycle level of traffic stress, calculated based on posted speeds, vehicle volumes, and existing bicycle infrastructure. Higher stress segments received higher scores than lower stress segments. It is not possible to measure level of traffic stress on

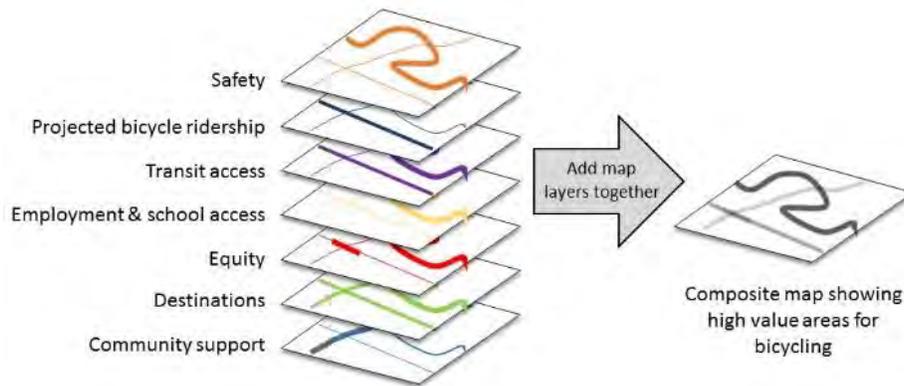


Figure 5-3: Schematic Illustrating Prioritization Methodology

unbuilt bicycle paths. Instead, we assumed all unbuilt bicycle paths have a high level of traffic stress.

- **Bicycle Ridership, Projected (20%)** 2026 projected bicycle ridership.
- **Transit Access, Projected (15%)** 2026 projected bicycle ridership traveling to/from major transit stops.
- **Employment and School Access, Projected (15%)** 2026 projected bicycle ridership for work and school commutes.
- **Destinations (15%)** Average density per mile of schools, parks, and shopping areas within 1/4 mile. Additional weight for destinations serving disadvantaged populations.
- **Equity, Projected (10%)** 2026 projected bicycle ridership to/from COCs.
- **Community Support (5%)** Corridor interest based on comments received through in-person or online outreach.

Figure 5-3 illustrates how the criteria combine to create a score for each segment. **Appendix 5.2** further describes the methodology.

Prioritization Results

Results of the prioritization analysis — in conjunction with other considerations including corridor spacing, connectivity,

and access to major destinations — guided the identification of approximately 350 miles of priority CCBCs that, when improved, will provide a superior bicycling experience, serve a large number of people, and connect a large number of destinations.

Approximately one-third of the overall CCBC network is assigned priority status (illustrated in **Figure 5-4**, and summarized in **Table 5-1**).

Table 5-1: CCBC Mileage by Priority

Status	Corridor Length in Miles*	Percent of Total
Priority CCBCs	350	37%
All Other CCBCs	600	63%
Total	950	100%

* Numbers do not sum due to rounding. Short segments of some CCBCs overlap with others. The lengths shown exclude overlapping CCBC segments. Source: VTA and Fehr & Peers, 2017.

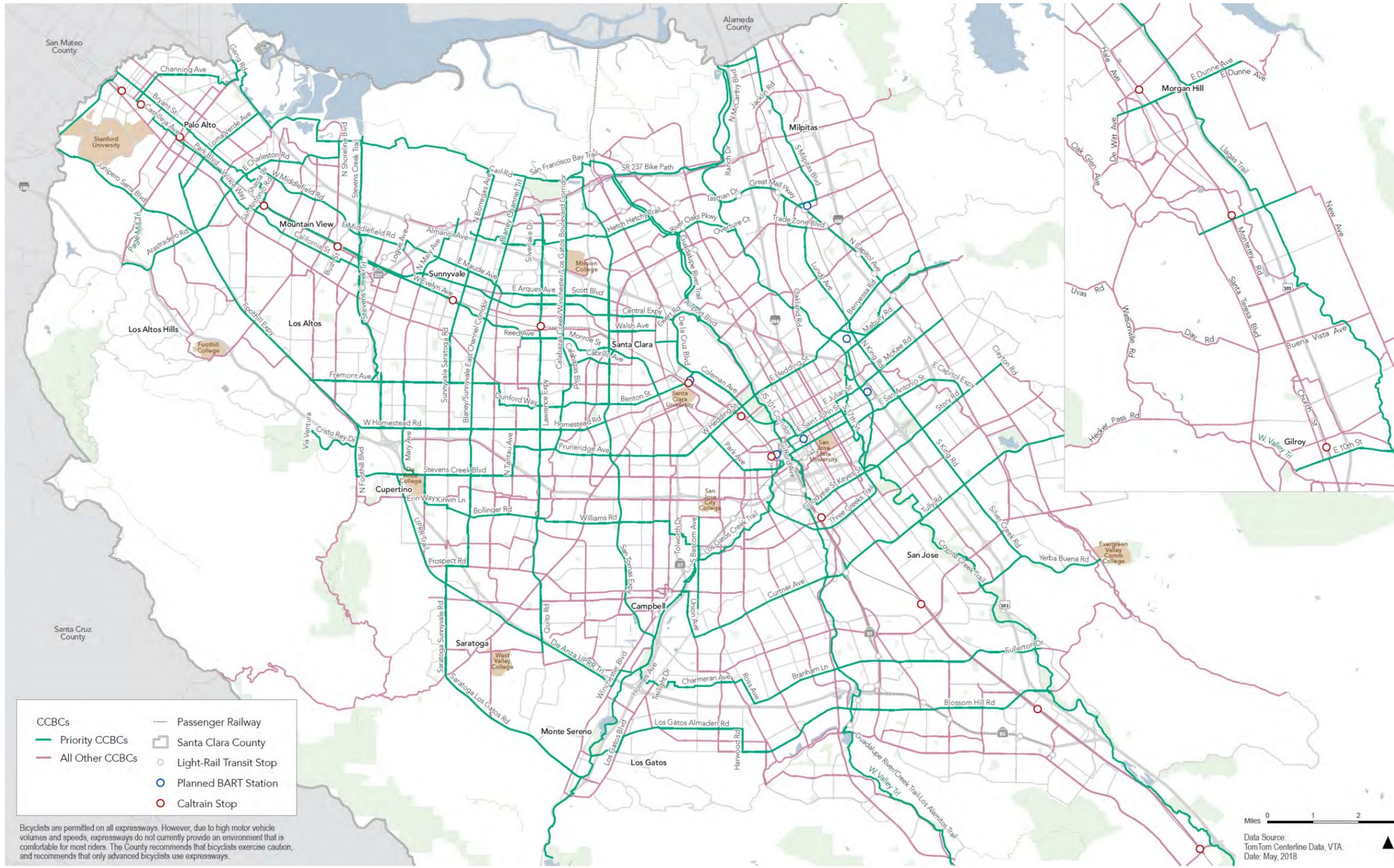


Figure 5-4: Priority Cross County Bicycle Corridors

Priority CCBCs include major trails (e.g. Guadalupe River Trail, Coyote Creek Trail, Los Gatos Creek Trail, Stevens Creek Trail), and on-street corridors (e.g. Evelyn Avenue in Sunnyvale and Mountain View; Hedding Street/ Pruneridge Avenue in San Jose and Santa Clara; and King Road in San Jose).

Priority CCBCs also include some expressways where segments of the existing right-of-way width may be suitable to accommodate physically separated bikeways. Segments of expressways are included as a long-term vision. If opportunities arise, VTA would support physically separated bicycle facilities along these corridors.

Bicycle Superhighways

In recent years, prominent bicycling cities throughout the world have addressed cross-jurisdictional bicycling using the concept of bicycle superhighways. Bicycle superhighways are intended to accommodate high volumes of bicycle commuters traveling longer distances (4+ miles). They provide a route separated from automobiles, and bicyclists using them typically experience less delay due to fewer at-grade crossings with the street network. In the US and internationally, they feature wide rights-of-way, smooth pavement, high-quality lighting, and enhanced roadway crossings or grade separation. These features, combined with smooth pavement and wide rights-of-way, allow for few interruptions and expedited



Santa Clara County's system of bicycle paths and trails already act as bicycle superhighways. Shown here, the San Tomas Aquino Creek Trail provides direct access to employers Marvell and Dell, via bicycle bridges. The trail connects residential communities in Santa Clara to Levi's Stadium, businesses along 237, the Bay Trail and the 237 Bicycle Path via five miles of continuous path.

Photo source: Richard Masoner



bicycle travel between regional destinations. Bicycle superhighways can be found in cities around the world, with prominent examples in many Dutch cities, as well as in London, Copenhagen, Chicago and Minneapolis.

In many ways, the exemplary bicycle paths in Santa Clara County, including the Guadalupe River Trail, Coyote Creek Trail, San Tomas Aquino/Saratoga Creek Trail and Stevens Creek Trail, are currently acting as bicycle superhighways. These paths provide long-distance, unbroken bicycle travel. They pass over or under major roadways, freeways, and rail lines. They include wayfinding signage, informational kiosks, and amenities along the route. They are supported by online or printed maps and dedicated social media accounts managed by city staff. Thousands of people bicycle on these trails every day. On a typical weekday morning, between 8 am and 10 am, over 800 people will pass by a given point on the Stevens Creek Trail in Mountain View.¹⁵ Over twelve hours on a typical weekday, 2,300 people were counted using the Guadalupe River Trail in San Jose.¹⁶

Using the results of the CCBC prioritization, VTA has identified a visionary bicycle superhighway network. This set of ten connected, continuous, low-friction bicycle corridors travel under or over major barriers, and they provide a backbone network to which other CCBCs and local bikeways can connect.

Candidate corridors for bicycle superhighways include:

- Bay Trail
- Stevens Creek Trail/Union Pacific Railroad Trail
- Caltrain/ Evelyn/Alma Corridor (on and off street)
- Blaney/Sunnyvale East Channel Corridor (on and off street)
- Stevens Creek/Pruneridge Corridor
- San Tomas Aquino Creek Trail/Saratoga Creek Trail
- Guadalupe River and Guadalupe Creek Trails
- Coyote Creek Trail
- Three Creeks Trail/Five Wounds Trail
- Branham Corridor (on-street)

Santa Clara County's Bicycle Superhighways are intended to provide an exemplary, uniform, and memorable riding experience. Most will be realized through bicycle paths, but, in some cases, they will be provided through on-street, physically separated bikeways. Where Bicycle Superhighways are shared with pedestrians, speeds will be limited to 15 mph or less. While each superhighway will reflect local context, the overall design should support low-stress riding, minimize conflicts with other users, provide highly legible wayfinding and high connectivity, and reduce or eliminate conflicts and wait time at major barriers. Further study is required along Bicycle Superhighways prior to implementation, such as an assessment of the availability of rights-of-way for the new facilities.

¹⁵ City of Mountain View Trail Counts conducted July 2017. Between 8 am and 10 am, 806 trail users passed by the Whisman Avenue connection.

¹⁶ San Jose Annual Count and Survey of San Jose Trails.
<https://www.sanjoseca.gov/DocumentCenter/View/61031>



Design Expectations

If we are to support bicycling as a viable alternative to driving, bikeways must feel safe and comfortable to most people, not just the fearless few. This section sets design expectations and guidance for CCBCs and bicycle superhighways. It addresses elements like appropriate bikeway type, separation of bicyclists from motorized vehicles and pedestrians, bikeway width, recommended roadway markings, intersection amenities, and crossing amenities. It draws from VTA's Bicycle Technical Guidelines, local design standards, and state and national manuals and guides.

VTA expects high quality, low stress bicycle design along CCBCs. However, implementation will be context-sensitive. Design features may be simple or complex, depending on the desired level of investment, and will vary to fit different bikeway types.

Design Principles for CCBCs

CCBCs along local roadways and bicycle paths should meet the following basic design principles:

- The lowest stress bicycle facility that is appropriate for the local context and community needs should be provided.
- CCBCs along local roads should strive to maintain LTS 1 or LTS 2, where the mainstream adult population feels comfortable bicycling.
- CCBCs on paths shared with pedestrians should not exceed bicycle speeds of 15 mph.
- Bicycle facilities/bicycling experience should remain consistent across jurisdictional boundaries, through intersections, and through interchanges.

- Bicycle wayfinding should be provided, such as on-street maps and signs at trail intersections. Maps and signs should identify the user's current location and major landmarks or destinations.
- Pavement along the bikeway should meet a pavement condition index (PCI) of 80 or higher, indicating adequate quality for bicycling.
- All actuated signals along and across the CCBC must detect bicyclists.
- Priority CCBCs should consider enhanced treatments, including some treatments for bicycle superhighways.
- Access should be provided 24 hours a day, 7 days a week, 365 days a year.
- Adequate lighting should be provided.
- CCBCs should be maintained, free of debris and other obstacles. CCBCs separated from the adjacent roadway should be designed to permit road-sweeping equipment to access the bikeway.

Design Principles for Bicycle Superhighways

In addition to meeting the CCBC design principles, **bicycle superhighways** should meet these additional principles:

- Bicyclist delay at intersections should be minimized.
- Grade separation of major barriers should be considered.
- Widths of bicycle facilities should be greater than the minimum.
- Separation of bicycle and pedestrian traffic should be considered, where possible.
- Intelligent transportation systems should be deployed in order to collect data, provide feedback to bikeway users, and facilitate travel along the corridor.



- Wayside amenities should be provided as appropriate for the local context and needs of the community.
- Branding and place making should be integrated into the bikeway as appropriate for the local context and needs of the community.
- For paths along riparian corridors, suitable parallel on-street bikeways should be identified as detour routes in the event of path closure due to maintenance or flooding.

Design Principles for Expressway CCBCs

Santa Clara County has jurisdiction over expressways. Bicyclists are permitted on county expressways, but due to the high volume and speed of motor vehicles, the County advises that only experienced bicyclists use them for travel.

Santa Clara County Roads and Airports Department refers to its Expressway Bicycle Accommodation Guidelines (BAG) when designing bicycle facilities on expressways. The BAG is integrated into VTA's Bicycle Technical Guidelines as a chapter. The County is in the process of updating the BAG to incorporate advancements in bicycle design.

Expressway CCBCs should meet the following basic design principles:

- Expressways should meet the County's Bicycle Accommodation Guidelines.
- Adaptive signal timing for bicyclists should be provided on all signalized intersections.
- The County and VTA should continue to identify opportunities to provide physically separated bicycle facilities adjacent to expressways. Examples include San Tomas Aquino Creek

Trail and plans for bicycle paths integrated into the Lawrence Expressway Grade Separation project.

Special Considerations for Bikeways along Waterways

Numerous public agencies have jurisdiction over waterways in Santa Clara County. These include, but are not limited to: Santa Clara Valley Water District, San Francisco Regional Water Control Board, California Department of Fish and Game, U.S. Army Corps of Engineers, and U.S. Fish and Wildlife Service. These agencies have specific regulations and requirements related to flood protection, environmental preservation, and access for emergency and planned or routine maintenance. Early and continued engagement with partner agencies is imperative to support development of bicycle paths along waterways.

Bicycle paths routed along waterways should be designed to balance the primary public use of the property—flood protection and stream stewardship—with recreation and bicycle transportation. To protect the flora and fauna within and along the county's waterways, lighting should be avoided or placed at locations to minimize the impacts to wildlife in the creek and riparian habitat and must be addressed as part of environmental review. It is preferable to locate bicycle paths farther from the water and provide vegetated buffers between the path and the waterway.

Bicycle paths along waterways are subject to closures throughout the year due to Water District maintenance or high water events that impact undercrossings of roadways. Based on the severity of the flooding or maintenance required,



closures may last between a few hours and several months. Detours around creek maintenance areas and portions of trails subject to flooding should be considered and established as part of the planning process for bike paths along waterways to ensure that one or more alternative routes will be available when maintenance or flooding inevitably happens.

In addition, trailside amenities, such as sign posts, benches, and fencing, should not restrict Water District vehicles from accessing their property and equipment from accessing the creek. Where feasible, pavement markings should be used instead of signs.

Recommended Design Features for CCBCs by Facility Type

As noted above, local land use and transportation context will influence the specific bicycle facility provided on a CCBC. This section describes recommended design features for different types of bicycle facilities. These were identified in collaboration with VTA Member Agencies, and incorporate national and international best practices and innovative designs.

Recommendations are consistent with VTA's Bicycle Technical Guidelines (BTG), and in cases, present higher standards than the BTG.

Bicycle Paths provide bicycle access parallel to, but removed from, high-speed, high traffic volume roadways. Bicycle paths should be at least six feet wide for one-way travel and ten feet wide for two-way travel and may be shared with pedestrians. Bicycle trails shared with pedestrians should include a 15 mph speed limit for bicyclists. Grade separation is preferred at major intersection crossings, and bicycle-

specific treatments are recommended wherever a bicycle path crosses a roadway. Examples include the Guadalupe River Trail and Stevens Creek Trail.

Cycle Tracks are on-street travel lanes designated for exclusive bicycle use, with a physical buffer used to separate bicyclists from adjacent vehicles and/or on-street parking. Cycle tracks are most appropriate on roadways with travel speeds 25 mph or above with moderate to high vehicle traffic volumes.

Recommended width is six to seven feet with a three-foot minimum buffer. Similar to bicycle lanes, cycle tracks should be equipped with signal detection and other intersection enhancements, with an especially thoughtful design approach to conflicts at intersections and driveways. Local examples of cycle tracks include Fourth Street in San Jose near San Jose State University and Middlefield Road in Palo Alto in front of Jordan Middle School. Other jurisdictions, including Mountain View and Cupertino, have installed or are proposing cycletracks.

Bicycle Lanes are on-street travel lanes designated for exclusive bicycle use, with striping to differentiate them from adjacent vehicle travel lanes. Bicycle lanes are appropriate on roadways with travel speeds of less than 35 mph and up to two vehicle travel lanes in each direction. They should be at least six feet wide and equipped with signal detection and other intersection enhancements. Third Street in downtown San Jose and Evelyn Avenue in Sunnyvale are local examples of bicycle lanes.

Bicycle Routes are designated routes where the bicycle travel lane is shared with vehicles. Bicycle routes are best suited to roadways with speed limits of 25

mph or less and one vehicle travel lane in each direction. Traffic calming measures can be used on designated bicycle routes to reduce traffic speeds and minimize vehicle volumes. Amarillo-Moreno Bicycle Boulevard in Palo Alto is an example of a bicycle route with traffic calming.

Table 5-2 summarizes design expectations for CCBCs by bikeway type. It divides treatments into minimum recommended design treatments and enhanced design treatments:

- All CCBCs should meet the **minimum** recommended design treatments.
- Where appropriate, and whenever possible on priority CCBCs and bicycle superhighways, CCBCs should receive **enhanced** treatments.

With minor exceptions, recommendations in the table meet or exceed VTA's Bicycle Technical Guidelines.¹⁷

Appendix 5.3 contains an illustrated toolkit of bikeway treatments. The appendix is useful for visualizing the treatments listed in this chapter. It includes examples of how a treatment looks on the street, design considerations and details, and design guideline references. It should be used in conjunction with the Bicycle Technical Guidelines and other sources published by VTA, Caltrans, American Association of State Highway Transportation Officials, North American City Transportation Officials, and Federal Highway Administration.



Whimsical public art, like the quail sculptures at the Cupertino entrance of the Don Burnett Bicycle/Pedestrian Bridge, creates a sense of place and enhances the bicycling experience. Here, neighbors have placed knitted hats and scarves on the birds for the winter. Photo: VTA

¹⁷ The Bicycle Technical Guidelines (BTG) were last updated in 2012. They have not yet been updated to incorporate recent advancements in the design of cycle tracks (separated bikeways). There are minor discrepancies between the BTG and recommendations in Table 5-1 for cycle track lane and buffer width. In this instance, we have drawn from the more recent federal and state guidance on cycle tracks: Federal Highway Administration's "Separated Bike Lane Planning and Design Guide" (2015) and Caltrans' Design Information Bulletin 89 "Class IV Bikeway Guidance (Separated Bikeways/Cycle Tracks)" (2015).

Table 5-2: Recommended Minimum and Enhanced Design Features for CCBCs by Bikeway Type

Feature	Bikeway Type							
	Bicycle Path Caltrans Class I		Cycle Track Caltrans Class IV		Bicycle Lane Caltrans Class II		Bicycle Route Caltrans Class III	
	Minimum	Enhanced	Minimum	Enhanced	Minimum	Enhanced	Minimum	Enhanced
Key Design Features								
Physically separated from roadways	•	•	•	•				
Dedicated space for bicyclists	•	•	•	•	•	•		
Appropriate roadway travel speed			=>25 mph	=>25 mph	<35 mph	<35 mph	=<25 mph	=<25 mph
Appropriate maximum number of travel lanes in each direction					2	2	1	1
Bicycle boulevard treatments (traffic calming)							•	•
Mixed-use facilities: pedestrian space separated with striping and signage		•						
Shared lane markings after every intersection and every 250' thereafter							•	•

Feature	Bikeway Type							
	Bicycle Path Caltrans Class I		Cycle Track Caltrans Class IV		Bicycle Lane Caltrans Class II		Bicycle Route Caltrans Class III	
	Minimum	Enhanced	Minimum	Enhanced	Minimum	Enhanced	Minimum	Enhanced
Width								
Facility width (does not include clear space for gutters, etc.)	6' (1-way) 10' (2-way)	12' (2-way, bikes only) 18-20' (2-way, mixed)	6' (2-way) 7' (1-way)	6' (2-way) 7' (1-way)	6'	6'		
Buffer width between bikeway and travel lane and/or parking lane	N/A	N/A	3' physical	3' physical		2' (min.) painted		
Intersections								
Advanced bicycle detection that detects bicyclists by lane and/or by movement	•	•	•	•	•	•	•	•
Separate bicycle signal phase	if needed	•	if needed	•				
Bicycle boxes (at signalized intersections with 2+ lanes per direction and permissive or split phasing)			if needed	if needed	if needed	if needed		
Green pavement at major conflict zones (e.g. signalized intersections)			•	•	•	•		

Feature	Bikeway Type							
	Bicycle Path Caltrans Class I		Cycle Track Caltrans Class IV		Bicycle Lane Caltrans Class II		Bicycle Route Caltrans Class III	
	Minimum	Enhanced	Minimum	Enhanced	Minimum	Enhanced	Minimum	Enhanced
Protected intersections				•		•		
Facility wraps behind bus stops			•	•		•		
Traffic calming and vehicle diversion								•
Stop signs on cross streets to favor bicycle progression							•	•
Grade separation at major intersections (4+ lanes per direction, speeds over 40 mph); underpasses preferred		•						
Rest bars at curbs		•		•				
Public art		•		•				
Mid-Block Crossings								
Signalize crossing	•	•						
Loop/video detection	•	•						
Separate pedestrian crosswalk from bicycle crossing for multi-use facilities	•	•						
Allow bikes to cross without dismounting	•	•						

Feature	Bikeway Type							
	Bicycle Path Caltrans Class I		Cycle Track Caltrans Class IV		Bicycle Lane Caltrans Class II		Bicycle Route Caltrans Class III	
	Minimum	Enhanced	Minimum	Enhanced	Minimum	Enhanced	Minimum	Enhanced
Wayfinding and Placemaking								
Branding pavement logo		•		•		•		•
Guide signs at major intersections or decision points.	•	•	•	•	•	•	•	•
Identity signage at each path entrance/exit.		•						
Alternative on-street detour routes designated in the event of trail closures	•	•						
Mile markers/distance markers		•		•		•		•
Bicycle counters with displays		•		•		•		•
Trail exit signage or pavement markings (located in advance of trail exit)	•	•						
City identity signage		•						
Signage to bicycle parking		•		•		•		•



Feature	Bikeway Type							
	Bicycle Path Caltrans Class I		Cycle Track Caltrans Class IV		Bicycle Lane Caltrans Class II		Bicycle Route Caltrans Class III	
	<i>Minimum</i>	<i>Enhanced</i>	<i>Minimum</i>	<i>Enhanced</i>	<i>Minimum</i>	<i>Enhanced</i>	<i>Minimum</i>	<i>Enhanced</i>
Lighting and Visibility								
Basic on-street lighting			•	•	•	•	•	•
Overhead trail lighting (continuous or demand responsive), where feasible	•	•						
Low level (foot) lighting, where feasible		•		•				
Illuminated surfaces (light absorbing/solar surfaces)		•		•				
Convex mirrors to provide visibility of oncoming bike traffic in situations with limited sight distance		•						



Feature	Bikeway Type							
	Bicycle Path Caltrans Class I		Cycle Track Caltrans Class IV		Bicycle Lane Caltrans Class II		Bicycle Route Caltrans Class III	
	Minimum	Enhanced	Minimum	Enhanced	Minimum	Enhanced	Minimum	Enhanced
Amenities								
Rest stops every 2 to 3 miles that include trash cans, basic maintenance station (air and tools), water fountain, bike parking, and seating		•		•		•		•
Upgraded rest stops every 4 to 6 miles or at major trailheads, with amenities such as covered benches, information kiosks, and bathrooms. May be substituted with wayfinding to proximate nearby parks with similar amenities.		•						



Demonstration Projects

The following pages provide conceptual ideas that illustrate the design expectations for CCBCs and Across Barrier Connections. The locations are all on priority CCBCs, and provide a range of examples that can apply to other locations within the county. They were selected to provide a broad overview of options and to inspire. VTA sought input from Member Agencies when developing conceptual designs. However, these demonstration projects are not intended to replace or supersede local planning documents, but rather to enhance and broaden expectations.

Hale Avenue Extension

The extension of Hale Avenue in Morgan Hill and Unincorporated County will create a complete street that includes bicycle lanes and a parallel bicycle and pedestrian path. The roadway design of the first phase was developed by the City of Morgan Hill and supported by the County. This project will create a new, low stress CCBC.

SkyLANE

The City of San Jose Trails Program has developed a vision study for a signature bicycle and pedestrian bridge that extends the Three Creeks Trail from Willow Glen neighborhood, across High Speed Rail, VTA Light Rail, Caltrain, and State Route 87, to Coyote Creek Trail. The visionary project is conceptual, but presents an example of how bicycle facilities can be used for placemaking and tourist attractions.

101/Blossom Hill Road

The City of San Jose is redesigning the Blossom Hill Road/U.S. 101 interchange to provide a bicycle and pedestrian path

through the interchange. The proposed project carries bicyclists over the northbound on-ramp, across the freeway, and under the southbound on and off ramps, eliminating all conflicts with motor vehicle traffic. This project provides a low-stress bicycle connection between neighborhoods west of US 101 to Coyote Creek Trail east of US 101.

Lundy Place Connector

This potential bicycle and pedestrian bridge connects CCBC King Road/Lundy Place across the BART tracks to Milpitas Boulevard. It enhances and improves bicycle access to Milpitas BART from south of Capitol Avenue. It was studied as a potential project during the development of the Milpitas BART station. However, the schedule and complexity of the project was determined to be incompatible with the BART schedule. It is presented here as a potential Across Barrier Connection.

Diridon Bicycle Connections

Diridon Station will see significant changes in the future, with the construction of BART Phase II, High Speed Rail, and development plans by high-tech firms. The station is on track to become the Grand Central Station of the West Coast. Change at Diridon presents an unparalleled opportunity to create seamless bicycle connections with the heavily-used Guadalupe River Trail and Los Gatos Creek Trail. This demonstration project highlights superior bicycle-transit station integration from around the world, and provides inspiration for what Diridon Station could become.

HALE AVENUE EXTENSION

DEMONSTRATION PROJECT



PROPOSED

EXISTING

Study Credit of:  CITY OF MORGAN HILL

DESCRIPTION

The extension of Hale Avenue will create a 2-lane arterial that includes bicycle lanes and a bicycle/pedestrian path. The new roadway will create a multimodal corridor connecting neighborhoods west of Monterey Road, alleviating the need for the circuitous routes currently in use.

The Hale Avenue corridor could serve as a template for improving multimodal connectivity to rural and low-density neighborhood areas throughout Santa Clara County. Opportunities exist along many rural roads in South County to convert excess right-of-way for multimodal use.

BENEFITS

- This corridor is a CCBC.
- Provides a safe and efficient alternative to Monterey Road for cyclists and pedestrians.
- Enhances multimodal connectivity to neighborhoods on the west side of Morgan Hill.
- Promotes cycling through the provision of parallel bicycle lanes and bike/ped path on one corridor.

CONSTRUCTION COST



SANTA CLARA COUNTYWIDE BICYCLE PLAN

SKYLANE

DEMONSTRATION PROJECT



Study Credit of: **SAN JOSE**
PARKS, RECREATION & NEIGHBORHOOD SERVICES CITY OF
SAN JOSE
CAPITAL OF SILICON VALLEY

DESCRIPTION

SkyLANE provides a vision for a graceful elevated bike path crossing major transportation corridors and enhancing the identity of public space. It represents big picture thinking and creative problem solving where an at-grade path connection is not feasible.

SkyLANE is a unique design that could be used to inspire a futuristic vision for other enhancements to the trail network in Santa Clara County.

BENEFITS

- Connects two CCBCs: Guadalupe River Trail and Coyote Creek Trail
- Bicycle Superhighway
- Provides bicycle and pedestrian access across barriers
- Enhances the identity of the surrounding community
- Connects key destinations and potential new entertainment districts
- Tourist attraction

CONSTRUCTION COST



SANTA CLARA COUNTYWIDE BICYCLE PLAN

US 101 / BLOSSOM HILL ROAD INTERCHANGE

DEMONSTRATION PROJECT



Study Credit of:  **CITY OF SAN JOSE**
CAPITAL OF SILICON VALLEY



DESCRIPTION

The US 101 / Blossom Hill Road interchange improvements will construct a bicycle/pedestrian path on the north side of Blossom Hill Road through the US-101 interchange.

The US 101 / Blossom Hill Road interchange improvements represent a prototype for active transportation improvements which could be implemented at selected interchanges throughout Santa Clara County.



BENEFITS

- Cross County Bicycle Corridor (CCBC) and Across Barrier Connection (ABC).
- Provides low-stress bicycle and pedestrian access through a major interchange in San Jose.
- Improves safety and reduces conflicts between bicycles and vehicles.
- Connects major housing, employment, and recreation areas for active users.
- Connects to Coyote Creek Trail.



CONSTRUCTION COST



Low



High



SANTA CLARA COUNTYWIDE BICYCLE PLAN

LUNDY PLACE CONNECTOR

DEMONSTRATION PROJECT



Study Credit of:  

DESCRIPTION

The Lundy Place Connector and related projects will build on the multimodal improvements initiated with the development of the Milpitas BART Station. The project will close a key gap in bicycle facilities along the King-Lundy-Milpitas Cross County Bicycle Corridor (CCBC).

The Lundy Place Connector provides a blueprint for bridging other barriers that create gaps in the Santa Clara County bicycle network.



BENEFITS

- Provides key bicycle and pedestrian access across a major barrier.
- Enhances multimodal access to transit facilities.
- Connects a major bicycle corridor between San Jose and Milpitas.

CONSTRUCTION COST



SANTA CLARA COUNTYWIDE BICYCLE PLAN

CONNECTIONS TO DIRIDON STATION

DEMONSTRATION PROJECT

Study Credit of:  CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Amsterdam, Netherlands



An artistic tunnel provides efficient circulation for bicycles and pedestrians beneath Amsterdam's Centraal Station.



Amsterdam, Netherlands

A high quality bikeway allows seamless connections to Amsterdam's Centraal Station.



Description

As part of the re-envisioning of Diridon Station, proven multimodal access strategies from transportation centers around the world will be evaluated and implemented.

Bicycle and pedestrian access strategies implemented at Diridon Station can influence the vision for multimodal improvements at transit facilities Countywide.



BENEFITS

- Enhances multimodal access to transit facilities.
- Improves safety and reduces conflicts between bicycles and vehicles.
- Connects major housing, employment, and transportation facilities for active users.



SANTA CLARA COUNTYWIDE BICYCLE PLAN

CONNECTIONS TO DIRIDON STATION

DEMONSTRATION PROJECT



Münster, Germany

Photo: Eric Eidlin

Direct ramped access to a bicycle parking garage at Münster Hauptbahnhof railway station in Münster, Germany.



Utrecht, Netherlands

Photo: Eric Eidlin

The Moreelsebrug is a modern bicycle and pedestrian bridge spanning railroad tracks adjacent to Utrecht Centraal Station.



Amsterdam, Netherlands

Photo: Eric Eidlin

A subsurface structure provides parking spaces for thousands of bicycles at Amsterdam Centraal Station.



Maastricht, Netherlands

Lifts in Maastricht, Netherlands significantly increase bicycle parking supply in a compact space. Lifts are frequently used for both indoor and outdoor bicycle parking in the Netherlands.

SANTA CLARA COUNTYWIDE BICYCLE PLAN

6. Across Barrier Connections

A bicycle trip is only as good as its weakest link. Even the most exceptionally designed Cross County Bicycle Corridors (CCBCs) will fail if they have gaps. Just as a motorist does not expect an expressway to narrow suddenly to a two-lane dirt road, a bicyclist should not find a cycle track suddenly dumps them into a freeway interchange where they need to weave across one or more lanes of high-speed motor vehicles.

Unfortunately, a person bicycling through Santa Clara County today, even on an excellent path or bike lane, will often encounter an obstacle they cannot or do not want to cross. It may be a freeway interchange, a major arterial, an expressway, a railroad track, or a creek. Addressing these barriers is essential for creating a functional network of connected, comfortable CCBCs.

Fortunately, VTA can play a role in addressing many of the worst problem spots. We see every freeway interchange project as an opportunity to improve safety and comfort for bicyclists and pedestrians. We will continue to fund, design, and construct high-impact bicycle bridges and undercrossings. This chapter identifies locations where new connections are needed, and prioritizes a set of locations, helping VTA and Member Agencies plan future capital projects.



Bicycle bridges, like this one connecting Stevens Creek Trail over the State Route 85/Moffett Boulevard interchange, are essential for a functional countywide bicycle network. Photo credit: Richard Masoner

Across Barrier Connections (ABCs)

Major barriers are found throughout Santa Clara County. This chapter focuses on the most challenging: freeways, waterways, and railways. For the 2008 Countywide Bicycle Plan, VTA inventoried these barriers to identify locations where new or improved bicycle crossings are needed. These locations are called “Across Barrier Connections” or ABCs.

ABCs can be thought of as “problem spots” where improvements are needed to close gaps in the bicycle network. Potential improvements range in scale from restriping a roadway to provide bike lanes to constructing a new bicycle/pedestrian bridge, to completely rebuilding a freeway interchange.

ABCs are sorted into three categories:

Category 1: Inadequate Roadway

Crossings – Existing roadway crossings of barriers where there is no bicycle lane and the shoulder is less than four feet wide. These locations would benefit from dedicated space for bicyclists, such as bicycle lanes or cycle tracks. Examples include Lafayette Street crossing US 101 or Bascom Avenue at Los Gatos Creek.

Category 2: Unfriendly Freeway

Interchanges – Freeway interchanges with free on/off-ramps or no bicycle lane or shoulder. These locations would benefit from modifications to reduce or eliminate conflicts between motorists and bicyclists, such as squared up ramps, or physical separation between modes. Where conflicts remain, treatments to improve bicyclist visibility, such as green paint or protected intersections may be appropriate. Examples include US 101 and Mathilda, or Page Mill and I-280.

Category 3: Large Distance between Existing Crossings of Major Barriers –

Segments where physical crossings of major barriers are more than one mile apart. These locations would benefit from new connections, such as bicycle bridges, undercrossings, or roadway extensions. For example, US 101 in San Jose between Blossom Hill Road and Coyote Creek Trail.

Status of ABCs from 2008 Bicycle Plan

The 2008 Countywide Bicycle Plan identified over 330 ABCs. Overall, since 2008, only 50 of the original ABCs have been addressed and another 32 are partially funded.



ABC Category 1 Example: Via Del Oro undercrossing of SR 85, San Jose. The City has since added wide sidewalks on both sides, bike lanes, and pedestrian lighting.



ABC Category 2 Example: Tully Road interchange with Hwy 101. VTA has since modified this interchange to eliminate high-speed ramps and provide continuous bicycle lanes, wide sidewalks, and street trees.



ABC Category 3 Example: Santa Clara Caltrain Pedestrian undercrossing. VTA constructed a tunnel under Caltrain and future BART tracks at the Santa Clara Caltrain Station. Photo: VTA.

As shown in **Table 6-1**, the greatest progress has been made in addressing inadequate roadway crossings (Category 1). Of these, 38 have been completed and 10 currently have partial funding. Many Category 1 ABCs have been addressed by restriping the roadway to provide bicycle lanes. This is far easier and less expensive than rebuilding high-speed freeway ramps or constructing a new bicycle bridge, as would be necessary for Category 2 and Category 3 ABCs. The latter improvements are large-scale infrastructure projects, which require significant funding and proactive, long-term planning and design.

Since 2008, VTA and Member Agencies have built some critical crossings that address Category 2 and 3 ABCs. These include Sunnyvale’s two Borregas Avenue bicycle/pedestrian bridges over

SR 237 and US 101, the Don Burnett (Mary Avenue) Bicycle and Pedestrian Bridge over I-280 in Cupertino, and the Santa Clara Caltrain Undercrossing. Several freeway interchanges have been restriped, retrofitted, or rebuilt with improved bicycle accommodations. Examples include the reconstruction of the Tully Avenue/US 101 interchange in San Jose and modifications to the Stevens Creek/I-280 interchange in Cupertino. Both projects were led by VTA.

Some Category 1 ABCs, such as where low-volume, low-speed, residential streets cross creeks, may currently accommodate bicyclists comfortably, even without wide shoulders. VTA will conduct a future assessment of the quality of all ABC crossings and may further refine the list.

Table 6-1: Status of Across Barrier Connections

ABC Type	Completed Since 2008	In Progress (some funding)	Planned but Not in Progress	Unplanned (not in any local planning document)	Total Remaining to Complete
Inadequate Roadway Crossings (Category 1)	38	10	41	56	107
Unfriendly Freeway Interchanges (Category 2)	9	13	52	17	82
Large Distance between Crossings (Category 3)	3	9	49	33	91
TOTAL	50	32 11%	142 51%	106 38%	280 100%



Updated Across Barrier Connections

VTA has updated the list of ABCs for the 2018 Countywide Bicycle Plan. They are shown in **Figure 6-1**. A full list of ABCs is provided in **Appendix 6.1**

VTA has removed seven ABCs from the 2008 list:

- I-280/Sand Hill Road was removed as it is located in San Mateo County. (Category 2)
- I-280/Alpine Road was removed as it is located in San Mateo County. (Category 2)
- US 101/University Avenue was removed as it is located in San Mateo County. (Category 2)
- Coyote Creek between Dixon Landing Road and Warren Avenue (Category 3) was removed as it is not located in Santa Clara County.
- Three Category 3 ABCs in South County were removed due to very low density land use with no planned land use changes in that area to merit new bicycle bridges. Removed segments are Llagas Creek between Bloomfield Road and Highway 152 in Gilroy, and Llagas Creek between Edmunson Avenue and Llagas Road, and Uvas Creek between Hecker Pass Highway and Uvas Road, both in unincorporated county.

Given these changes to the list and the progress made in addressing ABCs, 280 ABCs remain. Of these, 107 are inadequate roadway crossings (Category 1), 82 are unfriendly freeway interchanges (Category 2), and 91 are large distances between existing crossings of major barriers (Category 3).

Priority ABCs

Capital projects that address ABCs can be expensive. A new bicycle/pedestrian bridge can be upwards of \$10 million. Redesigning a freeway interchange can be upwards of \$50 million. To assist with planning and funding decisions, VTA has identified a subset of priority Across Barrier Connections.

To generate a priority list, VTA evaluated ABCs by asking the following questions:

- Does it close a gap in a priority CCBC?
- Does it create a connection to a nearby priority CCBC?
- Was it submitted for consideration for 2016 Measure B through VTA's Envision Process?
- Is it included in a local planning document?
- Is it included in a VTA plan, other than the Countywide Bicycle Plan?

The more "yes" answers, the higher an ABC scored. Based on this rubric, 39 ABCs are identified as priority for improvement. They include:

- One Inadequate Roadway Crossing ABC (Category 1): the Sunnyvale Avenue crossing of Caltrain, which will be realized through a grade separation project currently under study by the City of Sunnyvale.
- 13 Unfriendly Freeway Interchange ABCs (Category 2)
- 25 Long Distance between Crossings ABCs (Category 3).

Priority ABCs are highlighted on **Figure 6-1** and noted in **Appendix 6.1**.

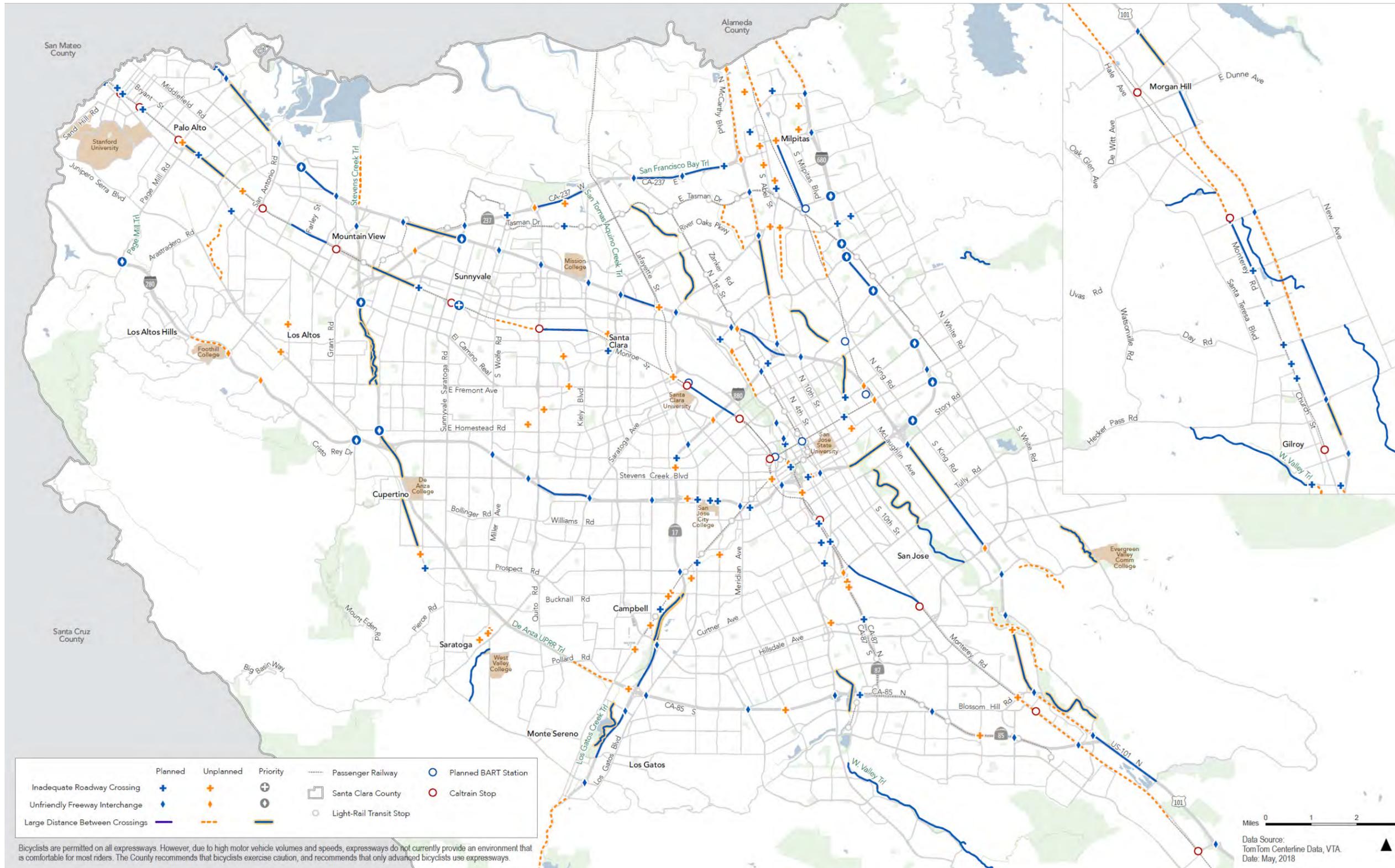


Figure 6-1: Across Barrier Connections (2017)

Planned Projects

Addressing ABCs will require strong effort from all stakeholders and significant funding. Fortunately, there are numerous planned projects that will create or enhance bicycle access across barriers.

VTA and Member Agencies have identified a long list of freeway interchanges that are due for reconfiguration or reconstruction. While most of these projects are driven by the desire to improve motorist conditions, each is an opportunity for improving bicycle safety, comfort, and convenience. Complete Streets policies adopted by VTA and Member Agencies require all transportation projects to include context-

sensitive bicycle infrastructure, and make it all but certain interchange projects will improve conditions for bicyclists.

Table 6-2 lists planned interchange projects.

Other projects will also create new connections for bicyclists. These include bicycle bridges, undercrossings, grade separations, and roadway extensions. Some, but not all, address linear ABCs (Category 3). **Table 6-3** lists the planned projects and notes which ones address linear ABCs. They are mapped in **Figure 6-2**. All projects listed, whether they address ABCs or not, are important and are incorporated into this plan.

Table 6-2: Near-Term Planned Freeway Interchange Improvement Projects

Freeway Interchange	Lead/ Jurisdiction	Freeway Interchange	Lead/ Jurisdiction
101/237/Mathilda Interchange Improvements	VTA/Sunnyvale	101/Zanker Improvements	VTA/San Jose
101/Trimble/De La Cruz Interchange Improvements	VTA/San Jose	101/Maybury New Interchange	San Jose
101/Blossom Hill Interchange Improvements	San Jose	I-280/Page Mill Interim Improvements	County/ Palo Alto/ Los Altos Hills/ Caltrans
I-280/Wolfe Interchange Improvements	VTA/Cupertino	I-280/Winchester Interchange Improvements	VTA/San Jose/ Santa Clara
101/SR 25 Interchange Improvements	VTA/Gilroy/ County	101/Buena Vista New Interchange	VTA/Gilroy/ County
101/San Antonio/ Rengstorff Interchange Improvements	VTA/ Mountain View		

Source: VTA Highways Program

Note: This table only includes highway projects anticipated to be in development during the 2018 and 2019 fiscal years. For a list of long-term highway projects, refer to the 2016 Measure B Highway Interchanges Program List, which is included as Attachment B of [2016 Measure B Resolution](#).



Table 6-3: Planned Bicycle Bridge/Undercrossings

Barrier	Crossing	Jurisdiction	Description	ABC?
Caltrain	Brokaw Road	Santa Clara	Roadway Extension/ Overcrossing	Y
Caltrain	Rengstorff Avenue	Mountain View/ County	Grade Separation	N
Caltrain	Stanford Avenue/ Seal Avenue	Palo Alto	Potential Bike Ped Bridge	N
Caltrain & Central Expressway	Mayfield Avenue	Mountain View/ County	Potential Bike Ped Undercrossing	N
Caltrain & Central Expressway	Castro Street/ Moffett Blvd	Mountain View	Potential Bike Ped Undercrossing	N
Caltrain & Central Expressway	Bernardo Avenue	Sunnyvale/ Mountain View	Potential Bike Ped Undercrossing	Y
Caltrain & Monterey Rd	Caltrain Capitol Station	San Jose	Potential Bike Ped Bridge or Undercrossing	N
Coyote Creek	St. John Street	San Jose	Potential Bike Ped Bridge	N
Coyote Creek	Phelan Avenue	San Jose	Potential Bike Ped Bridge	Y
Coyote Creek	Miguelita Creek/ Watson Park	San Jose	Potential Bike Ped Bridge	Y
I-280	John Mise Park	San Jose	Potential Bike Ped Bridge	Y
I-880	Charcot Avenue	San Jose	Roadway Extension/ Overcrossing	Y
Los Gatos Creek & SR 17	Nino Way/ Ohlone Court	Los Gatos	Potential Bike Ped Bridge	N
Los Gatos Creek & SR 17 & VTA Light Rail	Railway Ave/ Campbell Technology Parkway	Campbell	Potential Bike Ped Bridge	Y
Montague Expressway	Main Street/ Milpitas BART Station	Milpitas	Potential Bike Ped Bridge	N
San Tomas Expressway	Latimer Avenue	Campbell	Potential Bike Ped Bridge	N
SR 17	Blossom Hill Road	Los Gatos	Potential Bridge Widening or Standalone Bike Ped Bridge	N

Table 6-3: Planned Bicycle Bridge/Undercrossings (Continued)

Barrier	Crossing	Jurisdiction	Description	ABC?
SR 17	Near Lexington Reservoir County Park	County Parks	Potential Wildlife Bridge with Bike Ped Path	Y
SR 85	Mary Ave N. of Stevens Creek Blvd	Cupertino	Potential Bike Ped Bridge	Y
SR 85 & Stevens Creek	Remington Drive	Mountain View/ Sunnyvale	Potential Bike Ped Bridge	Y
SR 237	West Channel Trail	Sunnyvale	Potential Bike Ped Undercrossing	N
Stevens Creek Blvd	Carmen Road	Cupertino	Potential Bike Ped Bridge	N
Union Pacific Railroad	Snyder-Hammond House	Cupertino	Potential Bike Ped Bridge	N
Union Pacific Railroad	Guava Court/ Fredericksburg Dr	Saratoga	Potential At-Grade RR Crossing	N
US 101	San Francisquito Creek	East Palo Alto/ Palo Alto	Potential Bike Ped Bridge	Y
US 101	Old Gilroy Street	Gilroy	Potential Bike Ped Bridge	N
US 101	IOOF Avenue	Gilroy	Roadway Extension/ Overcrossing	Y
US 101	Las Animas Avenue	Gilroy	Roadway Extension/ Overcrossing	Y
US 101	Adobe Creek Bridge	Palo Alto	Potential Bike Ped Bridge	N
US 101	Ahwanee Avenue	Sunnyvale	Potential Bike Ped Bridge	N
US 101	West of Shoreline Blvd	Mountain View	Potential Bike Ped Bridge	Y
US 101	Coyote Creek	San Jose	Potential Bike Ped Undercrossing	N
US 101 & SR 237 & VTA Light Rail	Mary Avenue	Sunnyvale	Roadway Extension/ Overcrossing	Y
VTA Light Rail & Tasman Dr	West Channel Trail	Sunnyvale	Potential Bike Ped Undercrossing	N

Source: VTA, Member Agency Interviews

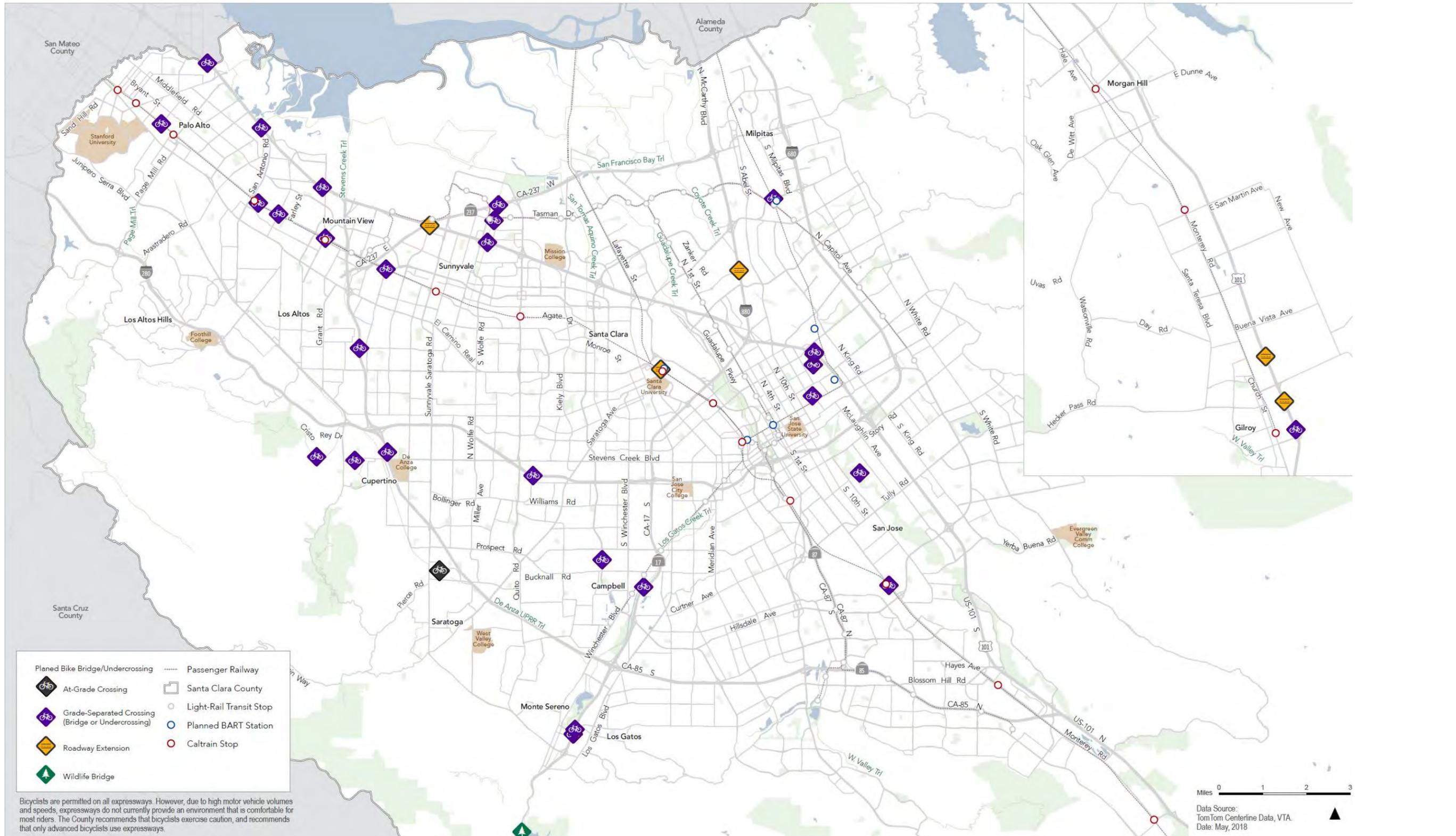


Figure 6-2: Planned Bicycle Bridges, Undercrossings, and Roadway Extensions



7. Education and Encouragement Programs

While bicycle infrastructure makes it possible to get around by bicycle, education and encouragement programs help people choose to bike and to bike safely. There are numerous ongoing bicycle education and encouragement programs in Santa Clara County. They are delivered by stakeholders such as the County Department of Public Health, the Silicon Valley Bicycle Coalition, the Almaden Valley Cycling Club, local law enforcement, and local agencies. VTA currently funds several of these efforts and delivers some limited programs.

This chapter describes:

- Education and encouragement efforts currently underway within Santa Clara County
- New opportunities for VTA, and VTA's potential role
- A framework for development of a countywide education/encouragement program that could be delivered by VTA and the County Department of Public Health

Summary of VTA Opportunities

VTA has various opportunities to enhance bicycle education and encouragement efforts across Santa Clara County. **Table 7-1** summarizes these opportunities. VTA's potential level of involvement is broken into three categories:

Fund: VTA provides funds to Member Agencies to deliver programs.

Manage: VTA takes an active role in delivering programs to the public.

Support: VTA works with Member Agencies and other partners to publicize activities, provide technical assistance, provide in-kind donations, or coordinate transit operations. Programs are led by Member Agencies or other entities.

VTA is currently involved in several education and encouragement programs listed in this chapter, primarily as a funding partner or supporting agency. Moving forward, VTA's role in delivering programs will likely expand. Recently, VTA carved out dedicated funding from 2016 Measure B to support bicycle and pedestrian education and encouragement programs. The majority of the funding will go to Member Agencies to help support their efforts. A portion will be reserved for countywide programs, delivered jointly by VTA and the County Department of Public Health. Many of the programs described in this chapter could be considered for a countywide program.

Since this chapter focuses on programs appropriate for delivery at a countywide level, it does not include all activities of specific employer groups or jurisdictions. VTA recognizes that local education and encouragement efforts delivered by Member Agencies are integral to increasing bicycling mode share and safety and will support these efforts through 2016 Measure B funding.



Table 7-1: Summary of VTA’s Potential Role in Countywide Bicycle Programs

Program Type	Program	VTA’s Potential Role		
		Fund	Manage	Support
Safety Education and Training	Safe Routes to School	•		•
	Vision Zero	•	•	•
	Violators Diversion Programs			•
	Bicycle Laws, Safety Tips, and Behavior Change Campaigns	•	•	•
	League Cycling Instructor (LCI) Trainings	•	•	•
	Safety and Education Classes	•		•
	Bus Operator Training		•	
Promotional Programs and Events	Bike Pool			•
	Open Streets Events	•		•
	Bike to Work/School/Shop Days	•		•
	Special Bicycle Events			•
Bicycle Maps and Wayfinding	Bicycle Wayfinding	•	•	•
	Bicycle Maps and Routing Tools	•	•	•
Other Education/Encouragement Resources	Bicycle and Pedestrian Advisory Committees		•	•
	Employer Transportation Demand Management	•	•	•
	Helmet/Bicycle Light Giveaways	•		•
	Bicycle Repair	•	•	•

Safety Education and Training

Safety education and training includes direct delivery of programs to train new bicycle safety instructors, providing classroom and on-the-bike courses, and coordinating a consistent safety message across local jurisdictions. Many of the initiatives highlighted here are nationally recognized, broad approaches aimed at teaching children and adults about bicycle safety.

Safe Routes to School

Safe Routes to School (SRTS) programs encourage youth and their families to walk or bike to school to improve safety, health, air quality and the environment. Students from diverse backgrounds from across the County learn age-appropriate traffic safety skills through classroom activities, assemblies, and by participating in practical hands-on bicycle riding clinics (aka “rodeos”).

Existing Examples: Nearly every city in the county and the Santa Clara County Public Health Department coordinate SRTS (also referred to as Walk and Roll) programs.

VTA Role: Fund, support.

Expand existing countywide SRTS Providers Group to include all Member Agencies delivering SRTS programs.

Work with County Public Health Department to facilitate coordinated activities, messaging, and data collection.



*Students learn about safe bicycling at Myerholz Elementary School in San Jose
Photo: San Jose Safe Routes to School*

Vision Zero

Vision Zero is a program adopted by cities across the U.S. and internationally that aims to eliminate traffic-related deaths and severe injuries. Bicyclist and motorist education and safety messaging is often included in a Vision Zero initiative, complemented by equitable enforcement practices.

Existing Examples: The Silicon Valley Bicycle Coalition developed a [toolkit](#) that outlines key steps policymakers can take to adopt and implement a Vision Zero policy and plan. Within the toolkit are educational and promotional strategies to increase bicycle safety.

San Jose adopted a [Vision Zero action plan](#) in April 2015, which encourages improvements on corridors that have the greatest impact on people walking, bicycling, motorcycle riding, and driving.



In late 2017, Sunnyvale began development of a Vision Zero plan. Mountain View plans to develop a Vision Zero policy and program in 2018.

VTA Role: Fund, Manage, Support

Support the development of Vision Zero initiatives by cities in Santa Clara County through funding of Vision Zero planning and analysis efforts, and prioritizing safety benefits in competitive grant criteria.

Collaborate with local jurisdictions to build safety improvements along CCBCs and in areas with high transit ridership.

Lead a countywide Vision Zero analysis to help guide safety programs and infrastructure improvements at the jurisdiction level.

Violators Diversion Programs

Traffic Diversion programs give bicyclists the option to pay a reduced fine for a violation if they attend a bicycle education class. Programs may be youth or adult oriented. These programs were formalized by California Assembly Bill 902 in September 2015.

Existing Examples: The Santa Clara County Public Health Department, along with participating local law enforcement agencies, offers a juvenile traffic diversion program for youths under age 18 who have been cited for a non-motor vehicle violation. Youth, along with a parent/guardian, attend a two-hour educational class that covers relevant laws and traffic safety. The class is offered in lieu of paying the citation's fine.

Stanford University's Department of Public Safety offers a Bicycle Diversion Program for individuals affiliated with Stanford University.

VTA Role: Support. Encourage city leaders and law enforcement agencies to adopt adult bicycle diversion classes and promote their availability to support education over penalty; encourage non-participating cities to become involved in the existing youth diversion program.

Bicycle Laws, Safety Tips, and Behavior Change Campaigns

Sharing bicycle laws and safety tips can increase motorist and bicyclist awareness of their rights and responsibilities on the road. Campaigns that are data-driven and use polished, proven messaging and imagery can encourage bicyclists, drivers and pedestrians to respect each other and travel safely and courteously.

Existing Examples: VTA currently describes bicycle laws and tips on its website. The website includes a video demonstration of how to use bike racks on VTA buses, a summary of bicycle laws, and key safety tips. The [Santa Clara Valley Bikeways Map](#) also provides tips for commuting by bicycle and bringing bicycles on transit. The map is printed in Spanish and English.

The Santa Clara County Public Health Department's website provides educational safety tips, videos, and resources for parents and youth.

The City of San Jose's nationally recognized [Street Smarts](#) program works with schools, neighborhoods, seniors, and other communities to improve safety through driver, pedestrian, and bicyclist behavior classes. The Street Smarts program also promotes public awareness of traffic safety through roadway banners, bumper stickers, and pamphlets. Program materials are available to other cities as well.



VTA Role: Fund, manage, support.

Continue to share bicycle laws and safety tips. Develop instructional videos in multiple languages about how to use bicycle accommodations on other VTA services, in addition to the current video demonstrating VTA bus bike racks. Enhance the website to include links to bicycle-related policies for Caltrain, ACE, Greyhound, BART, and Amtrak. Develop a high-quality, data driven countywide traffic safety campaign intended to support behavior change.

League Cycling Instructor (LCI) Trainings

The League of American Cyclists provides a nationally recognized train-the-trainer curriculum for bicycle safety classes. League Cycling Instructor (LCI) trainings are intense three-day seminars that certify instructors to teach Smart Cycling classes to children and adults. Classes teach people to feel more secure getting on a bicycle, to learn how to “drive” a bicycle, and to acquire the skills to ride safely and legally in traffic. LCIs are members of the League of American Bicyclists and are covered by the League’s liability insurance.

Existing Examples: Santa Clara County Department of Public Health has used grant funding to organize and deliver LCI trainings. Graduates of the course teach bike rodeos in Safe Routes to School programs throughout the County.

In 2017, VTA hired a contractor to deliver a second round of LCI training to support school-based safety training.

VTA Role: Fund, manage, support.

Fund and/or contract for trainings to increase the number of certified bicycle instructors in the County.

Safety and Education Classes

Communities, businesses, and campuses in Santa Clara County offer a variety of resources for adults looking to improve their bicycling skills. These include online tips, brown bag lunch presentations, and in-depth on-bicycle training opportunities. These programs offer different ways for people to develop the skills and confidence required to ride. At the community level, this begins with bicycle-safety education being a routine part of public education.

Existing Examples: The [Silicon Valley Bicycle Coalition](#) offers corporate, family, and adult bicycling classes; introductory classes for urban bicycling; and summer camps for children. Their website provides educational materials on roadway signs and markings, fact sheets, videos, and bicycling tips.

The [Almaden Cycle Touring Club](#) leads an adult bicycle academy twice a year, comprised of two six-week sessions. The curriculum includes lectures, demonstrations, and supervised rides.

VTA Role: Fund, Support Fund and/or contract for classroom-based and on-the-bicycle skills classes for youth, adults, families, and urban bicyclists across Santa Clara County. Recommend courses are offered in multiple languages. Link to other organizations offering classes on the website.

Offer relevant bicycle education courses to VTA employees.

Bus Operator Training

Bus operator training teaches bus drivers safe practices for interacting with bicyclists on the road. Training may

include formal classes or sharing videos and written materials.

Existing Examples: Newly hired VTA bus operators are required to attend eight weeks of intensive training. All bus operators must also attend ongoing annual training courses. All trainings address pedestrian and bicyclist safety.

VTA Role: Manage. Continue to integrate new best practice trainings for bus operators into VTA's safety training.

Promotional Programs and Events

Promotional programs and events encourage people to take up bicycling and encourage current bicyclists to ride more. These programs create a community around bicycling and support culture change.

Bike Pool

Bike Pool is a coordinated commuter program that links bicyclists with similar destinations to ride together. It encourages bicycling as a commute mode, while making it social and safe to ride to work.

Existing Examples: [Lupebikepool](#) San Jose is a free morning bicycle group-commute program along the Guadalupe River Trail in San Jose. Participants can ride to work with coworkers and neighbors. The bike pool is scheduled weekly and is led by experienced and trained ride leaders.

In 2016, the Silicon Valley Bicycle Coalition organized Bikepool Stevens Creek Trail. The bike pool operated during the winter and spring for evening commutes along the Stevens Creek Trail.

VTA Role: Support. Actively promote bike pool programs by encouraging employees to participate, and sharing information on the VTA website and social media.



*Lupebikepool riders prepare to depart for their 7-mile commute up the Guadalupe River Trail.
Photo: Richard Masoner*

Open Streets Events

Open streets events close down miles of roadway for one day and open the streets up to bicyclists, pedestrians, skaters, joggers and others. These events help build a culture and inclusive community around bicycling by connecting residents to other bicyclists in the area and demonstrating local support for safe streets.

Existing Examples: [Viva CalleSJ](#) is a free annual event in which several miles of San Jose roadways are closed to vehicular traffic, allowing people to bicycle, walk, skate, play, and explore the streets in a safe and fun environment. It is organized by San Jose's Parks, Recreation, and Neighborhood Services Department. More than 30,000 people participated in the September 2018 event. San Jose is looking to expand beyond an annual occurrence.

VTA supports Viva CalleSJ by rerouting buses, providing safety officers at locations where the route crosses light rail tracks, providing advertising space on VTA vehicles, and hosting booths at the events.

Other communities are looking into hosting their own open streets events.

VTA Role: Fund, support. Continue to promote open streets events and align flexible funding such as 2016 Measure B to support events. Continue to work with local jurisdictions to coordinate transit service and events. Work toward monthly events throughout the County. Encourage multi-cultural organizations to participate in the event and ensure event information is developed in multiple languages.



*VTA has provided in-kind advertising space and booths at San Jose's Viva CalleSJ open streets event since 2015.
Photo: VTA*

Bike to Work/Shop/School Days

One-day events that promote bicycling to school or work attract a large number of participants. These events can demonstrate that bicycling to work, school, or shopping is a feasible alternative to driving.

Existing Examples: [Bike to Work Day](#) is a national one-day event in May that encourages people to try bicycle commuting as an alternative to driving. Silicon Valley Bicycle Coalition organizes and promotes Bike to Work Day for the nine-county Bay Area. VTA helps fund Bike to Work Day in Santa Clara County.

[Bike to School Day](#) is an annual one-day event where students are encouraged to bicycle to school. The day brings attention to bicycle safety and promotes physical activity and health. It coincides with National Bike Month in May. It is supported by local Safe Routes to School programs.

[Bike to Shop Day](#) is an annual event in May that encourages people to bicycle to stores and restaurants in Silicon Valley. It was established in 2014 by a local bicycle advocate and has been promoted by the Silicon Valley Bicycle Coalition. In 2017, over 130 businesses in 15 cities offered incentives and promotions to customers arriving by bicycle.

VTA Role: Fund, support. Continue to fund Bike to Work Day in Santa Clara County. Actively promote community-wide bicycle encouragement events through social media, sharing with the VTA Bicycle and Pedestrian Advisory Committee, and providing in-kind advertising space on transit vehicles. Continue to host an energizer station and annual VIP ride for Bike to Work Day.

Other Special Bicycle Events

Other special events, like themed group rides and festivals promote a culture of bicycling and support safe streets.

Existing Examples: [San Jose Bike Party](#) coordinates monthly themed rides for

bicyclists of various ages and abilities. The goal of the rides is to build community through bicycling.

[Silicon Valley Bikes! Festival and Bicycle Show](#) is an annual, family-friendly event that celebrates all aspects of bicycling through entertainment, food, and activities. It is intended to bring together all types of bicyclists and their families: racing, road, recumbent, mountain, BMX, cargo biking, custom cruiser, fixed-gear, low rider, recreation and bike polo communities. It was established in 2014, and is supported by History San Jose, Silicon Valley Bicycle Coalition, the Mineta Transportation Institute, and a variety of business partners. Over a thousand people attended the 2017 festival. VTA has provided a booth and a bus at the event since its inception.

VTA Role: Support. Continue to staff booths at major community events. Actively promote community-wide bicycle encouragement events through social media, the VTA website, and sharing with the VTA Bicycle and Pedestrian Advisory Committee. Provide information in multiple languages.



*San Jose Bike Party hosts themed rides at least once a month and sees over a thousand participants at its most popular events.
Photo: Richard Masoner*

Bicycle Maps and Wayfinding

Bicycle maps and wayfinding encourage bicycling by making it easier for bicyclists to find their way around. Maps and wayfinding provide information to the community about the location of bicycle infrastructure and routes, as well as the location of nearby bicycle destinations, including bike shops and bike parking.

Bicycle Maps and Routing Tools

A bicycle map is one of the items most frequently requested by both commuter and recreational bicyclists. Maps highlight primary bicycle-friendly routes and show bicycle facility types (e.g., bicycle lane, bicycle route, bicycle path) and roadway types (e.g., arterial, residential street). Many maps also include detailed bicycle-as-driver safety tips. Bicycle maps and trip planning sites can remove barriers to bicycling by showing residents how to access safe and comfortable routes.

Existing Examples: VTA produces a [countywide bicycle map](#) in online and print versions. The reverse side of the map includes safety tips and information about combining bicycling with transit. Maps are available in English and Spanish.

Silicon Valley Bicycle Coalition provides a [list of local bicycle maps](#) on their website.

Santa Clara County Parks provides an [overview of 17 parks that have bicycle access](#).

[Virtual Bike Route Scouts](#), a service provided by the Silicon Valley Bicycle Coalition, develops a free personalized bicycle route map that incorporates turn-by-turn directions, total distance,

estimated travel time, and other pertinent information based on one's riding preferences.

[VTA's multi-modal trip planner](#) allows people to plan a trip that includes multiple modes. It has the ability to combine bicycle directions with transit directions.

VTA Role: Fund, manage, support. Continue to update and distribute the Countywide Bicycle Map, both online and in print, in multiple languages. Promote Virtual Bike Route Scouts online. Continue to highlight bicycle parking locations near transit stops on the VTA website and bicycle map. Continue to refine and develop the VTA Trip Planner.

Bicycle Wayfinding

A bicycle wayfinding system consists of comprehensive signing and/or pavement markings to guide bicyclists to their destinations along preferred bicycle routes. Signs are typically placed at decision points along bicycle routes and at key destinations.

Existing Examples: City of San Jose Parks, Recreation, and Neighborhood Services department installs wayfinding signage along the city trails. Wayfinding includes mileage markers, directions to connector trails, transit, food, restrooms, and trail etiquette signs.

City of Santa Clara provides wayfinding along the San Tomas Aquino/Saratoga Creek Trail. The city continues the wayfinding through an on-street portion of the trail with custom pavement stencils, green paint, trail signs, and kiosks.

VTA Role: Fund, manage, support. Coordinate with jurisdictions to develop consistent guidelines for city- and

countywide bikeway trail/route signage in multiple languages.

Encourage Member Agencies to improve wayfinding signage to better link on-street bikeways and trails to public transit and to key destinations within their community.



Wayfinding helps guide people through the physical environment. City of Santa Clara's San Tomas Aquino/Saratoga Creek Trail includes trail maps like this one, obvious and inviting trail entrances, and unique pavement markings for on-street portions. It is all bound together with a blue wave symbol, seen integrated into the base of this sign.

Photo: VTA



Other Education and Encouragement Resources

There are a variety of other education and encouragement programs that support bicycling. These include advisory committees and transportation demand management programs, among others.

Bicycle and Pedestrian Advisory Committees

A Bicycle and Pedestrian Advisory Committee (BPAC) is comprised of volunteers that may be appointed by a City Council to advise on all bicycle-related matters. BPAC members can be resources for community members and represent their voices in local government.

Existing Examples: Every city in Santa Clara County has a BPAC or other similar entity that meets regularly to discuss the city's active transportation needs.

[Santa Clara County and VTA have a joint BPAC](#) that meets monthly and consists of representatives from each of the local BPACs. The VTA BPAC's dual mission is to a) provide expertise and guidance to the Board of Directors on promoting and enhancing non-motorized transportation opportunities throughout Santa Clara County and to 2) serve as liaison between VTA and the Member Agency bicycle and pedestrian advisory committees.

VTA Role: Manage, support. Continue to hold regular VTA Bicycle and Pedestrian Advisory Committee meetings and support the BPAC in its mission. Encourage diverse participation in BPAC to ensure the perspectives and

participants are representative of the larger Santa Clara County community.

Employer Transportation Demand Management

Transportation demand management (TDM) consists of strategies or measures to encourage sustainable travel. TDM focuses on providing tools and incentives to make it easier to take advantage of transportation options and shift trips from driving alone in private vehicles to transit, biking, walking, or other more efficient and sustainable modes of travel.

Existing Examples: Many employers in Silicon Valley actively promote bicycle commuting for their employees through a variety of means. These range from providing basic amenities such as secure bicycle parking, changing rooms, and showers to more innovative solutions such as loaning employees electric bicycles, running contests, and funding bicycle infrastructure improvements along key commute corridors.

In 2015, Google published the [Google Bike Vision Plan for North Santa Clara County](#). The document analyzes how stressful it is to bicycle to its north Bayshore campus in Mountain View, and identifies areas for improvement.

VTA Role: Fund, manage, support. Continue to recommend TDM strategies when reviewing large development proposals. Coordinate periodic sharing forums on transportation demand management initiatives among large employer groups. Continue to support and expand TDM programs for VTA employees. Support a policy to reimburse employees and committee members for work or committee-related bicycle travel.

Helmet/Bicycle Light Giveaways

Helmet and light giveaway events provide free or discounted bicycle safety materials to cyclists. These events are also an opportunity for Member Agencies or local nonprofits to share safe bicycling behaviors or distribute other bicycle materials, such as local maps

Existing Examples: The Department of Public Health offers a limited number of free bicycle helmets to children and youth under age 18 throughout the County.

San Jose has implemented annual winter light and helmet giveaways with members of the city's Bicycle and Pedestrian Advisory Committee.

As part of Bike to School day in Santa Clara, the city has hosted raffles for safety-related giveaways.

VTA Role: Fund, support. Permit flexible funding sources, like 2016 Measure B, to be used to purchase safety equipment to give away to youth and others, especially in underserved communities. Work with Member Agencies to share best practices for safety equipment giveaways.

Bicycle Repair

Bicycle repair stations may be permanently installed, or may be implemented temporarily as part of local events. These stations allow a free and convenient bicycle repair alternative for those who need to make minor bicycle repairs.

Existing Examples:

The [San Jose Bike Clinic](#) is a volunteer-run do-it-yourself community bicycle workshop in downtown San Jose that provides a shared space for bicycle

repair and education. Its website contains how-to videos on bicycle maintenance and repair.

The Bay Area BikeMobile is a mobile bike shop that hosts bicycle repair clinics at schools, libraries, recreation centers, and community events across the San Francisco Bay Area. These events engage participants in a hands-on repair process to help them become more confident when making future repairs on their own. Additionally, the BikeMobile staff promote safe riding, teach beginners how to ride without training wheels, and give away refurbished bicycles.

VTA Role: Fund, manage, support. Explore the option of expanding mobile bicycle repair services available to Safe Routes to Schools programs in Santa Clara County. Schedule mobile bicycle repair stands at VTA events. Continue donating bicycles to nonprofit earn-a-bike bicycle repair shops. Encourage these services in underserved communities and parts of Santa Clara County with fewer bicycle shops.



*VTA has worked with local bicycle shops to provide free repair services at special events.
Photo: VTA*



8. Costs, Funding, and Implementation

This plan sets the foundation for a network of Cross County Bicycle Corridors (CCBCs) and Across Barrier Connections (ABCs) that are safe, convenient, and connected, supported by education and encouragement programs that enable people of all ages and abilities to easily bike to work, school, shopping, transit, and elsewhere.

The plan identifies 950 miles of CCBCs, 280 unbuilt ABCs, ten candidate superhighway corridors, and over a dozen potential education and encouragement programs that VTA could support.

Implementing the plan requires VTA to continue communicating, collaborating, and partnering with Member Agencies and other stakeholders.

This chapter describes:

- The role VTA, Member Agencies, and other stakeholders will play in implementing the Cross County Bicycle Corridors and Across Barrier Connections
- The cost of implementation and projected revenue available to meet the plan's recommendations.
- General approaches to project delivery.
- Specific actions VTA will take to support the plan's vision, goals, and policies.

Roles and Responsibilities

VTA influences bicycling in the County in many ways: through funding, policy decisions; technical assistance to local

jurisdictions; and coordination of bicycle improvement efforts of local jurisdictions.

VTA also directly delivers bicycle infrastructure projects—typically bridges and undercrossings—and integrates bicycle infrastructure into its capital projects that touch local roads.

With the passage of 2016 Measure B, which dedicates funding to a countywide education/encouragement program, VTA will begin to take an active role in delivering non-infrastructure programs.

VTA's role in implementing the Countywide Bicycle Plan consists of:

- Promoting plan recommendations to Member Agency staff, elected officials, the public, other stakeholders
- Encouraging Member Agency staff to incorporate recommendations into local planning documents and conditions of development
- Seeking opportunities to construct CCBCs and ABCs
- Requesting that new developments construct CCBCs or ABCs
- Aligning VTA-administered funding sources to prioritize projects and programs in the plan
- Partnering with Member Agencies to fund, design, and construct selected projects
- Partnering with the County Department of Public Health to deliver a countywide education and encouragement program, funded by 2016 Measure B.

Other stakeholders, including Member Agencies, Caltrans, County Public Health Department, County Parks and



Recreation Department, Santa Clara Valley Water District, and bicycling advocacy organizations, among others, also play a critical role in implementing the Countywide Bicycle Plan. Meeting our vision requires stakeholders' ongoing, exceptional efforts to improve bicycling. These stakeholders are primarily responsible for planning, designing, and constructing bicycle facilities and for carrying out education and encouragement programs.

Member Agencies and other agency stakeholders can help implement the Countywide Bicycle Plan by:

- Incorporating recommendations into local plans and Capital Improvement Programs
- Consulting the plan when reviewing development proposals
- Using repaving as an opportunity to implement CCBCs and improve ABCs
- Incorporating plan recommendations into larger capital projects
- Seeking competitive grant funding to build CCBCs and improve ABCs
- Seeking opportunities to partner with VTA to deliver selected projects

Elected officials, BPAC members, the public, advocacy groups, and other stakeholders can support the plan by:

- Selecting projects or programs to champion
- Promoting the plan's vision and recommendations to social networks
- Working collaboratively with VTA and Member Agencies to deliver projects and programs

Costs

Using rough assumptions, the order-of-magnitude cost for implementation of the priority Cross County Bicycle Corridors and priority Across Barrier Connections is estimated at approximately \$747.5 million.¹⁸ The cost of implementing the entire plan, including both priority and non-priority projects is estimated at \$1.8 billion.

Table 8-1 and **Table 8-2** summarize estimated costs for ABCs and CCBCs, respectively. To estimate costs, VTA assumes cycle tracks will be constructed on all priority on-street CCBCs, bicycle lanes will be constructed on all non-priority on-street CCBCs, all proposed off-street CCBCs will be constructed as bicycle paths, and site-specific improvements at all ABCs. Some ABCs will be addressed by highway interchange projects or planned roadway extensions currently under development by VTA or Member Agencies. The costs of these projects are not included in the ABC cost estimates. **Appendix 8-1** lists cost assumptions.

Moving forward, not all of the cost must be borne by funds dedicated to bicycle infrastructure. Many CCBCs and ABCs can be addressed by incorporating quality bicycle and pedestrian infrastructure into other transportation projects, including street repaving, freeway interchange reconstruction, grade separations, and new roadway connections.

¹⁸ Costs are planning-level estimates, and should be seen as rough figures. Specific bicycle infrastructure improvements will be determined by Member Agencies and community preferences, and will be sensitive to the local context. As a result, actual costs may vary significantly.



Table 8-1: Estimated Cost of Addressing ABCs, by Category and Priority Status

All ABCs			
Category	Number	Cost	Notes
1: Inadequate Roadway Crossings	107	\$91 million	
2: Unfriendly Freeway Interchanges	82	\$41 million	<i>Cost for interim improvements only. Cost does not include projects that will be addressed by near-term interchange reconfiguration projects.</i>
3: Long Distance Between Crossings	91	\$910 million	<i>Cost does not include projects where a planned roadway extension will provide bicycle access across the barrier.</i>
Total All ABCs		\$1.042 billion	
Priority ABCs			
Category	Number	Cost	Notes
1: Inadequate Roadway Crossings	1	\$60 million	<i>Grade separation of Sunnyvale Avenue and Caltrain-bicycle/pedestrian undercrossing alternative. Cost provided by City of Sunnyvale.</i>
2: Unfriendly Freeway Interchanges	13	\$6.5 million	<i>Cost for interim improvements only. Cost does not include projects that will be addressed by near-term interchange reconfiguration projects.</i>
3: Long Distance Between Crossings	25	\$250 million	<i>Cost does not include projects where a planned roadway extension will provide bicycle access across the barrier.</i>
Total Priority ABCs		\$316.5 million	

Cost estimates include the typical materials and labor, as well as traffic control, mobilization, and miscellaneous contingencies. Cost estimates take into account: (1) Planning/environmental work; (2) PS&E design; and (3) Construction administration.

Appendix 8.1 provides more detail.



Table 8-2: Estimated Cost of Building out CCBCs, by Type and Priority Status

All CCBCs	Miles Unbuilt/ Unimproved	Cost Per Mile ¹	Total Cost
Off-Street	150	\$3 million	\$450 million
On-Street - cycle track	220	\$800,000	\$176 million
On-Street - lanes	250	\$600,000	\$150 million
Total	620		\$776 million
Priority CCBCs	Miles Unbuilt/ Unimproved	Cost Per Mile ¹	Total Cost
Off-Street	85	\$3 million	\$255 million
On-Street - cycle track	220	\$800,000	\$176 million
Total	305		\$431 million

1 Cost per mile assumes paved bicycle path for all unbuilt off-street CCBCs, cycle tracks for all priority on-street CCBCs, and bicycle lanes for all unbuilt non-priority on-street CCBCs. Using these assumptions, existing bicycle routes are included in the “unbuilt/unimproved” mileage. Appendix 8.1 provides more detail on cost assumptions.

Revenue Sources

As the Congestion Management Agency for Santa Clara County, VTA is responsible for allocating state-level gasoline tax revenues and county-level sales tax revenues collected for transportation improvements. VTA also distributes Santa Clara County’s share of federal and state transportation funds allocated to the Metropolitan Transportation Commission (MTC), which coordinates transportation investments as the Bay Area’s metropolitan planning organization and regional transportation planning agency (RTPA).

From 2008 to 2016, VTA allocated almost \$115 million in total funding for bicycle infrastructure, programs, and planning from a number of sources, as

summarized in **Table 8-3**. The majority of the funding was allocated through the One Bay Area Grant Program (OBAG), which is programmed by MTC, but administered and prioritized in Santa Clara County by VTA. OBAG includes Congestion Management and Air Quality (CMAQ) funding, the Surface Transportation Program, and the Regional Improvement Program. VTA’s Safe Routes to School program, Vehicle Emissions Reductions Based at Schools (VERBS), is funded with CMAQ money through the OBAG program.

State and federal funding streams, timing, award amounts, and eligibility requirements are likely to change over the life of this plan in response to changes in priorities and total revenue available. However, one can project



rough revenue estimates assuming the existing funding sources remain stable, and adding in projected revenues from 2016 Measure B.

VTA's average annual allocation for bicycle infrastructure over the last 9 years was \$12.6 million. 2016 Measure B is projected to add an \$8.3 million annually for bicycle and pedestrian projects and programs over the next thirty years.

Based on these figures, VTA's revenue stream to fund bicycle and pedestrian projects and programs is anticipated to be \$226 million for the ten-year plan horizon.

This number is a conservative estimate. It represents only the funding that VTA administers. To deliver projects and programs identified in the Countywide Bicycle Plan, it is essential that VTA and Member Agencies leverage local funding to bring in outside funds. Member Agencies and VTA are eligible for numerous other competitive grant programs administered through regional, state, and federal agencies.

The largest of the competitive grant programs is the Active Transportation Program (ATP). This competitive funding program includes a statewide and regional call for projects, run by Caltrans and the MTC. California's recently enacted gas tax increase (Senate Bill 1) is projected to triple the amount of funding available in future ATP cycles. In the first three ATP cycles, Santa Clara County jurisdictions' applications generally fared very poorly, due to stiff competition. However, with the increase in funding to ATP, more local projects could be selected to receive funding.

Appendix 8.2 lists grant and formula funding sources VTA and its Member Agencies can use to build out the countywide bicycle network and implement education and encouragement programs.

Capital Project Delivery

To deliver CCBCs and ABCs efficiently, VTA and Member Agencies should use a variety of strategies, beyond simply seeking competitive grant funding for standalone bicycle projects. Innovative new delivery approaches, like quick build/interim design, can allow agencies to test out a new design before committing, measure its effectiveness, and potentially generate support for new projects. Pavement management programs can be used to deliver paint-only solutions, such as bicycle lanes, green paint, and other markings. Bicycle projects and improvements for bicyclists can be delivered in conjunction with other transportation projects, such as freeway interchange reconstruction. New developments, particularly larger ones, can build new bicycle infrastructure as mitigations, or pay into a fund to construct transportation improvements. Finally, VTA can take a role in leading projects of countywide significance, including those that bridge major barriers, cross multiple jurisdictions, or improve access to major transit stops.

Quick Build/Interim Design Projects

Bicycle improvements, particularly those that require reallocating space from motorists, or those with costly or innovative treatments, can take years to design, fund, and construct.

Table 8-3: VTA Bicycle Programming by Funding Stream 2008-2016

Year	Sources					
	Congestion Management & Air Quality (CMAQ) ¹	Regional Improvement Program	Surface Transportation Program	Transportation Fund for Clean Air ²	Transportation Development Act Article 3 (TDA3)	Other
2008	\$0	\$0	\$0	\$184,000	\$1,410,134	\$0
2009	\$4,812,827	\$4,120,000	\$0	\$694,500	\$2,898,201	\$0
2010	\$0	\$0	\$0	\$320,275	\$1,091,563	\$0
2011	\$17,766,664	\$3,998,000	\$4,574,710	\$288,650	\$1,105,109	\$6,348,950
2012	\$0	\$0	\$0	\$102,604	\$1,627,525	\$0
2013	\$39,734,255	\$5,850,000	\$1,845,937	\$253,905	\$2,714,246	\$0
2014	\$0	\$0	\$0	\$614,816	\$2,863,062	\$0
2015	\$2,127,977	\$0	\$0	\$1,023,368	\$2,527,883	\$0
2016	\$0	\$0	\$0	\$1,247,390	\$1,995,593	\$0
Total by program	\$64,441,723	\$13,968,000	\$6,420,647	\$4,729,508	\$18,233,316	\$6,348,950

Notes:

1. CMAQ funds are currently allocated via One Bay Area Grant (OBAG) and Vehicle Emissions Reductions Based at Schools (VERBS) programs.

2. Some TFCA funds are administered via the VERBS program.

Sources: VTA 2016; Fehr & Peers, 2017.

Often, this creates a gap between the community outreach during the planning process and the project's implementation, leading to a loss of engagement and excitement among the public. Meanwhile, the existing conditions, which may not support bicycling, are unchanged.

Quick build, or interim design, projects provide a rapid response to safety concerns for bicycle riders. They can also be used to maintain community engagement or to test a preferred design alternative before committing to a long-term improvement. Quick build projects use temporary, low-cost materials, which allow projects to be installed quickly and inexpensively. Where projects do not meet their goals and expected outcomes, installations can easily be modified or removed. The quick build approach also facilitates project phasing: improvements can be extended over longer distances or made more durable as additional funding is available.

Quick build/interim design projects have been used by several agencies in the San Francisco Bay Area to pilot new infrastructure and meet urgent safety and access needs. Locally, Morgan Hill, San Jose, and Palo Alto have tested new bicycle infrastructure through quick build or interim design projects. In some cases, the cities made the infrastructure permanent. In others, the cities decided to return to the original street layout.

In Mountain View, the city's bicycle advocacy group has demonstrated cycle tracks at community events using reusable, portable barriers. The group makes these available for other groups wishing to demonstrate similar treatments.



City of San Jose staff and volunteers install a temporary pop-up cycle track on Fourth Street to demonstrate the city's plans for a connected network of protected bikeways in downtown. The reusable, portable planter boxes were borrowed from Mountain View's local bicycle advocacy group, which loans them out for demonstrations like this one. Photo: Jessica Zenk

Relevant Project Types

As a regional technical leader, VTA can provide support for a wider use of quick-build projects in Santa Clara County. A quick-build approach is most relevant for the following types of projects:

- On-street facilities where there is an opportunity to test new configurations.
- On-street facilities where the preferred design includes a physically-separated bikeway or traffic calming elements
- On-street facilities where collision histories or other existing conditions present hazards and those hazards

could be mitigated by a quick-build design

- Projects where community concerns encourage proposed designs be tested as pilot projects
- Projects where a successful interim implementation can provide support for grant funding of more durable improvements

Integration into Pavement Management Programs

Pavement management programs can be used to quickly deliver new bicycle lanes, at reduced cost and disruption to other roadway users. Successful integration requires close communication between transportation planning and public works departments, to ensure that striping plans include new bikeways.

Member Agencies maintain streets on a rotating basis, with a handful of streets repaved or resurfaced each year. Streets are typically selected based on the quality of the pavement and traffic volumes. In some cases, cities may want to advance or delay pavement maintenance on a particular street in order to accommodate the bikeway.

Since pavement management is part of ongoing annual street maintenance, opportunities for public outreach are limited. Cities may want to make extra efforts to engage the community before delivering potentially controversial projects through pavement programs

In most cases, bicycle infrastructure delivered through repaving is limited to paint-based improvements, such as standard bicycle lanes, buffered bicycle lanes, green paint, shared lane markings, bicycle boulevard stencils, or other pavement markings. It is possible to coordinate repaving with capital.



City of Sunnyvale worked with Caltrans to install bicycle lanes on El Camino Real as part of a repaving project. Photo: VTA

improvements such as curb extensions, bus boarding islands, protected intersection treatments, or other similar improvements. Palo Alto and San Jose have done this. However, as soon as capital improvements are added to a pavement maintenance project, the delivery becomes more complex and significantly more costly. The benefits of including capital improvements in repaving activities must be balanced with the trade-offs.

Over the next thirty years, 2016 Measure B will provide an estimated \$1.2 billion in formula funds to Member Agencies for pavement maintenance. VTA requires that all projects delivered with this funding meet Complete Streets best practices. Among other things, this means that Member Agencies should look for opportunities to deliver new and improved bikeways with their repaving programs.

Relevant Project Types

Pavement programs can deliver bicycle facilities quickly and efficiently. VTA has aligned its funding sources to support this integration. The following types of



projects are most appropriate for delivery through pavement management programs:

- Bicycle improvements that rely on paint and signs only, such as bicycle lanes
- Projects that reallocate roadway space to bicyclists using paint
- Projects with limited capital improvements
- Projects that are either non-controversial, or those with community support.

Integration into Other Transportation Capital Projects

Incorporating bicycle facilities into larger transportation capital projects can reduce administration costs and leverage technical expertise and outreach activities. Ideally, bicycle-related improvements are integrated into the initial project scope, schedule, and budget for the larger project.

While many bicycle infrastructure projects can be incorporated into larger transportation projects, there are some situations where integration may not be appropriate or feasible. If a bicycle project requires permitting or environmental clearance that would delay the larger project, or if the bicycle project significantly increases the cost of the larger project, it may be better to deliver the bikeway separately. In many cases, transportation funding comes with restrictions on the types of projects that can be funded. If the funding for a larger transportation project does not permit bicycle-related infrastructure, a different funding source would need to fill the gap.

VTA has in the past, and continues to integrate bicycle infrastructure into its highway and transit-related capital

projects. VTA's Complete Streets policy, adopted by the Board of Directors in December 2017, formalizes this approach. The policy, among other things, directs VTA to see every transportation project as an opportunity to improve conditions for bicyclists, pedestrians, and transit customers.

Figure 8-1 shows corridor studies and planned highway projects led by VTA. These represent opportunities for delivering the CCBC network and priority ABCs.

Relevant Project Types

Delivering bikeways in conjunction with other transportation projects can reduce staff time and costs. Integration into larger transportation projects is most relevant for the following types of projects:

- Bicycle infrastructure within or immediately adjacent to the project footprint
- Bicycle infrastructure that can be delivered within the schedule of the larger project
- Bicycle infrastructure with permitting and environmental clearance needs compatible with the larger transportation project
- Bicycle infrastructure that does not significantly increase the cost of the larger transportation project, or that brings additional funding to fill the gap.

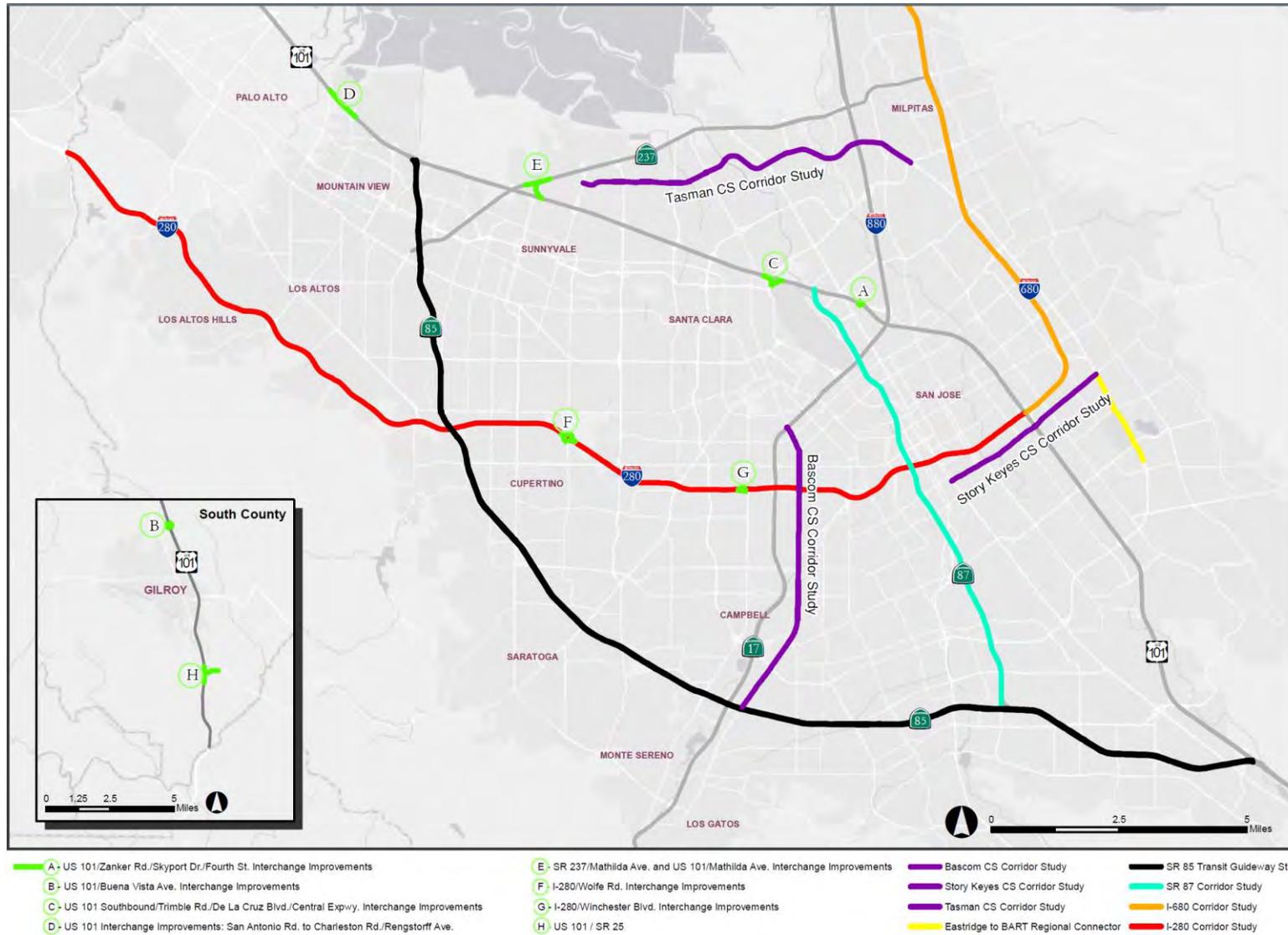


Figure 8-1: VTA Planned Projects and Corridor Studies



Integration into New Developments

Bicycle projects can be built in conjunction with new developments. They may be integrated into on-site design, immediately adjacent to the development, or in special cases, located off-site. In all cases, there should be a nexus between the impact the development has on the transportation system, and the benefits of the new bicycle infrastructure.

Through their development review process, Member Agencies frequently require new developments to build or pay for bicycle infrastructure. Some agencies require or request large developments to pay a transportation impact fee, which may be used in part to construct new bicycle infrastructure.

VTA's Land Use group reviews and engages on land developments, projects, and plans, generally those that are predicted to generate 100 or more new trips during the morning and evening commute hours. VTA considers the development's impact on the pedestrian, bicycle, and transit conditions consistent with VTA and local jurisdictions' mutual goals. As part of the review, VTA also looks for opportunities to partner with local jurisdictions and the development community to implement projects identified in VTA's various planning documents, including the Countywide Bicycle Plan. VTA reviews and engages on approximately 100 developments, projects, and plans a year.

Relevant Project Types

- Infrastructure improvements that are in an adopted plan and have the potential to mitigate increased traffic concerns related to the development.

- Improvements located adjacent to or within close proximity of the new development.

Regional Agency-Led Projects

Across California, several regional agencies have led planning and project construction within the rights-of-way of other jurisdictions, including the Alameda County Transportation Commission, the San Diego Association of Governments, and Los Angeles Metro.

As the Congestion Management Agency for Santa Clara County, VTA is similarly well-positioned to lead the planning, design, and construction of regionally significant bicycle infrastructure. VTA's staff expertise and the organization's role as a countywide transportation planning and funding agency make it well-suited for taking on innovative funding and project delivery approaches.

VTA has taken a lead role in delivering regionally significant and transit-supportive bicycle projects. These include complex, high-cost, multi-jurisdictional projects, projects that interface with VTA's property, and multi-jurisdictional studies along transit corridors. Examples include multi-jurisdictional complete streets corridor studies along Tasman, Bascom, and Story-Keyes corridors, the Santa Clara Caltrain Pedestrian Undercrossing, and the Alum Rock/Santa Clara Bus Rapid Transit Project.

Relevant Project Types

Projects of countywide significance, including many of the projects defined in this plan, are particularly appropriate for VTA to lead. Relevant project types include:

- Projects that cross jurisdictional boundaries
- Projects with technical challenges that would benefit from VTA staff expertise
- Larger projects, where VTA involvement is more cost-effective
- Complex ABCs that require coordination with multiple jurisdictions, or innovative funding strategies
- Projects that provide key bicycle connections to transit centers and train stations.

Multi-Jurisdictional Efforts to Advance CCBCs and ABCs

Collaboration is key to implementing the Countywide Bicycle Plan, and implementing CCBCs will often require multi-jurisdictional partnerships.

Improvements proposed near jurisdictional boundaries are prime candidates for collaboration.

There are already several multi-jurisdictional projects underway that advance CCBCs and address ABCs. Some examples include:

- **Peninsula Bikeway** linking Redwood City, Mountain View, and the jurisdictions between them.
- **Joint Cities Stevens Creek Trail Feasibility Study**, connecting Mountain View to Cupertino via Los Altos, Mountain View, and Sunnyvale.
- **Bascom Complete Streets Corridors**, linking San Jose, Campbell, and portions of unincorporated Santa Clara County.
- **Tasman Complete Streets Corridor**, through Sunnyvale, Santa Clara, San Jose, and Milpitas.
- **I-280/Page Mill Interim Improvements**, a partnership between Palo Alto and Los Altos Hills (with support from VTA and Caltrans).



VTA Board Members and General Manager/CEO Nuria Fernandez reveal the Santa Clara Caltrain Pedestrian Undercrossing at the Grand Opening in June 2017. VTA funded, designed, and built the undercrossing. Photo: VTA

VTA's Commitment

VTA envisions a future where:

Santa Clara County is served by a countywide bicycle network that is safe, convenient, and connected, enabling people of all ages and abilities to easily bike to work, school, shopping, transit, and elsewhere.

VTA will pursue the following actions to meet this vision and the goals and policies of the Countywide Bicycle Plan.

VTA's role varies for each action, and generally falls into three categories:

- In some instances, VTA will **lead** a recommended program or policy. In these cases, VTA will manage the effort and may dedicate staff time or financial resources to the effort.
- For some implementing actions, VTA will provide **funding** to Member Agencies.
- For other actions, VTA will **support** the efforts of Member Agencies and other entities through promoting events, encouraging best practices or providing technical guidance.



These roles are not exclusive. VTA may simultaneously fund, manage, and support different elements of a program or policy.

Goal 1. Develop a Comprehensive Countywide Bicycle Network

Policy 1A: Expand the Network

VTA will support construction of CCBCs and ABCs throughout the county, both as stand-alone projects and as part of related transportation projects.

- **Action 1A-1, Support Implementation of CCBCs and ABCs:** Prioritize and support implementation of CCBCs and ABCs. Lead development of selected high-priority CCBCs and ABCs and partner with County Parks and Recreation Department on relevant improvements. (Lead/Fund/Support)
- **Action 1A-2, Partner with Adjacent Counties:** Work with adjacent counties to develop seamless connections to CCBCs and continue regional coordination through participation in the Caltrans District 4 Bicycle Advisory Committee and the Metropolitan Transportation Commission Active Transportation Working Group. (Lead/Fund/Support)
- **Action 1A-3, Coordinate Across Departments to Review Transportation Projects led by VTA:** Include VTA Bicycle and Pedestrian program staff in design decisions for transportation-related capital projects led by VTA, particularly projects that could impact Cross County Bicycle Corridors or Across Barrier Connections. (Lead)

- **Action 1A-4, Provide Technical Assistance:** Within staff capacity, and as requested by Member Agencies, provide technical and design assistance on transportation projects. Encourage Member Agencies to involve VTA Bicycle and Pedestrian Program staff in transportation projects that affect Cross County Bicycle Corridors, Across Barrier Connections, or bicycle connections to transit. (Support)
- **Action 1A-5: Promote Cross-Jurisdictional Coordination of Bicycle Infrastructure:** Encourage coordination and collaboration between the various Departments of Transportation of the Member Agencies to help ensure that bicycle facilities in one city do not end at that city's boundary, but connect seamlessly with an equivalent facility in the neighboring city.

Policy 1B: Leverage Development to Build Bicycle Infrastructure

VTA will work with Member Agencies to ensure existing and new development supports bicycling.

- **Action 1B-1, Promote Development Standards:** Encourage Member Agencies to endorse and implement the concepts, principles, practices and actions outlined in VTA's Community Design and Transportation (CDT) Manual of Best Practices for Integrating Transportation and Land Use. (Support)
- **Action 1B-2, Review Proposed Developments:** Provide comments on proposed developments through VTA's Development Review process. Comments will support VTA's technical guidelines, design manuals,



and planning documents, including the Countywide Bicycle Plan. (Lead)

- **Action 1B-3, Provide Technical Assistance:** Within staff capacity, and as requested by Member Agencies, provide technical and design assistance on proposed developments. (Support)
- **Action 1B-4, Support Transportation Demand Management:** Within staff capacity, and as requested by Member Agencies, suggest Transportation Demand Management (TDM) programs for new and existing developments. (Support)

Policy 1C: Seek Adequate Funding

VTA will work with Member Agency, regional, state, and federal agencies to identify and secure funding for bicycling projects and programs within Santa Clara County.

- **Action 1C-1, Pursue Funding:** Pursue federal, state and regional funding for selected priority projects within the Countywide Bicycle Plan. (Lead)
- **Action 1C-2, Advocate:** Advocate for bicycle and pedestrian funding at the federal, state, regional, and county levels. (Lead)
- **Action 1C-3, Inform Member Agencies:** Regularly inform Member Agency staff of new and changed funding programs. (Lead)
- **Action 1C-4, Prioritize Funding for Projects in the Countywide Bicycle Plan:** Structure funding sources administered by VTA to prioritize projects and programs in the Countywide Bicycle Plan. (Lead)

Goal 2. Ensure that Bicycling is Safe and Convenient for All

Policy 2A: Improve Quality of Bicycle Infrastructure:

VTA will support a bicycle network that accommodates all cyclists and incorporates advancements in bicycle infrastructure.

- **Action 2A-1, Consider All Riders:** Ensure investments provide bicycle opportunities to all residents, either through designation of low-stress networks or construction of bicycle infrastructure. (Support)
- **Action 2A-2, Conduct Data-Driven Planning:** Support data-driven planning, including data collection, analysis and dissemination efforts related to level of service, facility use, collisions and route choices. Support bicycle transportation research and metrics. (Lead/Fund/Support)
- **Action 2A-3, Uphold Complete Streets Guidelines:** Ensure that VTA and Member Agencies use the MTC Checklist for Routine Accommodation and/or VTA's Complete Streets checklist for projects funded through MTC funding or 2016 Measure B, respectively. (Lead/Support)
- **Action 2A-4, Maintain Access During Construction:** Use best practices for bicycle access/detours during construction projects led by VTA. Educate Member Agencies about best practices for providing bicycle detours around construction sites. (Lead/Support)



- **Action 2A-5: Establish Bicycle-Supportive Metrics and Standards:** Work with Member Agencies to evaluate completion of the bicycle network and the accessibility, safety, health and economic benefits associated with new bicycle infrastructure.

Policy 2B: Ensure Network is Easy to Find and Use

VTA will work to ensure it is easy to navigate by bicycle, along CCBCs using uniform wayfinding tools such as signs, on-street markings, kiosks, maps, apps, in the locally-spoken languages.

- **Action 2B-1, Develop Consistent Wayfinding Signage:** Develop design guidelines and best practices for countywide bicycle wayfinding tools. Encourage Member Agencies to use these wayfinding tools on CCBC facilities within their jurisdiction. Provide information in five most common languages in Santa Clara County (English, Spanish, Chinese, Tagalog, and Vietnamese). (Lead/Fund/Support)
- **Action 2B-2, Update and Distribute Countywide Bicycle Maps:** Continue to update the VTA Countywide Bicycle Map on a regular basis. Continue distributing the map in print and online. Seek opportunities for improved online access to the map. Provide information in five most common languages in Santa Clara County. (Lead)
- **Action 2B-3, Share Bicycle Map Data:** Share VTA base maps and back-of-map information with Member Agencies. Support the development and update of city and sub-regional

bicycle maps for both utility and recreational bicyclists. (Support)

- **Action 2B-4:** Continue to improve VTA's online trip planning tools to provide useful, accurate directions for bicycling and bicycling to transit.(Lead)

Policy 2C: Support Bicyclist Safety and Traffic Laws

VTA will encourage Member Agencies to enforce equitably traffic laws related to bicyclist safety and to improve driver education.

- **Action 2C-1, Encourage Enforcement Programs that Support Bicycle Safety:** Work with the Traffic Safe Communities Network to encourage local law enforcement to incorporate programs effective in reducing bicycle injuries and fatalities. Where there are positive relationships between law enforcement and local community, increased enforcement of traffic laws can improve bicyclist and pedestrian safety. (Fund/Support)
- **Action 2C-2, Support Traffic School for Motorists:** Support the establishment of a violator's traffic school for motorists that violate bicycle-related laws in the California Vehicle Code (CVC). (Support)
- **Action 2C-3, Support Bicycle Diversion Programs:** Support continuation and expansion of bicycle diversion programs, which permit bicyclists to attend traffic school in lieu of paying a traffic fine. (Support)
- **Action 2C-4, Support Legislation:** Support state legislation that improves safety for bicyclists. (Lead)



- **Action 2C-5: Develop a Countywide Vision Zero Plan:** Establish a policy that one traffic death or severe injury is one too many. Using local data, identify primary causes of injury and death for bicyclists and pedestrians. Develop evidence-based countermeasures to change behavior, reduce the risk, and improve safety. (Lead, Fund)

Policy 2D: Promote Bicycle Education

VTA will promote bicycle education programs for all age groups and in all languages in common use in the County.

- **Action 2D-1, Support Bicycle Education in Schools:** Encourage bicycle education for students at multiple points in their school careers. (Fund/Support)
- **Action 2D-2, Support Bicycle Safety Instructors:** Support the development of a pool of certified bicycle instructors to deliver bicycle safety programs to schools and the larger community. (Lead/Fund/Support)
- **Action 2D-3, Develop a Countywide Bicycle and Pedestrian Education/Encouragement Program** In conjunction with the County Public Health Department, develop and implement a countywide program to support safety education and encouragement programs for walking and biking. Program to be funded through 2016 Measure B and meet that funding program's guidelines. Program should be multi-lingual, culturally sensitive, and include outreach to underserved communities and groups most at risk for pedestrian/bicycle injuries and fatalities. (Lead/Fund/Support)

Policy 2E: Encourage Bicycling

VTA will work with local stakeholders to encourage bicycling within Santa Clara County.

- **Action 2E-1, Support Commuter Benefits:** Continue to support bicycle commuter benefits and incentives at the county, state and federal level. (Lead)
- **Action 2E-2, Support Safe Routes to School:** Continue to support Member Agency Safe Routes to School programs, and coordinate communication between service providers. (Lead/Fund/Support)
- **Action 2E-3, Encourage Bicycling Among VTA Staff:** Encourage VTA staff to bicycle to work, and for transit shifts, through a variety of mechanisms. These may include construction of high-quality employee bicycle parking and end-of-trip facilities, contests, education, and bike buddy/bike pool programs. (Lead)
- **Action 2E-4, Encourage Bicycle Parking:** Work with Member Agencies to construct bicycle parking in areas with high levels of bicycle activity, including parks, schools, and dense residential or commercial centers. (Lead/Fund/Support)
 - **Action 2E-5, Support Bicycle Events:** Continue to work with community groups to support bicycle encouragement programs, such as Bike to Work Day, Bike to Shop Day, and Silicon Valley Bikes! Festival and Bike Show. Work with Member Agencies and other entities to support open streets events such as Viva CalleSJ. (Fund/Support)



Goal 3. Pursue Innovative Solutions

Policy 3A: Implement Best Practices in Design

VTA will work with Member Agencies to ensure that bicycle facility designs meet local, state, and national best practices.

- **Action 3A-1, Update and Share Countywide Design Guidelines:** Update the Bicycle Technical Guidelines, Pedestrian Technical Guidelines, Community Design and Transportation Manual, and Transportation Impact Analysis Guidelines as needed. Encourage Member Agencies to implement concepts and principles outlined in these documents. (Lead/Support)
- **Action 3A-2, Research and Share Innovative Design Guidelines:** Encourage the use of evolving best practice design guidelines such as National Association of City Transportation Officials' Urban Bikeway Design Guide, Institute of Transportation Engineers' Recommended Guidelines for Bicycle and Pedestrian Accommodation at Freeway Ramps, and Caltrans' Flexibility in Design memorandum. Periodically evaluate bicycle and pedestrian quality of service measures as advancements are made in the field. Consider new ways to disseminate best practices, such as via the VTA website or quarterly emails to Member Agencies. (Lead/Support)
- **Action 3A-3, Support Safe Roadway Designs:** Support roadway design speeds equal to the posted speed, encourage reducing the width of vehicular travel lanes to discourage

speeding, encourage design of right turns onto and off of freeway ramps to slow speeds, i.e. 10 to 20 mph, and promote traffic calming to reduce speeds and thereby improve bicyclist safety. (Support)

- **Action 3A-4, Implement Design Training Programs:** Continue design training programs for Member Agencies and VTA staff and make the training materials available to them, so Member Agency and VTA staff can use them as a guide for their projects. (Lead/Support)
- **Action 3A-5, Seek Input from People who Bicycle:** Facilitate review of VTA-led transportation projects by VTA Bicycle and Pedestrian Advisory Committee and the general public at appropriate point(s), including early in the project design phase. Encourage Member Agencies to seek input from their BPACs or related bodies and the general public early in the design phase of capital projects. (Lead/Support)
- **Action 3A-6, Identify Best Practices for Signal Operations to Facilitate Bicycling:** Research and share best practices for bicycle detection and optimizing traffic signals along CCBCs to provide quick, convenient flow for people on bikes. (Lead/Support)
- **Action 3A-7, Support Environmental Improvements along Bike Routes:** Look for opportunities to integrate wildlife corridors and other environmental improvements along bicycle paths. (Support)



Policy 3B: Support Ongoing Maintenance

VTA will support Member Agency maintenance programs to ensure existing and constructed bicycle facilities remain safe and navigable.

- **Action 3B-1, Develop Public Feedback Mechanism for VTA Properties:** Provide mechanisms, such as an online reporting form, for members of the public to report maintenance, usability, safety, and security issues with bicycle facilities at VTA properties. Ensure that the contact information is easy to find at the location and on the VTA website. (Lead)
- **Action 3B-2, Identify Gaps and Deficiencies in the Countywide Bicycle Network and Seek Remedies:** Over several years, conduct a field survey of CCBCs and ABCs to identify gaps in the network, as well as deficiencies and obstacles such as potholes, shrubbery encroachment, debris on the bikeway, or poor condition of bikeway signing, striping other markings, or inadequate signal detection. Work with Member Agencies to address any issues. (Lead)
- **Action 3B-3, Explore Opportunities for Centralizing Trail Maintenance Requests:** Explore the feasibility and mechanisms for a single countywide contact to whom trail users could report garbage or trail maintenance issues, whereupon the entity responsible for addressing issue would receive a notice. (Lead, Fund, Support)
- **Action 3B-4, Define and Share Maintenance Best Practices:** Research best practices for

maintenance of on-street and off-street bikeways, current Member Agency maintenance, practices and obstacles to meeting best practices. Collaborate with Santa Clara Valley Water District to develop best practice maintenance and closure for bicycle paths within riparian corridors. (Lead/Support)

- **Action 3B-5, Define and Share Best Practices for Responding to Emergency Trail Closures:** Work collaboratively with Member Agencies and the Santa Clara Valley Water District to define best practices related to emergency trail closures, detours, and reopening. Share information and support agency efforts to meet best practices. (Lead/Support)

Policy 3C: Plan for the Future of Bicycling

VTA will keep abreast of, plan for, and embrace the latest developments in transportation technology, including e-bikes, automated vehicles, big data, and the internet of things.

- **Action 3C-1, Integrate Bicycling into Countywide Travel Model:** Continue to improve the VTA travel model's ability to model bicycle trips. (Lead)
- **Action 3C-2, Collect and Publish Bicycle Count Data:** Continue to collect bicycle counts as part of the Congestion Monitoring Program and as standard practice in collecting traffic counts for capital projects led by VTA. Consider expanding the countywide bicycle count program. Consider establishing a centralized database of bicycle counts for Santa Clara County. (Lead/Support)



- **Action 3C-3: Support Bike Share:** Continue to support Member Agencies' efforts to attract bike share programs appropriate for a suburban environment. Evaluate the effectiveness of new bike share technologies such as dockless bike share and e-bikes. (Support)
- **Action 3C-4: Plan for the Electric Bicycle Revolution:** Follow advancements in the field of electric bicycles, and update travel models, plans, design guides, and operational procedures as appropriate to support electric bicycles. (Lead/Support)
- **Action 3C-5: Leverage New Technologies to Improve Bicycling:** Explore ways that new technologies can improve bicycling, including, but not limited to: real-time information related to the availability of bike racks on buses or bike lockers at stations; 24-hour bicycle/pedestrian count devices; electronic wayfinding tools; bicycle/pedestrian detection systems on transit vehicles. (Lead/Support)
- **Action 3C-6: Integrate Active Transportation into Emerging Automated Vehicle, Connected Vehicle, Smart Infrastructure Technologies:** Ensure that VTA studies, plans, and projects related to connected vehicles, automatic vehicles, and smart infrastructure are used to improve safety, comfort, and convenience for people who bike and walk. (Lead/Support)
- **Action 3C-7, Bring a System of Bicycle Superhighways to the County:** Work with Member Agencies and other stakeholders to identify, design, and build a system of bicycle superhighway corridors, which can

provide unbroken, non-stop, long-distance bicycle travel, physically separated from motorists. (Lead/Fund/Support)

Goal 4. Improve Transit Connectivity

Policy 4A: Improve Bicycle Access to Transit

VTA will link bicycle and transit routes by funding and constructing transit-connected bikeways.

- **Action 4A-1, Support Bicycle Infrastructure Near Transit Stations:** Work with Member Agencies to evaluate and improve bicycle infrastructure and wayfinding that serves major transit stops in Santa Clara County. (Lead/Fund/Support)
- **Action 4A-2, Develop Multimodal Trip Planner:** Continue development of VTA's multimodal trip planner, including integration of bicycle-specific information and tools. (Lead)

Policy 4B: Provide Consistent Bicycle Parking at Transit Stations

VTA will work with local transit agencies to ensure the presence of sufficient secure bicycle parking at transit stops throughout the county.

- **Policy 4B-1, Meet Parking Demand at Transit Stations:** Continue to provide and maintain bicycle parking at major VTA transit stops. Monitor use of VTA-provided bike lockers and bike storage rooms and proactively adjust capacity. (Lead/Fund)



- **Policy 4B-2, Coordinate Bicycle Parking at Transit Stops:** Collaborate with other agencies to provide a uniform and high-quality bicycle parking experience at transit stops in Santa Clara County. Seek ways to improve information related to bicycle parking at transit, including better on-site signage, remote locker availability information, and improved customer support experience. (Lead/Support)
- **Policy 4B-3, Maximize Locker Space Utilization:** Evaluate the use of bicycle lockers, and consider replacing subscription-only single user keyed lockers with first-come first-serve electronic lockers. (Lead)

Policy 4C: Support Safe and Convenient Bicycle/Transit Interactions

VTA will work with its operators and Member Agencies to support seamless interactions between bicyclists and transit vehicles.

- **Action 4C-1, Support Bicycles On-Board Transit:** Continue to expand and improve opportunities for accommodating bicycles on-board transit vehicles, especially as new vehicle types come on line. Improvements include easier to use bicycle racks on light rail vehicles, and three-position bike racks on buses. (Lead)
- **Action 4C-2, Support Safe Bicycle/Bus Interactions:** Promote safe interaction between bicyclists and bus operators by researching best practices for bus/bicycle interactions, encouraging Member Agencies to implement consistent designs at bicycle/transit conflict locations, and continuing to train bus

operators in safe driving around bicyclists. (Lead/Support)

- **Action 4C-3, Monitor Bicycle Use on VTA Transit:** Develop and implement a program to monitor bicycle use on VTA Light Rail and bus vehicles, including denied boardings. Use this information to prioritize improvements. (Lead)

Monitoring Plan Progress

The Countywide Bicycle Plan envisions Santa Clara County as a place where bicycling is safe and convenient, with a bike network that is built using innovative approaches and is connected to transit and other important destinations. To realize this vision, the projects and programs identified in this plan should be implemented between now and 2030. The metrics shown in **Table 8-4** can help VTA track the progress made in building out the CCBC network, constructing ABCs, and providing education and encouragement programs.



Table 8-4: Metrics to Measure Progress in Meeting Plan Goals

Metric	Baseline (if available)
Goal 1: Develop a comprehensive countywide bicycle network	
80% of CCBC network mileage built to LTS 1 or LTS 2 by 2030	48% built LTS unknown
10 new bicycle bridges or undercrossings completed by 2030	0
10 new freeway interchanges improved for bicyclists by 2030	0
Goal 2. Ensure that bicycling is safe and convenient for all	
10% of all trips, school trips, and commute trips made by bicycle by 2030	2% commute by bike
Countywide average daily vehicle miles traveled (VMT) per capita reduced by 15% from 2014 by 2030	TBD
Zero annual bicycle fatalities in Santa Clara County by 2030	6
Wayfinding signage installed on 100% percent of constructed CCBCs by 2030	n/a
20% increase in the percentage of residents and employment accessible via low-stress bicycle networks by 2030	n/a
Goal 3: Pursue innovative solutions to guide future improvements	
A CCBC design manual is developed	None to date
Bicycle counts continue to increase, as measured by CMP Monitoring Report biennial counts	4,000 during peak commute hour in 2016
Goal 4: Improve transit connectivity	
On average, 80% of the three-mile radius around major transit stops served by LTS 2 or better bikeways by 2030	n/a
The percentage of VTA transit customers who bike to transit doubles by 2030	4.5% light rail 3% bus
50% percent increase in number of bicycles that can be accommodated on VTA buses by 2030	100% of fleet has 2-position racks 2 interior parking spaces on 522
90% occupancy (on average) of secure bicycle parking spaces at transit stations by 2030	n/a
100% of secure bicycle parking spaces at transit stations are first-come-first-served electronic lockers or bike rooms by 2030	32% electronic lockers

Conclusion

Santa Clara County is changing. If we maintain the status quo when everything is changing around us—more jobs, more housing, more development—we will see more of the same: gridlock, obesity, poor air quality. In the face of this change, we need to think creatively about ways to get around.

The Countywide Bicycle Plan lays out a vision for the future. One where people of all ages are able to bike safely, comfortably, conveniently to anywhere they want to go. It is VTA's hope that the county's bikeways become part of people's mental map of Santa Clara

County. They will provide an efficient, safe way for people to bike to work, transit, and shopping. They will become a community asset, facilitating friendly, casual interactions with neighbors, co-workers, and strangers. Friends and co-workers will make plans to meet on bike. More people will find that bicycling is competitive with driving. Everyone will have the opportunity to bike at least occasionally, and many people will be able to bike often.

In collaboration with Member Agencies and other stakeholders, and with the leadership of VTA's General Manager and Board of Directors, we can realize this vision.



Students at Meyerholz Elementary School in San Jose learn about bicycle safety. Photo: City of San Jose Safe Routes to School Program



Acronyms and Glossary

Acronyms

ABC	Across Barrier Connection
ATP	Caltrans Active Transportation Program
CAMP	Campbell
CCBC	Cross County Bicycle Corridor
CU	Cupertino
GIL	Gilroy
GIS	Geographic Information Systems
HSIP	Highway Safety Improvement Program
LA	Los Altos
LAH	Los Altos Hills
LG	Los Gatos
LTS	Level of Traffic Stress
MH	Morgan Hill
MIL	Milpitas
MSO	Monte Sereno
MTC	Metropolitan Transportation Commission
MV	Mountain View
OBAG	One Bay Area Grant
PA	Palo Alto
PCI	Pavement Condition Index
SAR	Saratoga
SC	Santa Clara (City of)
SCC	Santa Clara County
SJ	San Jose
SRTS	Safe Routes to School
SV	Sunnyvale

SWITRS Statewide Integrated Traffic Records System

TDA-3 Transportation Development Act Article 3

TFCA Transportation Fund for Clean Air

UPRR Union Pacific Railroad

VERBS Vehicle Emissions Reductions Based at Schools

VTA Santa Clara Valley Transportation Authority

Glossary

2016 Measure B: A transportation sales tax measure approved by Santa Clara County voters in November 2016. Funds are administered by VTA and support nine program areas, including bicycle and pedestrian projects and education/encouragement programs.

Across Barrier Connection: “Problem spots” where improvements are needed to close gaps in the bicycle network. ABCs are found where the street and path network intersects with freeways, waterways, or railways. The plan identifies three types of ABCs: Category 1: Inadequate Roadway Crossings, Category 2: Unfriendly Freeway Interchanges, Category 3: Large Distance Between Existing Crossings of Major Barriers.

Active Transportation: Walking, bicycling, or taking transit –all transportation modes that require physical exertion of some sort.

Bicycle Boulevard: A low-speed local roadway optimized for bicycle travel. Bicycle boulevards may use traffic calming treatments to slow motorists and prioritize bicyclists.



Bikeway: Generic term for linear bicycle infrastructure. Includes bicycle paths, bicycle lanes, bicycle routes, bicycle boulevards and cycle tracks.

Buffered Bike Lane: A striped bike lane on a road with a painted buffer next to it. The buffer is typically 2 or more feet wide, and marked with diagonal hashing. The buffer is typically placed between the bike lane and adjacent motor vehicle travel lane.

Caltrans Bicycle Classifications: Caltrans' Highway Design Manual classifies bicycle facilities into four classes:

Class I Paths are paved paths with exclusive right of way for bicyclists and pedestrians, away from the roadway and with cross flows by motor traffic minimized.

Class II Bicycle Lanes provide a striped lane for one-way bicycle travel on a roadway.

Class III Bicycle Routes are roadways identified as preferred routes for bicyclists. Bicycle routes do not have special accommodations for bicyclists, other than signs designating the roadway as a bicycle route. Bicyclists may share the travel lane with motorists, or may use the shoulder if one is provided.

Class IV Separated Bikeways, also known as cycle tracks or protected bike lanes, are bicycle lanes that are physically separated from adjacent motor vehicle lanes by a vertical feature. Physical separation may be provided by parked cars, bollards or planters. Alternatively, the entire bikeway may be raised above the level of the adjacent vehicle lanes. These bikeways are for the exclusive use of bicyclists.

Complete Streets: The complete streets concept calls for public roads to be designed and built for the safe mobility of all roadway users. Motorists, transit riders, bicyclists, and pedestrians of all ages and abilities must be able to move safely along and across the transportation network.

Cross County Bicycle Corridors (CCBC): A subset of on-street bikeways and off-street bike paths that provide high-quality, cross-jurisdictional routes. CCBCs connect Santa Clara County communities and adjacent counties and serve major destinations and transit.

Cycle Track: See definition for Class IV Separated Bikeway.

Geographic Information Systems (GIS) Computer software that stores, manipulates, analyzes, and visualizes geographic information on a map.

Level of Traffic Stress (LTS): A measurement of how stressful a road or bikeway is for bicyclists. LTS 1 is the least stressful, suitable for child bicyclists, and includes locations such as bicycle paths. LTS 4 is the most stressful, for example, El Camino Real or County expressways. LTS is calculated using measurable roadway characteristics, such as number of lanes, presence of bicycle lane, speed, and traffic volumes, among other characteristics.

Member Agencies: VTA's Member Agencies consist of the County of Santa Clara and the fifteen cities and towns within Santa Clara County.

Mode Share/Mode Split: The percentage of people who travel in a particular way. For example, if 2 out of 100 people bicycle to work, the bicycle mode share or mode split is 2%.



One Bay Area Grant (OBAG): The primary grant program by which federal transportation funds are distributed to local agencies in the San Francisco Bay Area. The Metropolitan Transportation Commission distributes OBAG funds to county Congestion Management Agencies, including VTA, which are then responsible for soliciting, evaluating, and selecting eligible projects within their jurisdictions.

Pavement Condition Index: A numerical index between 0 and 100 which is used to indicate the general condition of pavement. Higher numbers indicate smoother pavement.

Shared Lane Markings: Pavement markings placed in the travel lane to indicate to motorists that bicyclists may use the full lane. Marking is a bicycle with two chevrons on top.

Trail: A travelway for bicyclists and/or pedestrians that is physically separated from motor vehicle traffic. Trails can be paved or unpaved. This document uses the term bicycle path when referring to paved Class I bikeways.