Solano Transportation Authority

Solano County

ACTIVE TRANSPORTATION PLAN

2020

Acknowledgements

Plan Development Team

City of Benicia - Victor Randall, Suzanne Thorsen
City of Dixon - Joe Leach
City of Fairfield - Corey Beavers, Brian Miller, Garland Wong
City of Rio Vista - Robin Borre
City of Suisun City - Joann Martinez
City of Vacaville - Gwen Owens
City of Vallejo - Sam Kumar, Matthew Gleason
Unincorporated Solano County - Jason Riley
Caltrans - Jake Freedman
Bicycle and Pedestrian Advisory Committee Representatives - Bob Berman, Diane Dooley, Nancy Lund, Neal Iverson

Solano Transportation Authority
Anthony Adams
Brent Rosenwald
STA Bicycle Advisory Committee
STA Pedestrian Advisory Committee
STA Active Transportation Policy Committee

Consultant Team

Toole Design
Patrick Gilster, AICP
Brooke DuBose, AICP
Joel Shaffer
Belinda Judelman
Laura Krull
Sara Rauwolf

DKS Associates
Josh Pilachowski, PhD, P.E.
Mahdi Rouholamin
Dane Rini

Contents

Executive Summary

Purpose

The Solano Countywide Active Transportation Plan provides a framework to help the Solano Transportation Authority (STA) improve active transportation conditions throughout Solano County. The Plan builds upon previous active transportation planning efforts and consolidates STA's separate Countywide Bicycle, Pedestrian, Safe Routes to School, and Safe Routes to Transit Plans into one cohesive Plan. It establishes countywide priorities and provides project lists and program guidance which STA and local jurisdictions can use to help people of all ages and abilities feel comfortable walking and bicycling.

A Shared Vision

The Plan provides a set of seven values for the development of Solano's active transportation network. A set of seven goals, 17 objectives, and 55 actions support the values and will help STA develop a regional active transportation network suitable for people of all ages and abilities. The seven values important to Solano residents include:

- Access
- Equity
- Health and Safety
- Quality of Life
- Environmental Stewardship
- Collaboration
- Investment

Public Involvement

Stakeholder and public engagement were embedded throughout every stage of the Plan development. STA staff and representatives from each of Solano's seven local jurisdictions guided key steps of the process. A Plan Development Team (PDT) served as an advisory committee; it included members from each of the incorporated jurisdictions and representatives from both the STA Bicycle Advisory Committee and Pedestrian Advisory Committee. During each stage of the Plan development, the public provided insights on where walking, biking, and access to transit could be improved and prioritized. The public was engaged through online and in-person outreach efforts in each of the incorporated jurisdictions.

A Network for People of All Ages and Abilities

One of the key purposes of the Plan is to improve walking and bicycling conditions for people of all ages and abilities. This is accomplished through the creation of a network of facilities suitable not just for commuters or recreational cyclists, but one designed to be comfortable for any age or skill level, which is referred to here as the backbone network. The backbone network links major destinations and residential areas to areas of countywide significance, like transit centers, and provides linkages across jurisdiction lines. The network is developed by combining a series of technical analyses with input from local jurisdictions and the public to identify areas which have the highest propensity to produce walking and bicycling trips. Countywide and local backbone networks are combined with an assessment of existing pedestrian and bicycle facilities and local roadway conditions to identify the highest priority locations for comfortable bicycling facilities and sidewalk network improvements.

Recommendations

The PDT identified hundreds of projects to help develop Solano's active transportation network. In total, the plan recommends 308 bikeway projects and 148 pedestrian projects. The bicycle and pedestrian projects form a connected active transportation network, improve access to schools and transit, and develop a regional trail network that enhances the existing regional trails, including the Vine, SF Bay, and Bay Area Ridge Trails. Page vii highlights the different types of projects recommended in the Plan. The pedestrian projects focus on sidewalk gap closure and crossing treatments to improve safety and access to key destinations. The bicycle projects connect people to key destinations and improve connections between jurisdictions.

Solano County Active Transportation Plan Recommendations by the Numbers

23
miles of bikeways recommended to enhance the regional trail network

77%
of recommended bikeways are for All Ages and Abilities

57
miles of bikeways recommended to complete the active transportation backbone network

261
miles of bikeways recommended for Safe Routes to School

176 miles of sidewalk infill & **94** crossing treatments recommended for Safe Routes to School

240
miles of bikeways recommended to improve access to transit

148
pedestrian projects recommended to improve access to transit

178
miles of protected bikeways and off-street trails

This page is intentionally left blank.

CHAPTER 1

Introduction

The Solano Transportation Authority (STA) is working to improve active transportation conditions throughout Solano County so that people of all ages and abilities feel comfortable walking and bicycling. STA is responsible for:

- Countywide transportation planning,
- Transportation program funds,
- Managing and providing transportation programs and services,
- Delivering transportation projects, and
- Setting transportation priorities.

The Solano Active Transportation Plan (Solano ATP) is an effort to consolidate STA's separate Countywide Bicycle, Pedestrian, Safe Routes to School, and Safe Routes to Transit Plans into one cohesive Plan which can help encourage more people to walk and bike in Solano County. This plan summarizes existing conditions for people walking and bicycling in Solano and provides a recommended network and specific projects which STA and Solano jurisdictions can use to better support active mobility across the county. The main body of the Solano ATP summarizes existing conditions and recommendations for the unincorporated Solano County connections that knit Solano together; the same information is provided for each of the seven incorporated jurisdictions in *Appendix A: Local Jurisdiction Plans*.

Figure 1: Many People Walk and Bike in Solano County

Solano County Overview

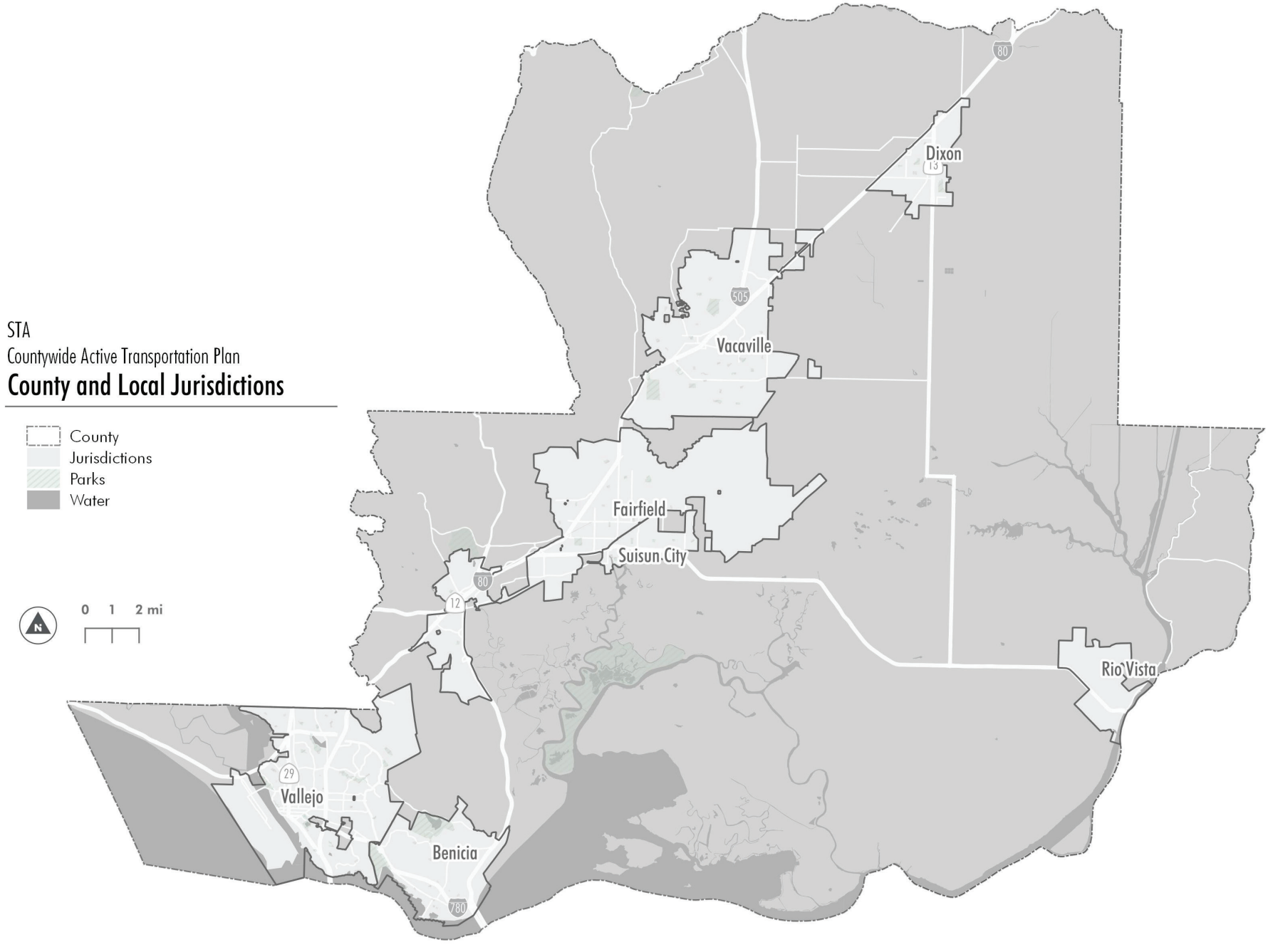
Solano County is located along the northeast portion of the San Francisco Bay in the area commonly referred to as the North Bay. Encompassing a total of 906 square miles, the county is situated along Interstate I-80, just north of the East Bay region and approximately 13 miles southwest of Sacramento. The San Pablo Bay, Carquinez Straight, and various other waterways from the Sacramento and San Joaquin Rivers form Solano County's southern boundary with Contra Costa County. To the west, several ridgelines form the boundary with Napa County while Yolo County and Sacramento form the northern and eastern boundaries. While the county is a part of the San Francisco Bay Area, its eastern portion is generally considered more akin to the Sacramento Valley. Most of the county's population is located within the incorporated cities of Vallejo, Benicia, Fairfield, Suisun City, Vacaville, and Dixon, all along the Interstate 80 (I-80) corridor with 96 percent of the county's population residing in these incorporated cities. Highway 12 runs east/west through the county and connects Fairfield and Suisun City with Rio Vista, which sits on the banks of the Sacramento River.

The United States Census American Community Survey (2017) estimates that Solano County has a population of 445,458 and is one of the fastest growing counties in California. Table 1 provides an overview of population change from 2010 to 2017. While the countywide population increased by nearly eight percent from 2010 to 2017, the share of the population age 16 or older walking, bicycling, or taking transit to work increased by less than five percent during that same time period. The Solano Transportation Authority hopes to use the Solano Active Transportation Plan to improve multimodal connections to transit and encourage more people to walk and bicycle.

Table 1: Solano County Population and Land Area

Jurisdiction	2010 Census Population	ACS 2017 Population	Percent Change	Land Area (Sq. Miles)
City of Benicia	26,997	28,343	5.0%	12.93
City of Dixon	18,351	20,202	10.1%	7.13
City of Fairfield	108,321	116,266	7.3%	40.92
City of Rio Vista	7,360	9,009	22.4%	6.64
City of Suisun City	28,111	29,639	5.4%	4.11
City of Vacaville	92,428	100,032	8.2%	28.81
City of Vallejo	115,942	122,105	5.3%	30.67
Unincorporated	15,834	19,862	25.4%	691
Countywide Total	**413,344**	**445,458**	**7.8%**	**822** (**906** with Federal Lands)

Figure 2: Solano County and Local Jurisdictions



Plan Purpose

The purpose of the Solano Countywide Active Transportation Plan is to document existing conditions and provide a shared vision for the development of a well-connected active transportation network for pedestrian and bicycle facilities that is comfortable for people of all ages and abilities. The plan provides a detailed project list for each jurisdiction as well as the unincorporated areas of Solano so that all communities in the region can work together to improve access to active transportation opportunities within and between communities.

This Plan equips STA and each incorporated jurisdiction with:

- Bicycle network recommendations,
- Pedestrian network recommendations,
- Policy and funding recommendations,
- A high-level traffic safety analysis, and
- Design guidance.

Each element of this Plan can help STA and Solano's seven incorporated jurisdictions make walking and bicycling safer, more comfortable, and more convenient for its residents. The Solano Countywide Active Transportation Plan provides a clear path toward achieving this vision for all communities in the region. It should be noted that each of the incorporated jurisdictions can adopt their sections of the Plan as they see fit and identified recommendations are subject to change based on those individual processes. This Plan is designed to provide local jurisdictions with best practice technical analysis and project recommendations. However, as STA does not have implementation authority, each jurisdiction is responsible for further analysis and potential implementation of any identified recommendation.

Serving People of All Ages and Abilities

Many factors contribute to a person's willingness to walk or ride a bicycle, with a major factor being a person's perception of safety and comfort. A bicyclist or pedestrian's perception of an unsafe route can be related to numerous environmental and social characteristics, but it is often related to riding or walking adjacent to high-traffic and high-speed roadways or crossing busy intersections with little or no separation from vehicles. Research has found that a large share of the American population is interested in bicycling for transportation, but does not currently do so because they believe the routes they would need to travel on are unsafe or feel uncomfortable. Many people feel safer and more comfortable riding on low-traffic, low-speed streets or on facilities that provide protection or physical separation from fast-moving traffic.[1]

When considering how to develop a network for people of all ages and abilities, it is useful to think about the different types of bicyclists present in a community. On one end of the bicyclist spectrum are people who feel comfortable riding with traffic in almost any condition. These types of riders are considered "highly confident" bicyclists (e.g., adults who regularly commute by bicycle) and are willing to ride on roads with little or no dedicated bicycle infrastructure. On the opposite end of the spectrum is the "non-bicycle" population, who will not ride a bicycle at all or may have physical limitations that prevent them from being able to ride a bicycle. The largest segment of the population is generally willing to ride a bicycle, but does not feel comfortable sharing the lane with motor vehicles or riding adjacent to high-speed and high-volume traffic (e.g., children, the elderly, and non-regular adult bicyclists). These types of riders are known as the "interested but concerned," and they prefer off-street bicycle facilities or bicycling on low-speed, low-volume streets; they may not bike at all if bicycle facilities do not meet their comfort preferences. The middle of the spectrum includes bicyclists who prefer separated facilities but are willing to ride with or adjacent to traffic if needed. Most people in the U.S. – between 50 and 60 percent – have little tolerance for interacting with motor vehicle traffic unless volumes

1 Dill, J. McNeil, N. "Revisiting the Four Types of Cyclists: Findings from a National Survey" Transportation Research Board 95th Annual Meeting, 2016

Figure 3: Comfort Typology of Bicyclists

Comfort Typology of Bicyclists

Design User Profile	Non-Bicyclist	Interested but Concerned	Somewhat Confident	Highly Confident
Bicycling Preferences	Uncomfortable bicycling in any condition, have no interest in bicycling, or are physically unable to bicycle.	Often not comfortable with bike lanes, may bike on sidewalks even if bike lanes are provided; prefer off-street or separate bicycle facilities or quiet or traffic-calmed residential roads. May not bike at all if bicycle facilities do not meet needs for perceived comfort.	Generally prefer more separated facilities, but are comfortable riding in bicycle lanes or on paved shoulders if need be.	Comfortable riding with traffic, will use roads without bike lanes.
Percent of General Public	31-37%	51-56%	5-9%	4-7%

and speeds are very low (Figure 3).[2] This group of riders is referred to as "interested but concerned," reflecting both their interest in bicycling for transportation as well as concerns about safety and comfort when interacting with motor vehicle traffic.

This framework of rider types was used to assess the existing bicycle network and to select recommended facility types for the Solano ATP. This rider type has the highest potential for increasing bicycle mode share if facility types that support and encourage bicycling for this type of rider are available. By developing a network geared towards the preferences of the majority of bicyclists, including those who are most sensitive to safety concerns, Solano can provide a bicycle network that is likely to be comfortable for people of all ages and abilities.

While a pedestrians' decision to walk may be influenced by somewhat different factors than a bicyclist's, the same general principles are true for pedestrian safety and comfort. Pedestrians are vulnerable to serious injuries and fatalities when struck by vehicles traveling at speeds 30 mph or faster.[3] Children and older adults are especially vulnerable to severe injuries and fatalities when struck by a vehicle.[4] As such, pedestrian facility designs that physically separate pedestrians from vehicles, whether along streets or at crossings, are important aspects of safe pedestrian network design and building an all ages and abilities network. This understanding served as the basis for the pedestrian network analysis and the selection of recommended pedestrian projects for the Plan.

2 Studies, such as the one referenced above, show that approximately one third of the adult population is not currently interested in bicycling or able to bicycle.

3 Tefft, B.C., "Impact Speed and a Pedestrian's Risk of Severe Injury or Death," Accident Analysis & Prevention, Vol. 50, 2013, pp. 71-878.

4 Tefft, B.C., "Impact Speed and a Pedestrian's Risk of Severe Injury or Death," Accident Analysis & Prevention, Vol. 50, 2013, pp. 71-878.

The Planning Process

The Plan was developed over the course of 18 months during 2018 and 2019. The process was guided by Solano County Transportation Authority (STA) staff and representatives from each of the seven local jurisdictions. Their input was sought on key elements, such as existing conditions, bicycle network development and recommendations, pedestrian project identification, and the project prioritization process. The Plan was developed in four distinct phases of analysis and public engagement. A Plan Development Team (PDT) was formed as an advisory committee which included members from each of the incorporated jurisdictions and representatives from both the STA Bicycle Advisory Committee and Pedestrian Advisory Committee. The PDT met seven times over the course of the Plan development process.

Phase 1: Data Collection and Initial Outreach (Fall 2018)

- **Two PDT Meetings, Phase 1 Community Events in each Jurisdiction, Online WikiMap, and Website**
- **Data Collection, Resources, Goals, and Existing Conditions**

Phase 2: Countywide Needs and Recommendations (Winter 2019)

- **Two PDT Meetings, Advisory Committee Meetings, and Website Updates**
- **Summary of Phase 1 Engagement and Countywide Network and Needs Analysis**

Phase 3: Jurisdictional Needs and Recommendations (Spring/Summer 2019)

- **Two PDT Meetings, Jurisdiction Staff Charrettes and Walking Audits, and Website Updates**
- **Jurisdiction Networks and Needs Analysis, Project Lists, and Draft Countywide Network ATP Chapter**

Phase 4: Implementation Strategy and Draft Plan (Fall 2019/Winter 2020)

- **Community Events in each Jurisdiction, One PDT Meeting, and Board Review**
- **Project Prioritization, Implementation Strategy, and Draft and Final Countywide Active Transportation Plan**

Public Engagement Embedded throughout the Process

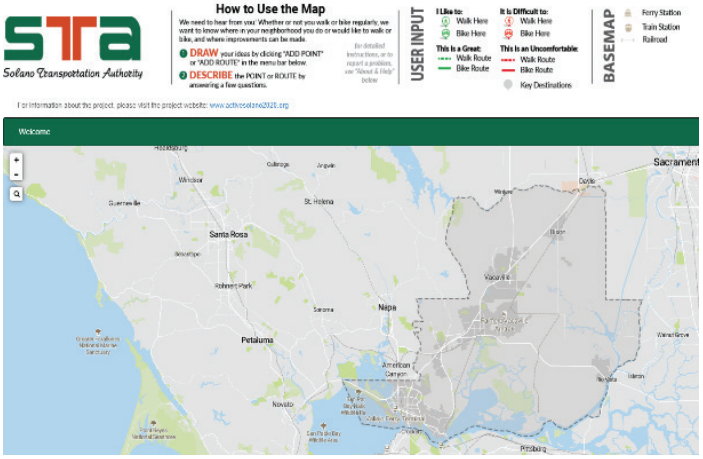
During each stage of the Plan development, the public was asked to provide insights across the County on where improvements to walking, biking, and access to transit could be made and prioritized. Public engagement occurred in each of the incorporated jurisdictions and were complimented by online activities to allow those that could not attend events to provide their input. A summary of the public engagement efforts for each phase are summarized below, for more details on the public engagement see *Appendix A: Local Jurisdiction Plans* which summarizes the public input from each jurisdiction.

Phase 1: Data Collection and Initial Outreach

The goal of Phase 1 was to spread the word about the project using a variety of online platforms and host a pop-up input event in each of the seven incorporated jurisdictions. Phase I focused on listening to where Solano County residents, businesses, and visitors experience barriers to walking and bicycling and identifying locations that should be evaluated for potential project recommendations. The largest public involvement occurred during this initial stage.

Figure 4: Plan Website

Figure 5: Online Interactive WikiMap



Project Website

The project website was a place for the public to learn about the project, stay up-to-date on the planning process, and find out about local outreach events. The website included a link to the interactive map in multiple languages. The website was hosted by STA and was open during the entire duration of the project. The website content was updated during each major project phase.

Online Interactive WikiMap

The WikiMap is an online, interactive map that gives members of the public a chance to identify locations where they feel comfortable or uncomfortable walking and bicycling throughout Solano. WikiMap input was used to better understand existing conditions and to identify key destinations for the priority network analysis. The WikiMap was hosted on the project website and was promoted on social media by each jurisdiction. The WikiMap was available for public comment for approximately three months.

Figure 6: Social Media Blast on Facebook for a Plan event in Vallejo

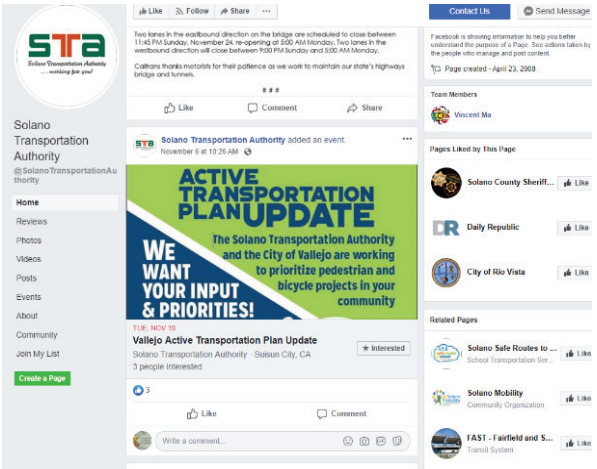


Figure 7: Pop-up Input Station at Fairfield Candypalooza

Social Media Blasts

Social media blasts were developed for each stage of the project to promote attendance at events. A list of active social media accounts on Facebook and Twitter was developed to promote the spread of information by additional governmental agencies, community-based organizations, and other related groups or businesses.

Pop-up Input Stations

The consultant team hosted pop-up input stations at local events in each jurisdiction (see list below). These input stations provided an opportunity for community members to learn about the Plan, speak directly with Plan Development Team staff, and draw on maps to show where they like and don't like to walk and bike. The input stations also included a destination prioritization activity where community members could vote on the types of destinations they want to see prioritized in the Plan. Similar to the WikiMap comments, the feedback from the pop-up input stations was integrated into the priority network analysis.

- Benicia: Farmers Market
- Dixon: Tree Lighting
- Fairfield: Candypalooza
- Rio Vista: Bass Derby Festival
- Suisun City: Wine and Chocolate Festival
- Vacaville: Tree Lighting
- Vallejo: Farmers Market

Phase 2: Countywide Needs and Recommendations

The goal of Phase 2 was to develop the priority countywide backbone network projects which would create a countywide all ages and abilities network. This phase consisted primarily of technical analysis conducted by the consultant team and review of major deliverables by the PDT. The outcomes of this phase include a regional priority bikeway network, regional priority pedestrian project recommendations, and regional trails network. STA will use these project recommendations to promote regional connectivity and to work with local jurisdictions to identify future funding opportunities to get projects on the ground.

Figure 8: Joint Bicycle and Pedestrian Advisory Committee and PAC Meeting

Plan Development Team Meetings

The Plan Development Team (PDT) included staff from STA, the consultant team, and each of the incorporated jurisdictions. The PDT's role was to review and provide input on key processes and analyses. In Phase 2, the PDT reviewed the existing conditions report and technical analyses for the attractors/generators analysis. The attractors/generators analysis was a process that identified the routes with the highest potential for producing bicycling and walking trips. Each jurisdiction representative weighed public input on the types of destinations that attract trips (e.g., schools, shopping, transit, parks, etc.) and the areas that produce trips (e.g., multi-family housing, communities of concern, zero-car households, etc.) to identify the most important connectivity considerations for their jurisdiction. A separate countywide attractors/generators analysis was conducted to show regional priority connections that focused on linking major transit areas.

Phase 3: Jurisdiction Needs and Recommendations

The goal of Phase 3 was to work with each local jurisdiction to create an all ages and abilities bikeway network and supportive gap closure and connectivity recommendations. Each jurisdiction was presented with initial all ages and abilities recommendations that included the identification of trade-off implications such as potential travel lane reallocation needs and parking removal.

Figure 9: Walk Audit in Benicia

Walking Tours and Jurisdiction Staff Working Meetings

Jurisdiction staff reviewed and commented on the bicycle network and pedestrian project lists with the associated trade-offs to help ground-truth potential implementation considerations. STA and the consultant team then met with each jurisdiction to review recommendations and discuss trade-offs with jurisdiction staff. Each list was then revised as needed in collaboration with jurisdiction staff to make sure recommendations could be supported at the local level. Many project recommendations may need traffic or parking studies, community engagement, or Complete Streets studies prior to implementation. Each jurisdiction working meeting included a walking tour of many of the recommendations to discuss implementation considerations.

Phase 4: Implementation Strategy and Draft Plan

The goal of Phase 4 was to present the jurisdiction approved project recommendations back to each of the seven incorporated jurisdictions. To help with an implementation strategy, each jurisdiction was able to select the appropriate event type that they felt would give them the best chance for coordinating and getting projects on the ground.

Figure 10: Transportation Advisory Commission meeting in Dixon.

Local Jurisdiction Workshop Meeting or Advisory Meeting

Each jurisdiction recommended the forum they wanted to use for the final public engagement activity that centered around reviewing the project lists and identifying which projects should be prioritized. Using an activity called "5 in 5", participants at each event were asked to identify the top 5 bicycle corridor recommendations that should be prioritized to build out a citywide, connected network. Given limited funding availability, the top five corridors were used in conjunction with the data-driven prioritization to develop a consolidated implementation strategy for each jurisdiction.

- **Benicia:** Traffic, Pedestrian, and Bicycle Safety Committee Meeting
- **Dixon:** Transportation Advisory Commission Meeting
- **Fairfield**: Three E's Advisory Commission Meeting
- **Rio Vista:** Active Transportation Plan Community Meeting
- **Suisun City:** Joint event with the STA Pedestrian Safety Symposium
- **Vacaville:** City Staff Meeting
- **Vallejo:** Active Transportation Plan Community Meeting

Plan Organization

The Solano Active Transportation Plan includes the following elements to help communities implement pedestrian and bicycle projects and create an active transportation network that is comfortable for people of all ages and abilities. Most of the Plan body focuses on elements that STA would lead or has identified as countywide priorities to work with local jurisdictions to find funding for local implementation of projects.

Chapter 2: Goals and Actions

This chapter summarizes the values, goals, objectives, and actions developed for this Plan. These important elements provide a backdrop for the analyses and projects discussed in the remainder of the Plan.

Chapter 3: Countywide Existing Conditions

This chapter summarizes the state of pedestrian and bicycle conditions and safety trends throughout Solano County.

Chapter 4: Backbone Network Priorities

This chapter presents the countywide active transportation backbone network, the countywide priority projects, and discusses important programs which can be used to support the design projects and further enhance the active transportation network.

Chapter 5: Implementation and Funding

This chapter explains the implementation details for the priority projects and presents a summary of funding sources available for active transportation projects at the Federal, State, and Regional level.

Appendices

A: Local Jurisdiction Plans

- Benicia
- Dixon
- Fairfield
- Rio Vista
- Suisun City
- Vacaville
- Vallejo
- Unincorporated Solano County

B: Technical Analysis and Summary Memorandums

- Literature Review
- Existing Conditions Report
- Demand Analysis Memo
- Attractors/Generators Technical Memo
- Network Gap Analysis Memo
- Wayfinding Memo 3
- Safety Analysis Technical Memo
- Funding Sources
- Cost Estimates Methodology

C: Pedestrian and Bicycle Design Treatments Toolkit

D: Detailed Countywide Recommended Active Transportation Project Lists

CHAPTER 2

Goals and Actions

The goals and actions listed below will aid the Solano Transportation Authority in building an active transportation network and implementing programs and policies that help people of all ages and abilities feel comfortable walking and bicycling throughout Solano. These goals are reflective of seven key values which influenced the development of the recommendations in this Plan. The goals were collaboratively created by the Project Development Team and were vetted and adopted by the STA Policy Committee.

Access

Goal 1: People of all ages and abilities should be able to walk and bike throughout Solano using a comfortable, connected, and well-maintained network to access transit and key destinations.

Equity

Goal 2: All Solano County residents should have equitable access to convenient and safe, low-cost transportation options.

Health and Safety

Goal 3: Solano County's transportation system should be designed to increase our community's health and safety by providing opportunities for increased active transportation, increasing roadway safety, and reducing vehicle emissions.

Quality of Life

Goal 4: Solano communities should be vibrant, active, and promote a good quality of life for all residents.

Environmental Stewardship

Goal 5: Solano County's active transportation system will reduce environmental impacts by promoting the reduction of air pollution, vehicle miles traveled, and greenhouse gas emissions.

Collaboration

Goal 6: Solano should work collaboratively with local and regional partners to realize shared active transportation values.

Invest in Our Values

Goal 7: Solano County and its seven cities take pride in investing in active transportation as an aspect of our community by funding mobility options for residents in their everyday lives.

Objectives and Actions

The objectives and actions listed below were developed to provide further clarity on how to implement the Solano Active Transportation Plan and bring the values and goals to life. The objectives and actions were created based on the objectives and actions in the *Solano Countywide Bicycle, Pedestrian*, and *Safe Routes to Transit Plans* so that the efforts presented in this Plan build on those adopted in previous countywide plans.

Table 2: Solano Active Transportation Plan Values, Goals, and Actions

ACCESS **Goal 1. People of all ages and abilities should be able to walk and bike throughout Solano using a comfortable, connected, and well-maintained network to access transit and key destinations.**
Objective 1.A: Continue to work with member agencies to build upon the existing Class I paths and other low-stress networks to complete a Countywide Low-Stress Active Transportation Network.
Action 1.A.1: Support planning and implementing a low-stress and comfortable bikeway and pedestrian network that enables access to transit, key destinations, and recreational opportunities where feasible. Low stress is defined as bicycle facilities that would be comfortable for all users of the system, including older adults, people with disabilities, and youth under 18.
Action 1.A.2: Support and coordinate the planning of pedestrian connections, improvements and pedestrian-oriented development throughout Solano.
Action 1.A.3: Continue to develop detailed and ranked improvements in collaboration with each local Solano jurisdiction based on a variety of objective and subjective criteria chosen by each member agency, including (but not limited to) number of activity centers served, closure of critical gaps, immediate safety hazards, existing and potential bicycle or pedestrian use, support from the public and local jurisdictions, and availability of funding.
Action 1.A.4: Build upon the existing bicycle and pedestrian facilities and programs in Solano County by: » Supporting the implementation of gap closure projects. » Supporting before and after bicycle counts at specific locations and times to measure the relative effectiveness of various investments. » Encouraging that new roadways, transportation projects, roadway improvement projects, and developments improve bicycle travel and system continuity. » Encouraging the use of national best practice design guidelines (such as from NACTO or AASHTO) and the Solano Active Transportation Plan Treatment Toolkit when designing new bicycle and pedestrian facilities. » Supporting the maintenance of the Safe Routes to School (SR2S) plan and funding the enforcement, education, encouragement, and engineering components of the program.
Action 1.A.5: Coordinate with member agencies and Caltrans to implement projects identified in the 2018 Caltrans District 4 Bicycle Plan and future Caltrans District 4 Pedestrian Plan that are within Solano, particularly if it corresponds with the priorities of our member agencies.
Objective 1.B: Maintain existing bicycle and pedestrian facilities and provide funding for maintenance of future facilities.

EQUITY

Goal 2: All Solano residents should have equitable access to convenient and safe, low-cost transportation options.

Objective 2.A: Work to balance the needs of all transportation users and promote investments in underserved Solano communities.

Action 2.A.2: Encourage the maximization of multimodal connections and access to transit for all residents.

Action 2.A.1: Continue to encourage and facilitate opportunities that allow input from bicyclists and pedestrians for all transportation projects, through the STA BAC, PAC, and SR2S process, with a consideration towards Equity (e.g. Communities of Concern or Disadvantaged Communities). Continue to utilize the BAC and PAC to vet countywide policy goals, priorities, and projects.

Action 2.A.3: Coordinate with member agencies to address connectivity barriers for vulnerable populations, such as older adults, people with disabilities, or youth under 18.

Objective 2.B: Provide equitable resources to all local jurisdictions in Solano.

Action 2.B.1: Coordinate with member agencies to balance the implementation of projects across all jurisdictions and communities in Solano, neighboring counties, and partnering agencies.

Action 2.B.2: Continue to encourage and support public input and participation in the planning process through workshops, pop-up events, online resources and other innovative engagement methods to meet people where they are, where feasible.

HEALTH AND SAFETY

Goal 3. Our transportation system should be designed to increase our community's health and safety by providing opportunities for increased active transportation, increasing roadway safety, and reducing vehicle emissions.

Objective 3.A: Recommend safety improvements based on monitoring and data.

Action 3.A.1: Continue to work with member agencies to monitor key safety problems and problem routes and areas, with a focus on vulnerable populations and key connections.

Action 3.A.2: Coordinate with member agencies to monitor and track bicycle- and pedestrian-related collision levels through available data sources, including big data sources as available.

Action 3.A.3: Look for funding opportunities to develop a system for reporting and responding to maintenance problems on the existing bikeway and pedestrian networks, in collaboration with member agencies.

Action 3.A.4: Encourage bicycle and pedestrian safety curriculum to be incorporated into existing motorist education and training.

Action 3.A.5: Encourage the use of lighting and emergency call boxes along Class I bike paths carrying high numbers of commuters as they are eligible for a variety of regional, state, and federal funding sources.

Action 3.A.6: Support and encourage the identification bicycle routes located in agricultural spraying zones and warn bicyclists through signing about the potential hazard and the typical spraying periods.

Objective 3.B: Encourage new development and construction zones to include safety precautions for bicyclists and pedestrians.

Action 3.B.1: Encourage the incorporation of provisions for safe bicycle travel and/or detours in traffic control plans and through construction zones

Objective 3.C: Promote health benefits of active transportation and ensure safety benefits reach all users.

Action 3.C.1: Encourage safety improvements that benefit youth under 18, older adults, and people with disabilities in bicycle and pedestrian projects.

Action 3.C.2: Encourage collaboration with Public Health organizations to promote the health benefits of active transportation.

QUALITY OF LIFE

Goal 4: Solano communities should be vibrant, active, and promote a good quality of life for all residents.

Objective 4.A: Link active transportation facilities to trails and recreational amenities.
Action 4.A.1: Collaborate with agencies who manage open space and other recreational areas to provide access to outdoor opportunities for all Solano residents.
Action 4.A.2: Support the completion of regional trails that link destinations within Solano and beyond, including the San Francisco Bay Trail,the Bay Area Ridge Trail, and the Napa Valley Vine Trail.
Action 4.A.3: Encourage the inclusion of amenities such as water fountains, long-term and short-term bicycle parking, shade structures, public art, rest areas, benches, etc. with active transportation projects, where opportunities exist.
Objective 4.B: Work with the Cities and County to develop Countywide Standard Wayfinding Signage System consistent with state and local standards to connect all residents and key destinations
Action 4.B.1: Support the development of a standard countywide wayfinding signage system to regionally direct bicyclists and pedestrian that can be adopted by local agencies to direct users to park-and-ride lots, transit, water transportation, and other key local destinations (i.e. downtowns, major entertainment areas, districts, services, etc.). Wayfinding signs should be consistent with existing state and local signage standards.
Objective 4.C: Promote Active Transportation Encouragement and Education Campaigns, through STA's Safe Routes to School Program, Solano Mobility, STA BAC and PAC, and Active Transportation Committee, along with participating member agencies.
Action 4.C.1: Develop a coordinated marketing strategy to encourage bicycling and walking in Solano.
Action 4.C.2: Develop a series of promotional/marketing incentives to encourage employees to use bike or walk to work.
Action 4.C.3: Encourage and expand the Solano Mobility bicycle incentives program.
Action 4.C.4: Periodically update the BikeLinks map for public distribution to reflect new bicycle facilities and information.
Action 4.C.5: Sponsor and support annual bicycle events such as Bike to Work Week, countywide bicycle tours, and adult safety courses in conjunction with other congestion management efforts

ENVIRONMENTAL STEWARDSHIP

Goal 5: Our transportation system should minimize environmental impacts including air pollution, roadway runoff, vehicle miles traveled, and greenhouse gas emissions.

Objective 5.A: Adopt Complete Streets principles in Solano County.
Action 5.A.1: Work with member agencies, MTC, and Caltrans to implement Caltrans Context-Sensitive Solutions and Metropolitan Transportation Commission's (MTC) Complete Streets policies as an approach to plan, design, construct, and operate a comprehensive multimodal transportation system.
Action 5.A.2: Encourage the continued practice of using of low-impact and universal design principles to help reduce run-off and provide accessible facilities.
Objective 5.B: Reduce greenhouse emissions by encouraging the reduction of vehicle miles traveled and encouraging active transportation.
Action 5.B.1: Explore opportunities for new development to fund active transportation projects that reduce vehicle miles travelled.
Action 5.B.2: Work with partner agencies, such as BCDC, Coastal Conservancy, and our member agencies to monitor the effects of sea level rise on active transportation facilities in affected zones and encourage mitigation where possible.
Objective 5.C: Continue to integrate Active Transportation facility improvements when planning for transit facility improvements to increase transit ridership.
Action 5.C.1: Continue to develop an intermodal transportation system, with active transportation elements, that serves the transportation needs of Solano County's residents, workers, and visitors in a manner that is compatible with characteristics of natural, economic, and social resources, where feasible.
Action 5.C.2: .Support Priority Development Areas by encouraging the implementation of active transportation facilities in these areas to link land use with transit service.
Action 5.C.3: Support the implementation of Caltrans Context-Sensitive Solutions Policy, as funding is available.
Action 5.C.4: Support and prioritize active transportation facilities that serve all multi-modal stations, ferry terminals, and park-and-ride lots in Solano.
Action 5.C.5: Support working with local and regional transit agencies to install bike lockers at terminals, bike racks on all buses, and designated storage areas on Capitol Corridor trains and ferries serving Solano.

COLLABORATION

Goal 6: Solano should work collaboratively with local and regional partners to realize shared active transportation values.

Objective 6.A: Maintain Active Transportation Plans.
Action 6.A.1: Continue to maintain the Solano Active Transportation Plan in coordination with our member agencies, which identifies existing and future needs, and provides specific recommendations for facilities and programs to be phased in over the short term (10 years) and long term (25 years).
Action 6.A.2: Encourage reviewing the projects identified in the Solano Active Transportation Plan annually to identify projects that have been completed and work to fund connected facilities.
Action 6.A.3: Encourage the use of the Solano Active Transportation Plan as a resource and coordinating document for local jurisdictions while utilizing existing /planned local bikeway facilities to the extent possible.
Action 6.A.4: Ensure that the STA's Solano Active Transportation Plan is consistent with all existing regional, state, and federal bicycle documents, and is consistent with current adopted local bikeway master plans.
Action 6.A.5: In collaboration with local and regional agencies, plan and implement inter-county bikeway connections (i.e. Yolo County, Napa County, Sacramento, and Contra Costa)
Encourage current policies that are consistent with MTC's regional bikeway network and periodically review regional bikeway network projects within Solano.
Action 6.A.7: Encourage current policies that are consistent with MTC's regional pedestrian-related plans and documents.
Objective 6.B: Continue to participate in and support Regional Public Active Transportation Committees, such as with Caltrans and MTC.
Action 6.B.1: Continue to encourage public participation and continuation of the Bicycle Advisory Committee (BAC) and Pedestrian Advisory Committee (PAC), and work with local active transportation related committees where possible.
Action 6.B.2: Encourage local jurisdictions to review projects with the Bicycle or Pedestrian Advisory Committee and to get support for grant applications.
Action 6.B.3: Continue regular meetings of the BAC and PAC; BAC and PAC members are encouraged to help member agencies develop local active transportation master plans and submit them for approval to local City Councils.

INVEST IN OUR VALUES

Goal 7: Solano takes pride in investing in active transportation as an aspect of our community by funding mobility options for residents in their everyday lives.

Objective 7.A: Continue to work with member agencies to develop selection criteria for active transportation projects and funding based on Solano's values.
Objective 7.B: Encourage consistency with local jurisdictions to facilitate project implementation and grant-readiness.
Action 7.B.1: Continue to collect and report on active transportation implementation information. Examples include the following: segment length, classification, adjacent traffic volumes and speeds, proximity to activity centers, cost, and overall feasibility to assist local jurisdictions with grant and funding applications.
Action 7.B.2: Make the Solano Active Transportation Plan available for adoption and endorsement by all local jurisdictions and the Board of Supervisors, if desired.
Action 7.B.3: Encourage the identification of quick build and rapid implementation projects that can be implemented by local jurisdictions for low costs.
Objective 7.C: Maximize Funding for Active Transportation.
Action 7.C.1: Maximize the amount of state and federal funding for bikeway and pedestrian improvements that can be received by providing technical assistance and grant support to local agencies.
Action 7.C.2: Identify current regional, state, and federal funding programs, along with specific funding requirements and deadlines.
Action 7.C.3: Encourage multi-jurisdictional funding applications of the regionally signification bicycle and pedestrian projects.
Action 7.C.4: Encourage local jurisdictions to identify and include projects from the Solano Active Transportation Plan their Capital Improvement Plans.

CHAPTER 3

Countywide Existing Conditions

The existing active transportation conditions were assessed to identify needs across the county and assess where potential projects could make the biggest impact. Existing conditions should also be used as a baseline to measure the implementation of this Plan over time.

Pedestrian Conditions

The pedestrian network within Solano consists largely of sidewalk infrastructure supported by crossing treatments, multi-use paved trails, and unpaved recreational trails. Sidewalk presence was used as the metric for pedestrian accessibility and was inventoried within incorporated jurisdictions and adjacent pockets of unincorporated communities.

Sidewalk Inventory

An inventory of existing sidewalks was conducted to identify sidewalk gaps across Solano (see Figure 11). A comparison of sidewalk coverage in each jurisdiction in Solano County is provided in Table 3 below.

Solano County has a total of 2,007 miles of existing sidewalk infrastructure, which includes the sum of sidewalk coverage on both sides of the street. With approximately 2,875 miles of maximum potential sidewalk coverage. This indicates that a large share of roadways in the county may have inadequate sidewalk coverage. Depending on land use context, there may be areas within Solano County (including within incorporated cities and unincorporated County areas) with rural characteristics where typical sidewalk infrastructure may not be compatible. However, it was not possible to exclude these areas from the overall sidewalk inventory evaluation.

Sidewalk coverage in Solano County was also evaluated in the equity focus areas as designated by the Metropolitan Transportation Commission for Priority Development Areas and Communities of Concern, or CalEnviroScreen Disadvantaged Communities. In Priority Development Areas, there are approximately 78 miles of sidewalk coverage. For Communities of Concern, there are approximately 431 miles of sidewalk coverage. Finally, within Disadvantaged Communities, there are approximately 65 miles of sidewalk coverage (see Figure 12). Overall, the need for sidewalk infrastructure is greatest in Communities of Concern, which may need about 128 miles of sidewalk gaps filled, depending on land use context. For more information about the equity focus areas see *Appendix B: Technical Analysis and Summary Memorandums.*

Table 3: Countywide Sidewalk Comparison by Jurisdiction

Jurisdiction	Miles of Existing Sidewalks	Maximum Sidewalk Coverage
Benicia Total	142	250
Dixon Total	120	151
Fairfield Total	564	830
Rio Vista Total	50	118
Suisun City Total	134	173
Vacaville Total	482	626
Vallejo Total	515	727
Countywide Total	**2,007**	**2,875**

Figure 11: Countywide Sidewalk Coverage

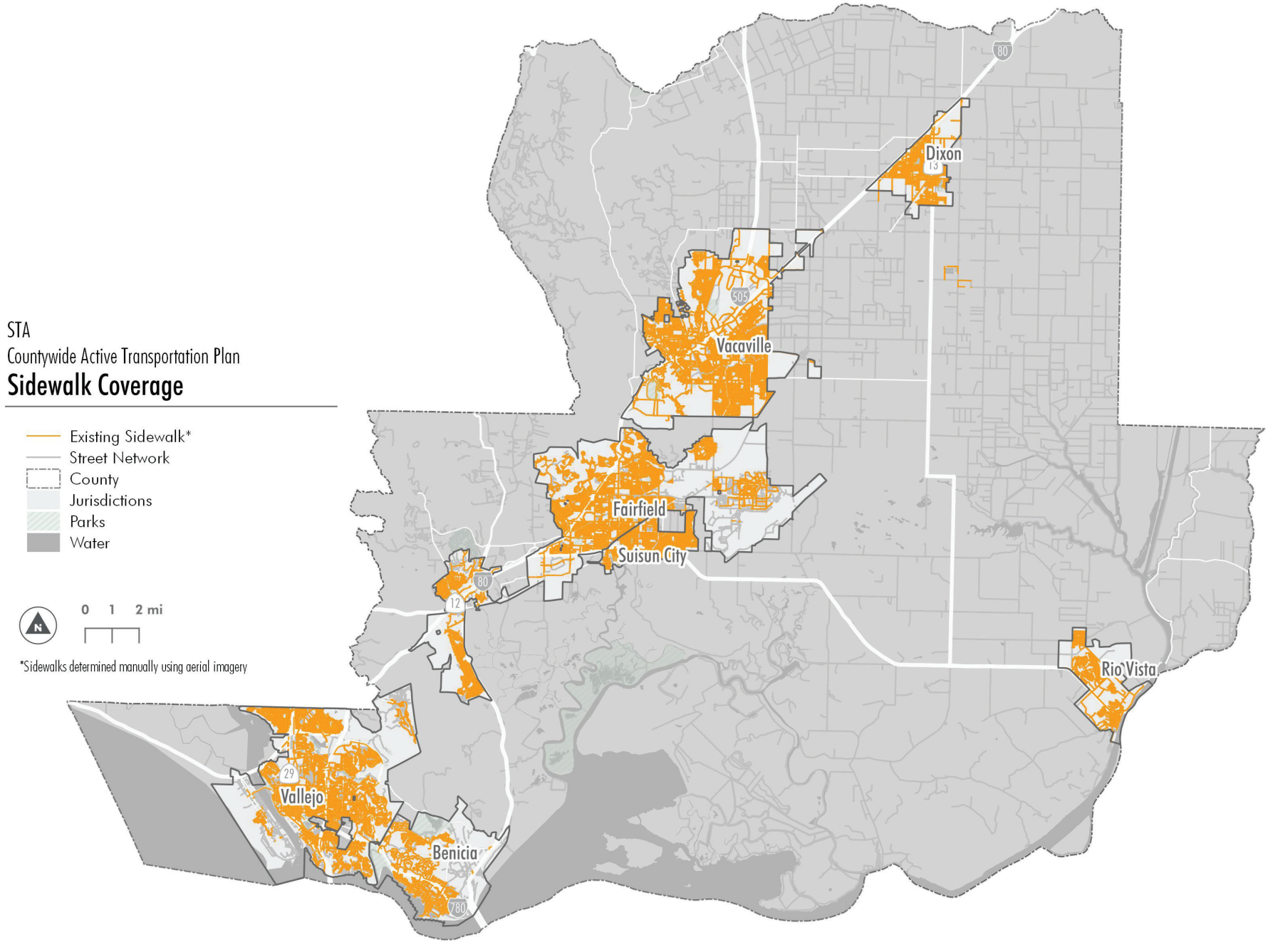


Figure 12: Solano Countywide Active Transportation Network Infographic

Sidewalk Network Inventory

	Existing Sidewalk Lane Miles	Full Sidewalk Buildout Lane Miles
Countywide	2,007	2,875
Priority Development Areas	78	148
Communities of Concern	431	559
Disadvantaged Communities	65	136

Bicycle Network Inventory

Bike Facilities	Mileage
Multi-Use Paths (Class I)	68
Bike Lanes (Class II)	137
Bike Routes (Class III)	26
No Designated Facility	1,206
All Roadways	1,437

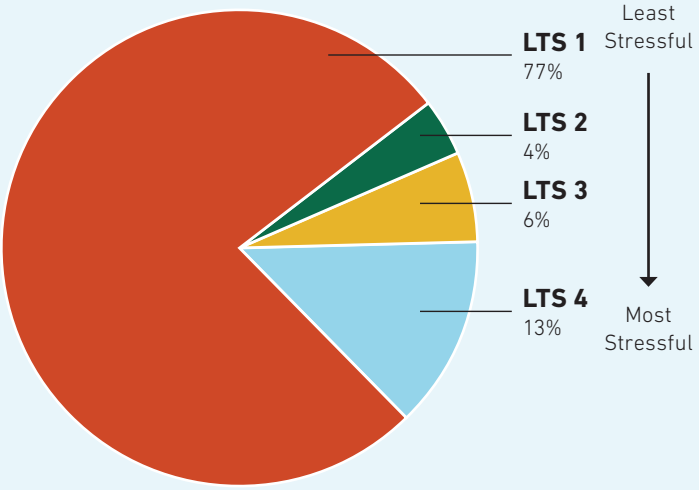
Citywide Bicycle Connectivity (BNA) Score

17

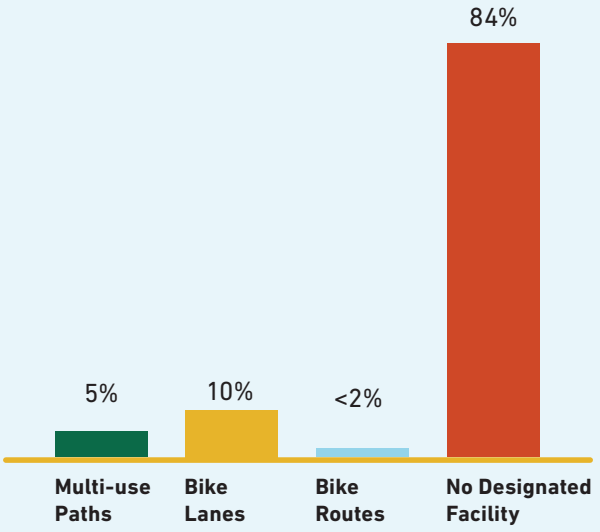
Low Connectivity **0→100** High Connectivity

Percent of Roadway Mileage

Level of Traffic Stress (LTS)



Bicycle Inventory



Bicycling Conditions

Solano County is home to many types of bicycle facilities, ranging from on-street signed bike routes to off-street shared-use paths (see Figure 13). The variety of bicycle infrastructure types reflects the differing needs present in Solano's diverse communities, which range from small, agriculture-focused municipalities like Dixon and Rio Vista to larger suburban cities like Fairfield and Vallejo. The comfort and connectivity of existing bicycle facilities were analyzed to identify opportunity areas for network improvements and to help with prioritizing potential projects. Analyses conducted as part of the existing bicycle conditions assessment include:

- Presence of Bicycle Facilities: An inventory of existing bicycle facilities was conducted for all roadways within the county.
- Bicyclist User Comfort: A Level of Traffic Stress (LTS) analysis identified how comfortable each facility is to the average "interested but concerned" rider.
- Bicycle Connectivity: The Bicycle Network Analysis (BNA) tool identified how connected areas are with low-stress facilities.

These analyses were conducted based on the premise that Solano's active transportation network should be comfortable for the greatest share of users and that it's design should encourage more people to ride. For more details about the methodologies and results of these analyses, refer to *Appendix B: Technical Analyses & Summary Memorandums.*

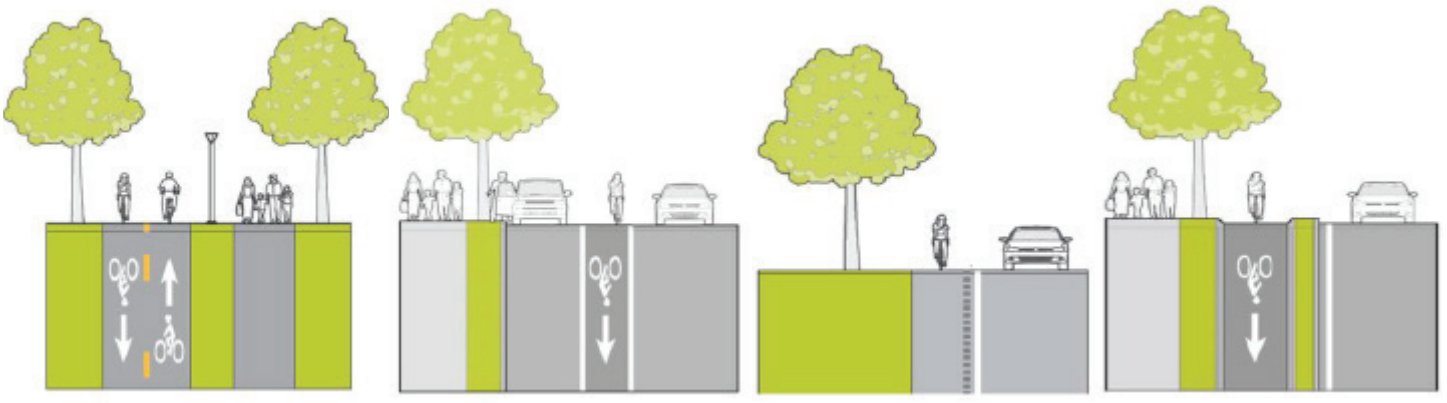
Presence of Bicycle Facilities

There are approximately 1,437 total roadway lane miles throughout Solano County with almost 250 lane miles of existing designated bicycle facilities. Currently, there are 68 miles of shared-use paths, 137 miles of bike lanes, and 26 miles of bike routes (Figure 14). A great majority of roadways in the county (84 percent) do not have any designated bicycle facilities. Many of the roads with bicycle facilities are in incorporated areas with denser bicycle networks (Figure 14). Limited bicycle network connectivity exists between incorporated areas, and where there is connectivity in these locations it is primarily only bike routes with simple signage. In general, the existing bike network serves destinations that are centrally located within the county's seven incorporated municipalities and regional recreational areas. However, there are several intercity bikeways, such as the Solano Bikeway and the Vaca-Dixon and Dixon-Davis bikeways.

Bicyclist User Comfort

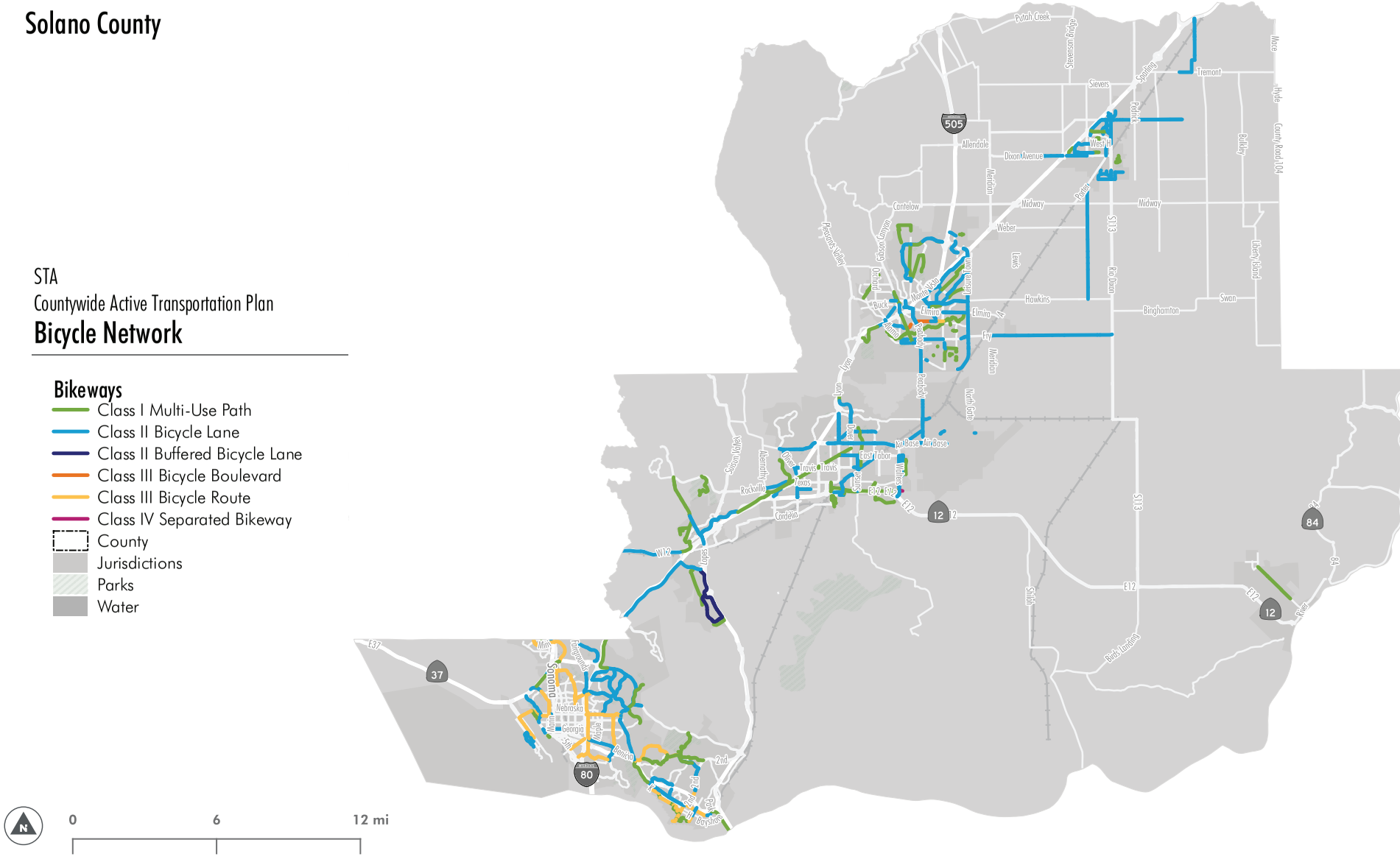
It is important to analyze the existing bicycle network's level of comfort, as this can indicate how many residents may choose to ride a bike for commuting, errands, and recreational trips. Comfort is determined by the speed and volume characteristics of vehicular traffic on segments within the network as well as the level of separation provided between the bicyclist and adjacent vehicular traffic.

Figure 13: Bicycle Facility Types



Class I Multi-Use Path (Off-Street) | **Class II Bicycle Lanes (Buffer Optional)** | **Class III Bicycle Route or Bicycle Boulevard** | **Class IV Separated Bikeway**

Figure 14: Countywide Existing Bicycle Network



One way to analyze bicyclist comfort in the existing bicycle network is through a Level of Traffic Stress (LTS) analysis. LTS is a rating given to an off-street bicycle facility, on-street bicycle facility, undesignated roadway segment, or crossing that indicates the vehicular traffic stress experienced by the "interested by concerned" bicyclist. It is based on the premise that a person's level of comfort on a bicycle increases as separation from vehicular traffic increases and as traffic volumes and/or speeds decrease. The LTS analysis is useful for identifying roadways or crossings that may benefit from upgrading an existing high-stress facility to a lower-stress option or recommending a new bicycle facility where one may not have previously existed. The analysis helps identify appropriate bicycle facilities that are comfortable for people of all ages and abilities.

LTS scores range from 1 to 4. LTS 1 scores indicate little or no traffic stress, and facilities with this score are generally suitable for most of the population. LTS 2 scores mean the user experiences some minimal traffic stress, but facilities are suitable for most adults and families. LTS 3 scores describe facilities with moderate traffic stress that are generally uncomfortable or unappealing to a large portion of bicyclists, but that may be suitable for somewhat experienced or confident bicyclists. LTS 4 scores include facilities with high traffic stress that are primarily only suitable for very confident bicyclists. Figure 15 provides examples of which types of bicycle facilities meet each LTS stress score.

This analysis emphasizes a "weakest link" method whereby the characteristic of any portion of a street segment that scores the highest stress level on a scale of 1 to 4 determines the score for that entire segment. For instance, a low-volume two-lane street with a speed limit of 40 mph would rate poorly with an LTS 4 score because of the higher speed limit.

Figure 15: Level of Traffic Stress Scores and Example Roadway Environments

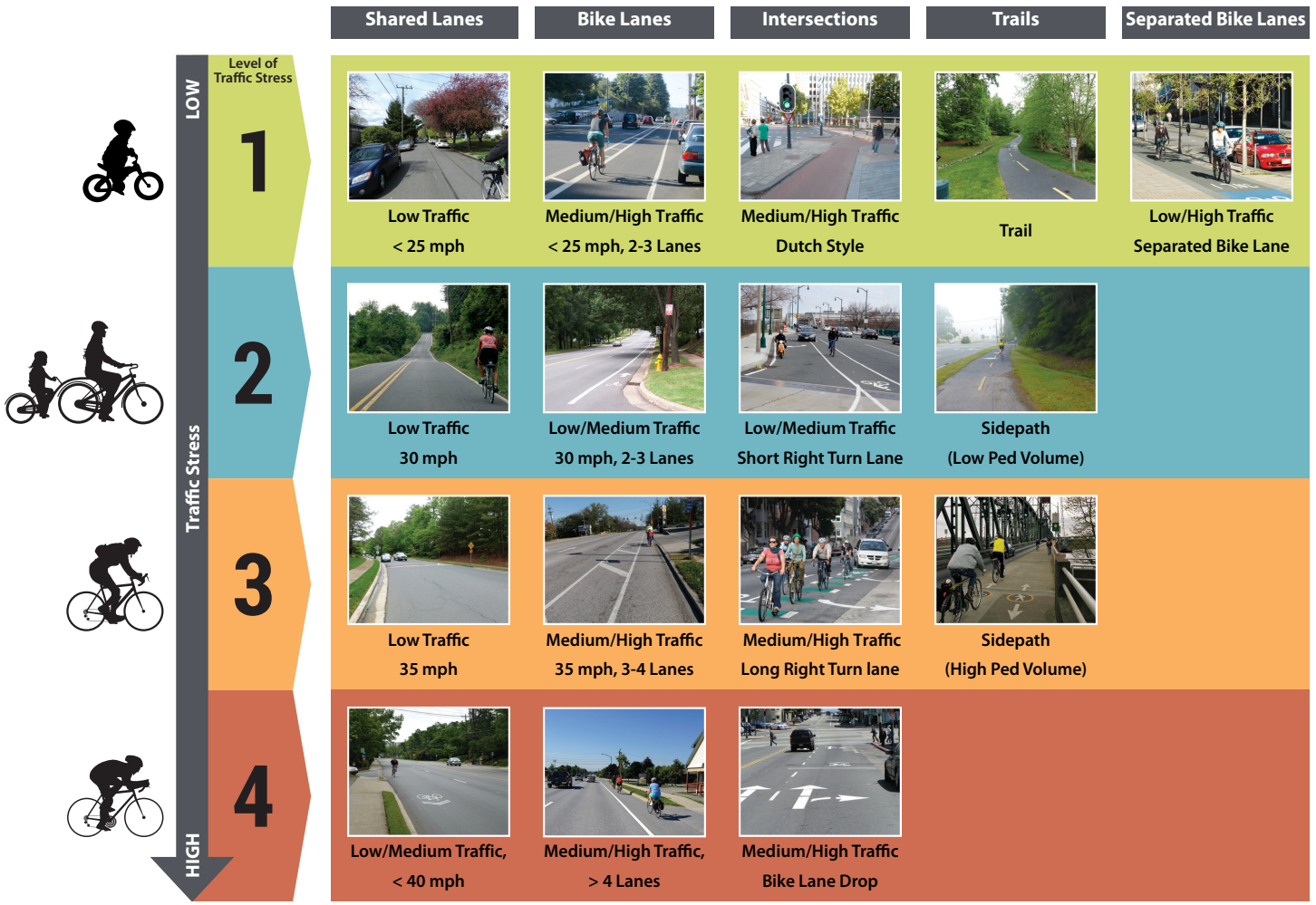
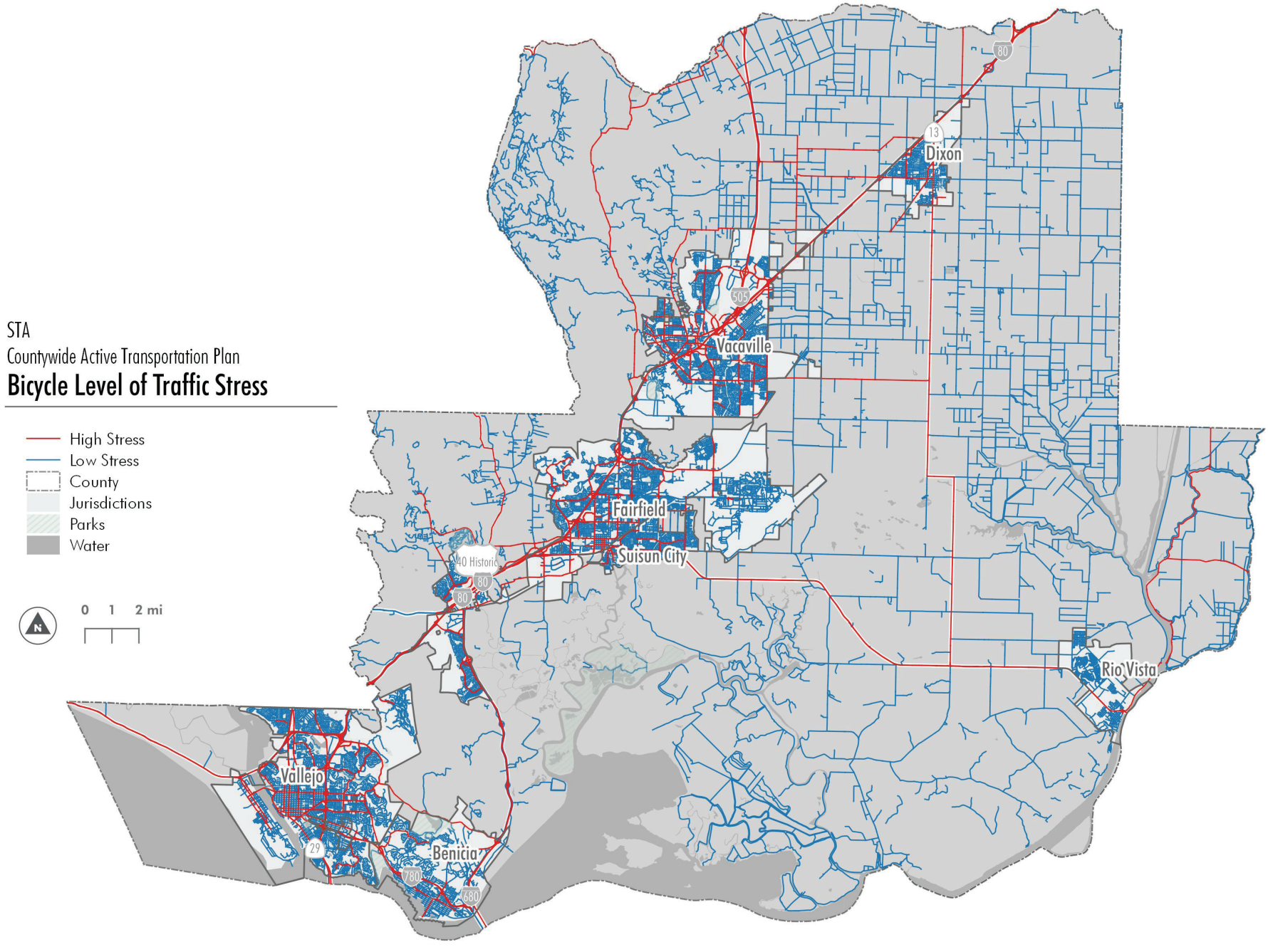


Figure 16: Countywide Bicycle Level of Traffic Stress



Solano County Level-of-Traffic-Stress Results

Figure 16 presents the LTS scores by percentage of the network for all on-street facilities and off-street shared-use paths in Solano County. LTS 1 is by far the most common classification (77% of lane miles) due to the large amount of low-speed, low-volume neighborhood streets. Roads with these characteristics often do not require designated bicycle facilities to be considered low-stress. Facilities provided on roadways with higher volumes and speeds also contribute to total LTS 1 lane miles. LTS 4 is the second most common comfort classification for roadways within the county (13% of lane miles). These include high-speed and high-volume roadways predominantly found in the county's incorporated areas, on major crosstown roadways. However, many examples of these can also be found in unincorporated areas (e.g., CA-12 and CA-113). Many LTS 4 roadways either have no designated bicycle facilities or have facilities that provide minimal separation from high-speed, high-volume traffic. While these high-stress routes are less common from a countywide perspective, they often form the backbone of municipal street networks and function as barriers to direct, low-stress travel within Solano County's incorporated areas.

Roadways that scored LTS 3 make up a relatively low amount of the network (6% of lane miles), while those that scored LTS 2 follow closely as the least common stress classification (4% of lane miles). It is important to note that this LTS analysis is limited to roadways where it is legal to ride a bike and therefore does not include limited access facilities (e.g., I-880). Off-street, unpaved trails are also not included.

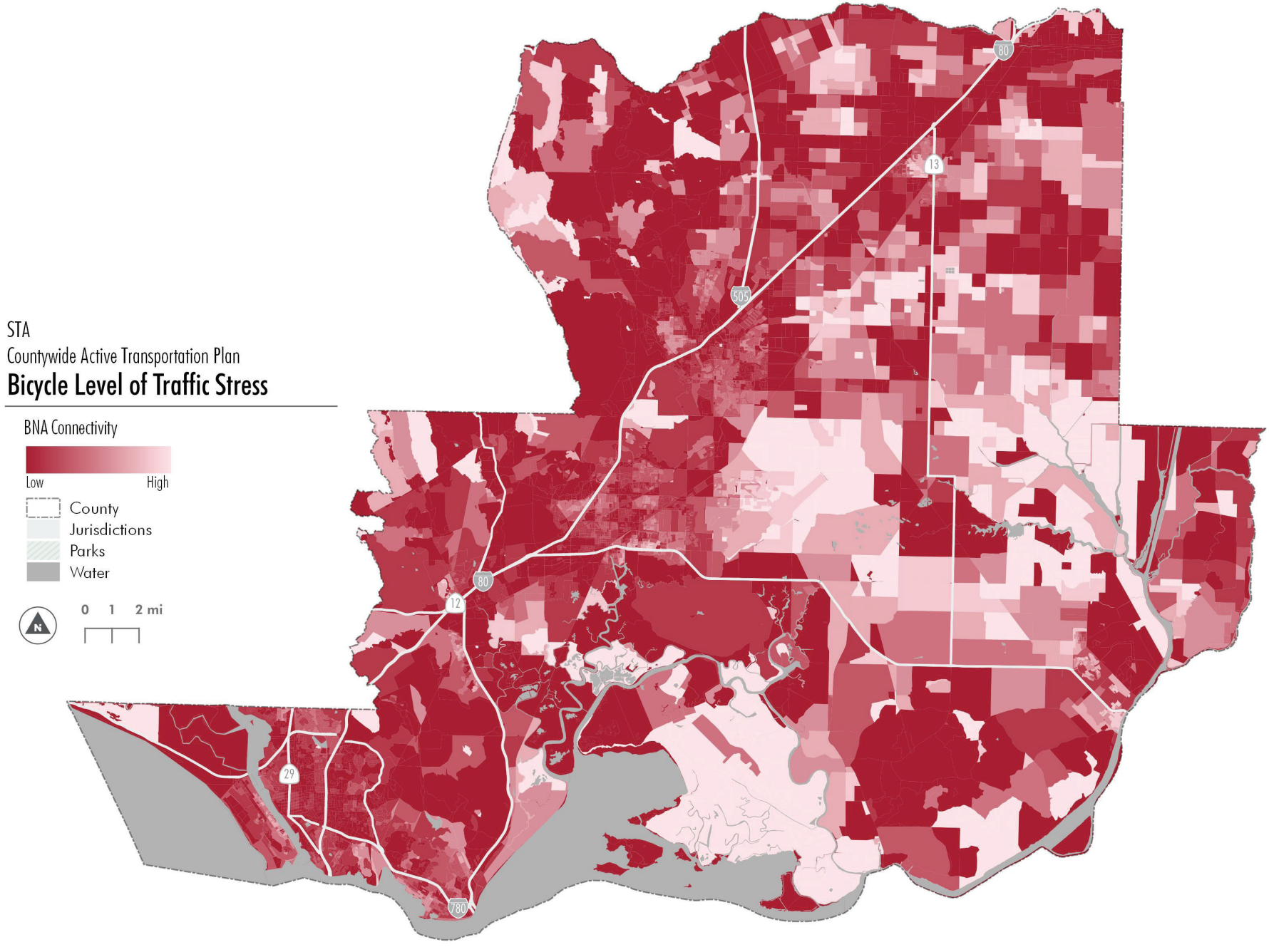
Bicycle Connectivity

The Bicycle Network Analysis (BNA) is a tool used to measure and score how well bicycle networks connect people with the places they want to go. The BNA score builds upon the Level of Traffic Stress analysis to measure how well the low-stress bike network connects to key destinations. The analysis highlights the importance of a continuous network, rather than a patchwork of bike lanes, trails, and multi-use paths. The analysis evaluates the connectivity of Census blocks to other Census blocks within a standard biking distance.

Solano County Bicycle Connectivity Analysis Results

The BNA results indicate that much of Solano County, and essentially all populated areas of the county, have low-to-medium connectivity as shown on Figure 17. Generally, the only areas with high connectivity are rural portions of the county with agricultural land uses or nature preserves where there are minimal destination types. These areas have few barriers to bicycle travel. Conversely, cities with high-volume, high-speed roadways and rural portions of the county adjacent to major transportation corridor barriers (e.g., I-80, CA-12 and CA-113, the Union Pacific railroad tracks) are difficult to travel between on a bicycle due to connectivity gaps and high-stress barriers, which generate low BNA scores.

Figure 17: Countywide Bicycle Network Analysis Connectivity



Countywide Collision Trends

Making streets safer for people walking and bicycling is a key goal of this Plan. This section presents a summary of the countywide active transportation collision analysis which was used to identify recommended projects.

Methodology

A systemic-safety approach was used to identify bicycle and pedestrian safety trends throughout Solano. The Project Team used the Equivalent Property Damage Only method, along with a hotspot analysis, and a review of existing active transportation safety projects to identify safety projects for each jurisdiction. For more information on the methodology of the collision analysis, as well as a more detailed summary of the results, see *Appendix B: Technical Analysis and Summary Memorandums*. For a summary of the recommended safety projects for each jurisdiction refer to *Appendix A: Local Jurisdiction Plans*.

The collision analysis included a total of 22,964 collisions which occurred in Solano County over a five-year period (2012 -2017). Of these collisions, 579 (2.5 percent) involved pedestrians and 391 (1.7 percent) involved bicycles.

Equivalent Property Damage Only Methodology

The Equivalent Property Damage Only (EPDO) method is a systemic-safety method used to identify system-wide safety issues and prioritize locations for safety interventions. This method serves to simultaneously review both the severity and frequency of collisions by weighting each collision based on injury severity and converting it to an equivalent number of property damage only (PDO) collisions. As shown below, collisions resulting in a more severe injury are weighted stronger than those with less a severe injury.

Table 4: EPDO Weighting Factor by Collision Severity

Collision Severity	EPDO Factor
Fatal and Severe Injury	100
Injury (Other Visible)	10
Injury (Complaint of Pain)	10
Property Damage Only	1

Results

Collisions involving bicyclists or pedestrians make up a disproportionately high share of EPDO composite scores compared to their share of total collisions in every jurisdiction in Solano County, including in the unincorporated areas (see Figure 19). This indicates that a disproportionate share of crashes involving active transportation users in Solano County result in fatal in severe injuries.

Countywide, the most common primary collision factors among pedestrian collisions were related to failure to yield right of way, pedestrian violations, and unsafe speeds; these collision factors were associated with 73 percent of pedestrian collisions. Similarly, the most common primary collision factors associated with bicycle collisions were related to violations associated with turning, traffic signals and signs, riding on the wrong side of the road, and failure to yield right of way; these collision factors were associated with 73 percent of bicycle collisions. Countywide, higher EPDO scores for collisions involving pedestrians were observed under dark conditions with street lights, suggesting that poor visibility may be an issue. Across the entire county, more bicycle collisions occurred at intersections than along street segments, except in Vacaville, where more collisions occurred along segments. A similar trend was true for pedestrian collisions, except in Benicia, Dixon, and Rio Vista, where more collisions occurred along street segments than at intersections. The recommended projects proposed for the active transportation backbone network can help address the segment and corridor issues identified in this plan. The design toolkit (see *Appendix C: Design Toolkit)* has treatments to address intersection-related issues.

Figure 18: Share of Total Collisions and EPDO Composite Scores Associated with Pedestrian and Bicycle Collisions in Solano County

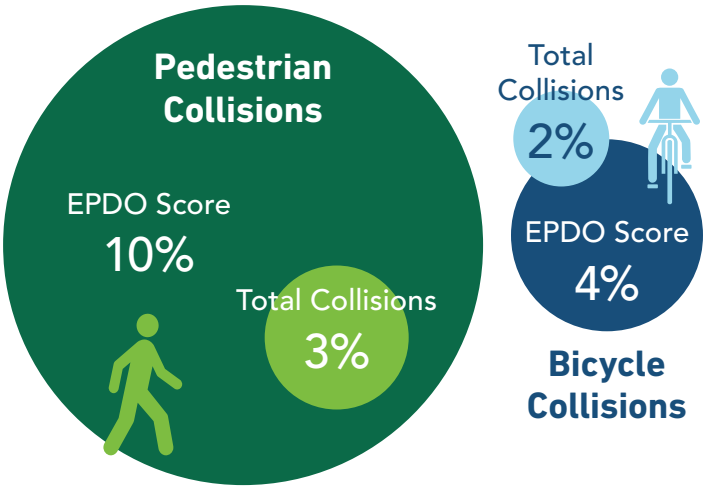


Figure 19: Countywide Bicycle Collision Map

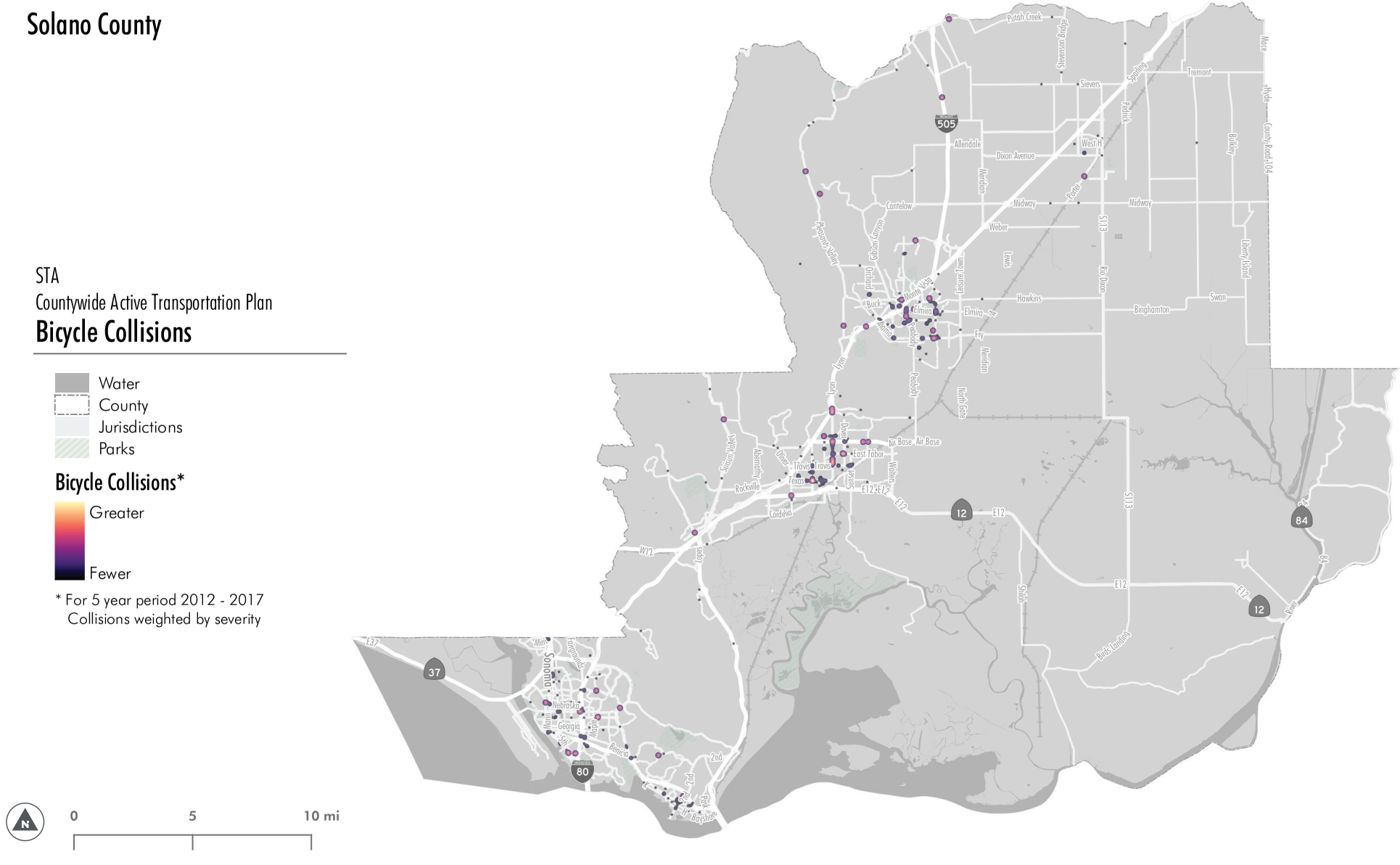
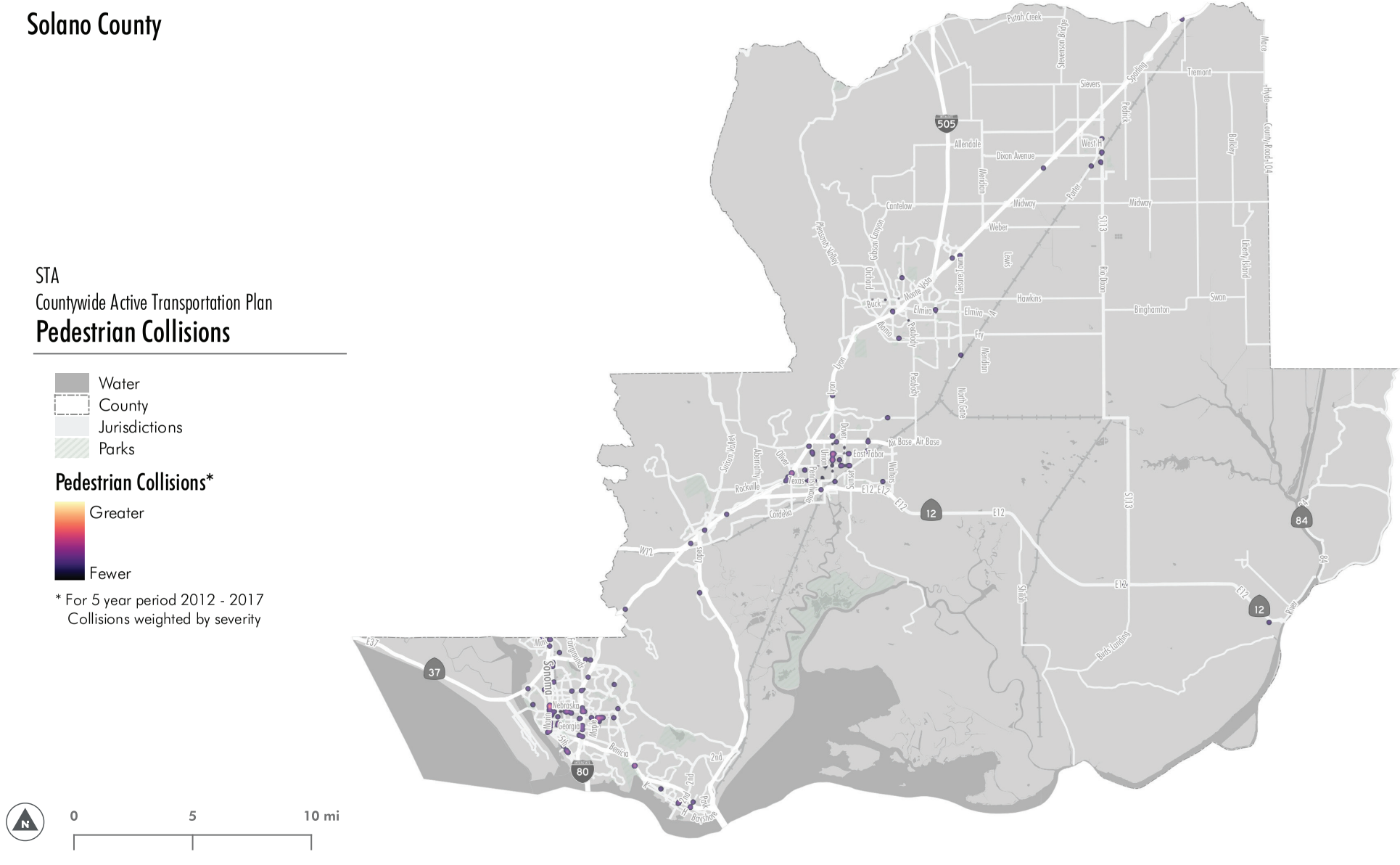


Figure 20: Countywide Pedestrian Collision Map



CHAPTER 4

Backbone Network Priorities

Countywide Backbone Network

One of the key purposes of the Solano Active Transportation Plan is to improve walking and bicycling conditions so that people of all ages and abilities feel comfortable traveling using non-motorized transportation options. This is accomplished through the creation of a countywide active transportation backbone network which is a network of facilities suitable for people of all ages and abilities. The network was developed by conducting a series of technical analyses combined with input from local jurisdictions and the public to identify areas which have the highest propensity to produce walking and bicycling trips. An assessment of existing pedestrian and bicycle facilities was conducted to determine whether they met certain all ages and abilities criteria.

The results of these analyses were used to develop the active transportation backbone network shown in Figure 22. The goal of the countywide active transportation backbone network is to link major destinations and residential areas to areas of countywide significance, like transit centers, and provide linkages across jurisdiction lines for cross-county travel. The primary analysis technique used to select the street and trail facilities included in the backbone network was an attractors and generators analysis which is explained in greater detail later in this section.

Two levels of backbone networks were developed:

- A countywide backbone network that links the top 25 highest composite demand areas throughout Solano; and,
- Local backbone networks that link the top 10 highest composite demand areas within each city.

Within each jurisdiction, the countywide backbone network routes were overlapped with the local backbone network routes where feasible. For more information on the analyses used to develop the backbone network refer to *Appendix B: Technical Analysis and Summary Memorandums* and to view the backbone networks for each jurisdiction refer to *Appendix A: Local Jurisdiction Plans.*

Figure 21: Class I Multi-Use Path in Vacaville

Countywide Attractors/Generators Analysis

Overview:
The goal of an attractors/generators analysis is to develop an understanding of the most likely network of bicycling and walking activity. The result is a conceptual network linking regional activity centers.

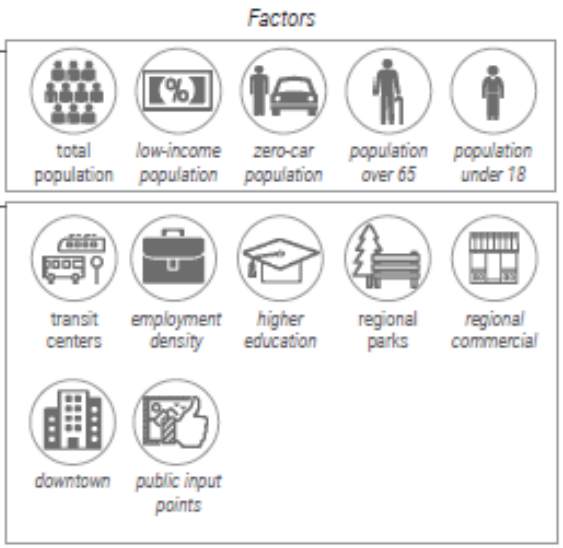
Process:

1. **Generators**
   Generator factors are demographic indicators that represent where the population or people more likely to walk or bicycle are located. Factors are measured at the census block or block group level.

2. **Attractors**
   Attractor factors are trip destinations and consist of factors that attract demand. Factors are scored on how many trips they are likely to attract based on ITE guidelines for trip rates.

3. **Attractor Generator Pairs and Composite Trip Demand**
   The composite trip demand between the activity centers is determined by adding the attractor trips and generator score, and multiplying the demand of each activity center by the distance decay factor between the zones. This total represents the number of trips that will occur between the two areas.

4. **High Demand Routes**
   The high demand routes are developed between the top 10 pairs. These pairs are identified below, including a generalized land use category.



Only the Top 10 attractors and generators are listed in the table above but the Top 25 lines were used to generate Origin-Destination lines.

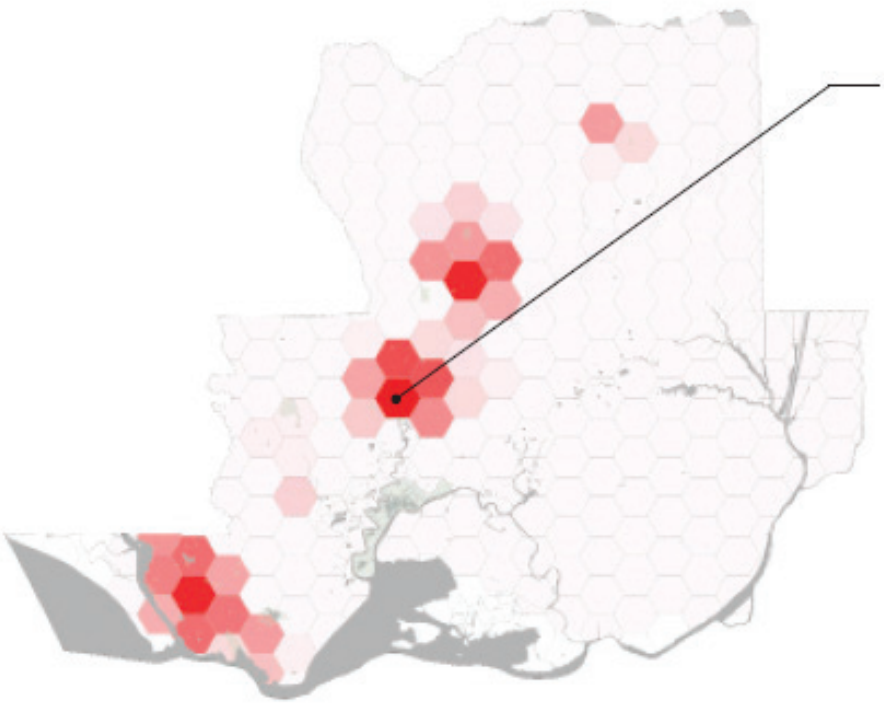
Top 10 Composite Demand Areas

Ref	Activity Center 1	Activity Center 2	Composite Trip Demand	Description
1	Downtown	Major Retail	1,914,796,155	Downtown Fairfield/Susuin City Waterfront to Walmart at Hawthorne and Orchid Street
2	Downtown	Residential/ School	1,791,667,108	Downtown Fairfield/Susuin City Waterfront toTabor park
3	Downtown/ Residential	Major Retail/ Residential	1,262,904,747	Downtown Vacaville to Alamo Drive and Peabody road
4	Downtown	Residential	1,202,082,727	Downtown Fairfield/Susuin City Waterfront to Hwy 12 and Sunset Ave
5	Downtown	Commercial/ Residential/ School	1,160,346,422	Downtown Vallejo to Springstowne Center
6	Downtown	Major Retail	1,105,795,004	Downtown Fairfield/Susuin City Waterfront to Solano Mall
7	Downtown	Downtown/ Residential/ School	979,763,401	Downtown Vallejo to Hederal Terrace Elementary School
8	Downtown	Major Retail	951,909,196	Downtown Vallejo to Solano County Fairgrounds
9	Downtown/ Residential	Major Retail/ Residential	922,374,038	Downtown Vacaville to Nut Tree Road and Nut Tree Parkway
10	Downtown	Commercial/ Residential	884,479,249	Downtown Vallejo to I-780 and Glen Cove Parkway

STA
Countywide Active Transportation Plan

❶ Generator Scores

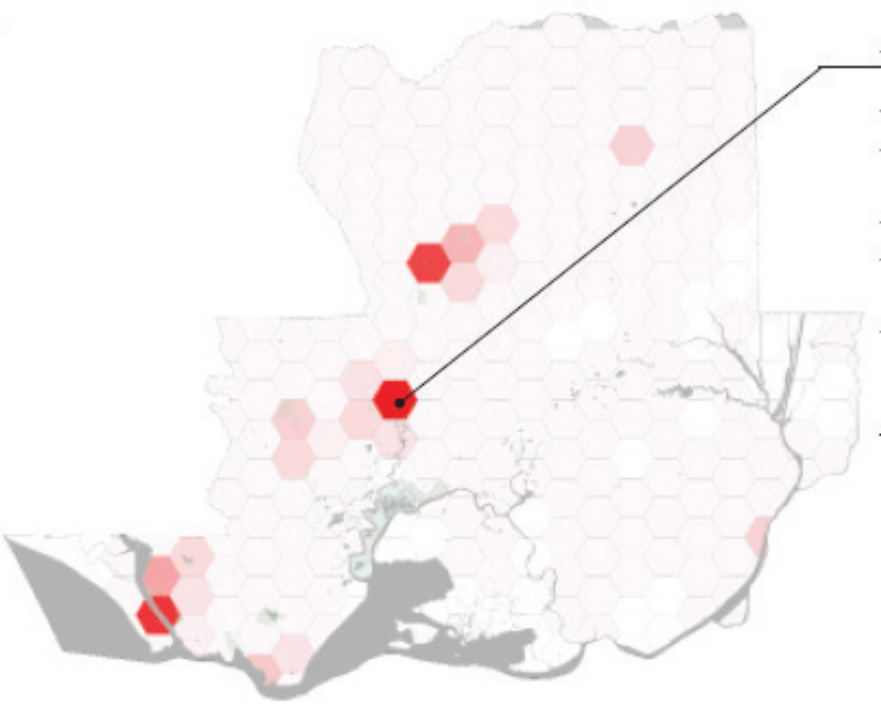
Low High



Generator	People
Total Population	53,146
Over 65 Population	4,235
Under 18 Population	12,674
Low Income Population	8,166
Zero Car Population	3,066
TOTAL GENERATORS TRIPS	**81,128**

❷ Attractor Scores

Low High



Attractor	Trips
Transit	225
Employment Density	12,421
Higher Education	0
Regional Parks	0
Regional Commercial	389
Downtown	25,640
Public Input Points	42
TOTAL ATTRACTORS TRIPS	**38,718**

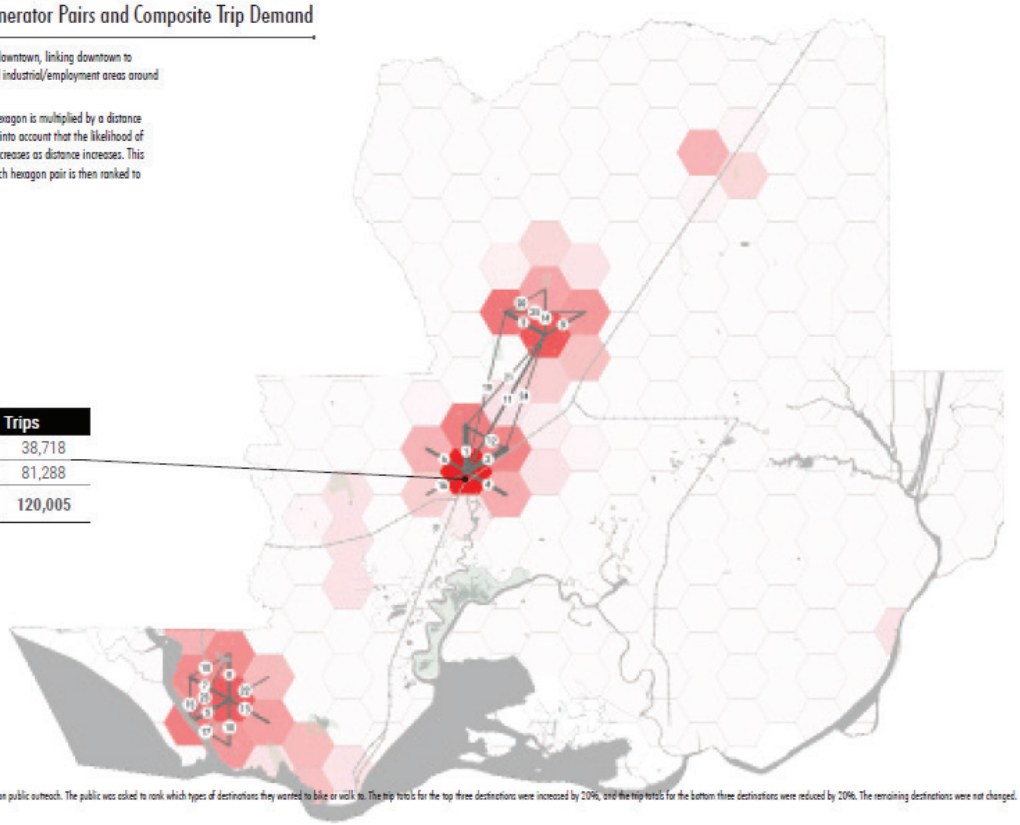
STA
Countywide Active Transportation Plan

❸ Attractor Generator Pairs and Composite Trip Demand

All the pairs start or end in downtown, linking downtown to residential, commercial, and industrial/employment areas around the city.

The total demand in each hexagon is multiplied by a distance decay function, which takes into account that the likelihood of traveling to a destination decreases as distance increases. This composite score between each hexagon pair is then ranked to determine the top ten pairs.

Total Demand	Trips
Attractors*	38,718
Generators	81,288
TOTAL TRIPS	**120,005**



* Attractors score was adjusted based on public outreach. The public was asked to rank which types of destinations they wanted to bike or walk to. The trip totals for the top three destinations were increased by 20%, and the trip totals for the bottom three destinations were reduced by 20%. The remaining destinations were not changed.

❹ High Demand Routes

The high demand routes are created by identifying routes along the street network, taking into consideration existing facilities, street classification, route directness, and other key destinations nearby. Routes were created using discretion regarding the context of the area and what was within or around the hexagon to maximize the demand that each route accesses.

Low — High

Countywide Routes

PRIMARY LAND USE

a.	Downtown
b.	Downtown
c.	Downtown
d.	Major Retail/Residential
e.	Major Retail
f.	Residential/School
g.	Commercial/ Residential/School
h.	Major Retail
i.	Downtown/Residential/ School
j.	Major Retail/Residential
k.	Commercial
l.	Residential/School
m.	Commercial/Residential
n.	Major Retail
o.	Commercial/ Residential
p.	Major retail/Transit
q.	Commercial/ employment
r.	Major Retail
s.	University
t.	Transit

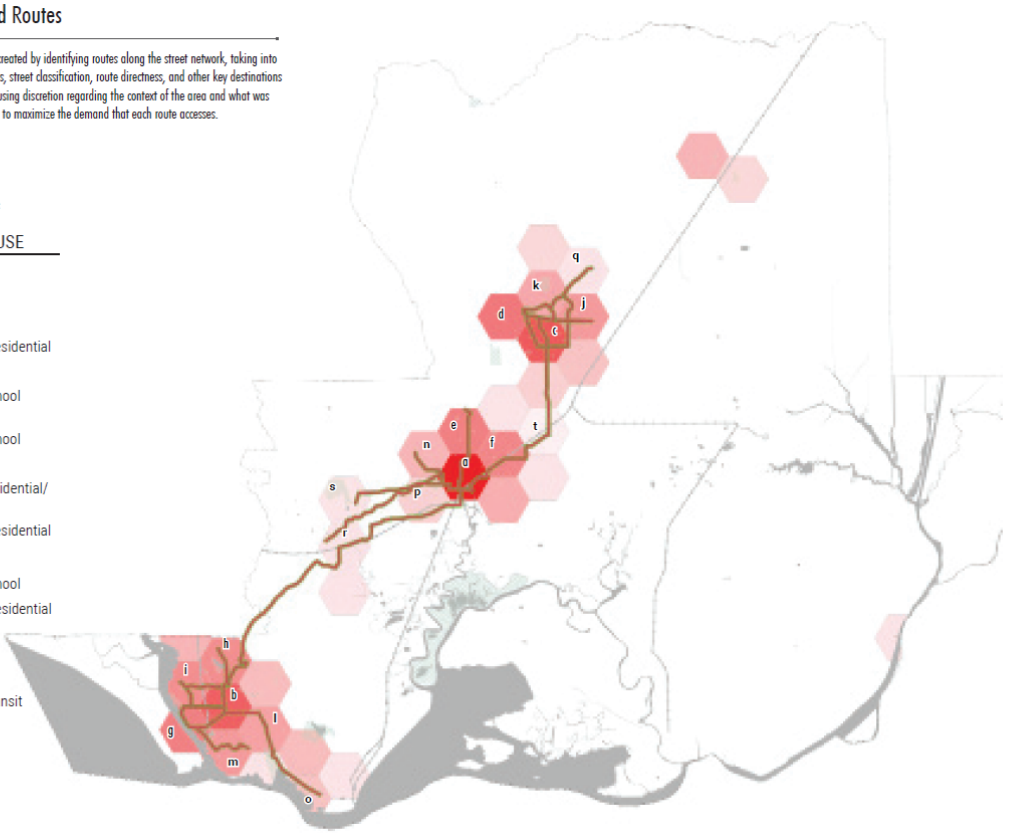


Figure 22: Countywide Backbone Network

Solano County

STA
Countywide Active Transportation Plan
Backbone Network

- Backbone Projects
- County
- Jurisdictions
- Parks
- Water

0 5 10 mi

Countywide Priority Projects

This section highlights the top priority projects needed to build out Solano's active transportation backbone network. Bicycle and pedestrian projects are listed separately in Appendix D: Countywide Active Transportation Recommended Project Lists and are shown in Figure 24 through Figure 26. Active transportation priority projects were identified based on whether the existing project would fill a gap in the countywide backbone network, for more details about the methodology used to identify gaps in the network and develop the list of priority projects, see below.

Regional Trails

The Plan Development Team felt that regional trails should all be high priorities throughout Solano County. Each of these trail networks offers a wide variety of recreational opportunities for many of Solano County's residents. The Solano County Active Transportation Plan represents a key step in identifying gaps that exist within this large network and will allow agencies to effectively target and subsequently fund projects that bridge these gaps. With prudent project selection that the Active Transportation Plan seeks to encourage, Solano County will possess a seamlessly integrated corridor of parks and trails that will create a healthy and active lifestyle for all Solano residents. Figure 27 identifies all regional and local jurisdiction Class I Multi-use Path projects throughout Solano (including some on-street linkages). A complete list of all Class I Multi-use Path projects is included in Appendix D: Countywide Recommended Active Transportation Project Lists.

Bay Area Ridge Trail

The Bay Area Ridge Trail is a planned continuous 550-mile multi-use trail encircling the ridges throughout the Bay Area. Envisioned by William Penn Mott Junior in 1987, the project set out to create a greenbelt throughout the nine Bay Area counties that would link the region's many parks. Currently over 380 miles of trails have been completed and opened to the public, stretching from Calistoga in the North Bay to Gilroy in the South Bay with over 75% of dedicated trails open to equestrian and bike usage.

Within Solano County, the currently opened trail segments include: The Vallejo-Benicia Waterfront (including Benicia State Recreation Area), Blue Rock Springs to Benicia, Hiddenbrooke Open Space, Lynch Canyon Open Space, Rockville Regional Park, and Ridge Trail through Fairfield, Vintage Valley Trail as well as the trails across the two bridges as part of the Carquinez Strait Scenic Loop Trail. These segments encompass a wide variety of ecosystems and difficulty levels, allowing users to experience the diverse landscapes that Solano County has to offer.

The Vine Trail

Proposed in 2008, the Napa Valley Vine Trail is a pedestrian and bicycle trail that connects the entire Napa Valley region. The project envisions an active transportation network that at completion would span from Calistoga southward to the Vallejo Ferry Terminal. As of 2020, there are 19 miles of trail available for usage in Calistoga, Yountville, Napa, and American Canyon. Within Solano County, there are two disconnected segments of the Vine Trail in North Vallejo that intersect the larger San Francisco Bay Trail. The Vine Trail and Bay Trail share a common alignment from Wilson Avenue to Lewis Brown Drive.

The Bay Trail

The San Francisco Bay Trail is an interconnected system of bike and pedestrian trails that abuts the shoreline of the Bay Area. Currently, 350 miles of trail are available from San Pablo Bay in the north to San Jose in the south. When completed, the trail will feature over 500 miles of multi-use paths that will link 47 cities and all 9 Bay Area counties. The Bay Trail connects with the Bay Area Ridge Trail throughout the region, creating a large scale and alternative commute system.

Within Solano County, the Bay Trail has existing segments along the Carquinez and Benicia bridges, along the Mare Island Straight and White Slough in Vallejo, along the Carquinez straight, and in Benicia. Trail gaps exist in Southern Vallejo and on Benicia Street. An Active Transportation grant will close Bay and Vine Trail gaps in Vallejo from the ferry north to the Napa County Line.

The Great California Delta Trail

In 2006 legislation, the Delta Protection Commission was tasked with developing the Great California Delta Trail System in response to the growing demand for public access to the Delta's natural resources, recognition of the importance of natural and rural places, and to acknowledge the value of outdoor recreation to healthy lives and communities. The Great California Delta Trail is a proposed corridor system of recreational trails that would link the San Francisco Bay Trail system and planned

Sacramento River trails in Yolo and Sacramento counties. Additionally, the trail will connect to park and recreational facilities and land and water trail systems throughout the Delta. Currently, the following five sections of the trail are open for access: West Sacramento River Walk, Sacramento River Parkway, Clarksburg Branch Line Trail, Big Break and Marsh Creek Trail, and the Carquinez Loop.

The Carquinez Strait Scenic Loop Trail

The Carquinez Strait Scenic Loop Trail (CSSLT) is a proposed 50-mile multi-use trail loop that brings together five regionally significant trails including the San Francisco Bay Trail, the Bay Area Ridge Trail, the Great California Delta Trail, San Francisco Bay Area Water Trail, and the Juan Bautista de Anza National Historic Trail. It provides opportunities for safe, continuous hiking, biking and human-powered boating around and within the Carquinez Strait by linking a magnificent mosaic of public lands that embrace the historic Carquinez Strait communities of Martinez, Benicia, Vallejo, Port Costa, and Crockett.

In Solano County (Vallejo and Benicia), the CSSLT hugs the shoreline offering sights and sounds along the water and providing views of the Strait and the surrounding landscape from two interstate bridges, the Al Zampa Carquinez Bridge (Interstate 80) on the west and the Benicia-Martinez Bridge (Interstate 680) on the east.

Network Gap Methodology

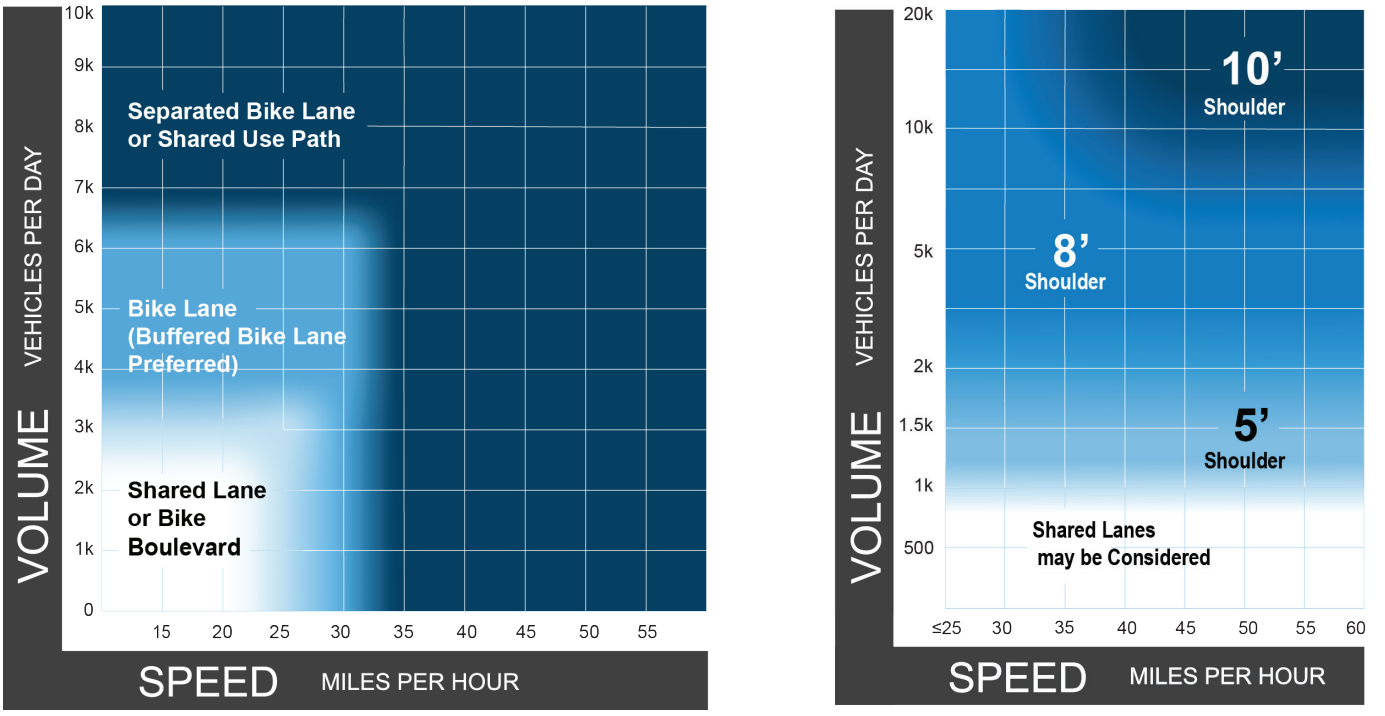
The Project Team conducted separate bicycle and pedestrian network gap analyses to identify projects to complete the backbone network. Bicycle network gaps were identified by assessing which additional facilities would be needed to complete the backbone network and whether existing facilities would need to be upgraded to be comfortable for people of all ages and abilities. The decision to upgrade facilities was based on existing bikeway selection best practices (see Figure 23) and a review of local roadway characteristics, including:

- Existing facility type (if present),
- Right of way width,
- Traffic volume,
- Traffic speed,
- Presence of on-street parking, and
- Presence of heavy vehicle routes such as buses and trucks.

These same characteristics were used to determine which type of bikeway could be recommended in locations along the network where no bike facilities currently exist.

Pedestrian priority projects were selected based on sidewalk presence and the need for crossing treatments. Sidewalk gaps were identified using the countywide sidewalk inventory and crossing improvement projects were identified from walk audits with stakeholders, previously identified pedestrian projects, such as those identified in previous Safe Routes to School and Safe Routes to Transit projects, and the results of the collision analysis. Sidewalk gap and crossing improvement projects were selected for the priority project list if they were located along the countywide backbone network.

Figure 23: Bikeway Selection Charts



The chart on the left was used for selecting bikeways in urban areas and the chart on the right was used only for rural, unincorporated Solano County roadways.

Table 5 shows the estimated mileage of bikeways needed to complete the countywide backbone network by bikeway classification. These projects make up the bicycle priority project list. The pedestrian network gap analysis identified 54 miles of sidewalk gaps and eight crossing improvement projects along the backbone network.

Table 5: Miles of Bikeway Needed to Complete Countywide Backbone Network

Bikeway Classification	Miles of Bikeway along Countywide Backbone Network
Class I Multi-Use Path	3.1
Class II Bicycle Lane	6.3
Class II Buffered Bicycle Lane	13.2
Class III Bicycle Boulevard	4.8
Class III Bicycle Route	1.6
Class IV Separated Bikeway	13.5
To Be Determined	5.7
Total	**48.2**

Figure 24: Bicycle Priority Projects

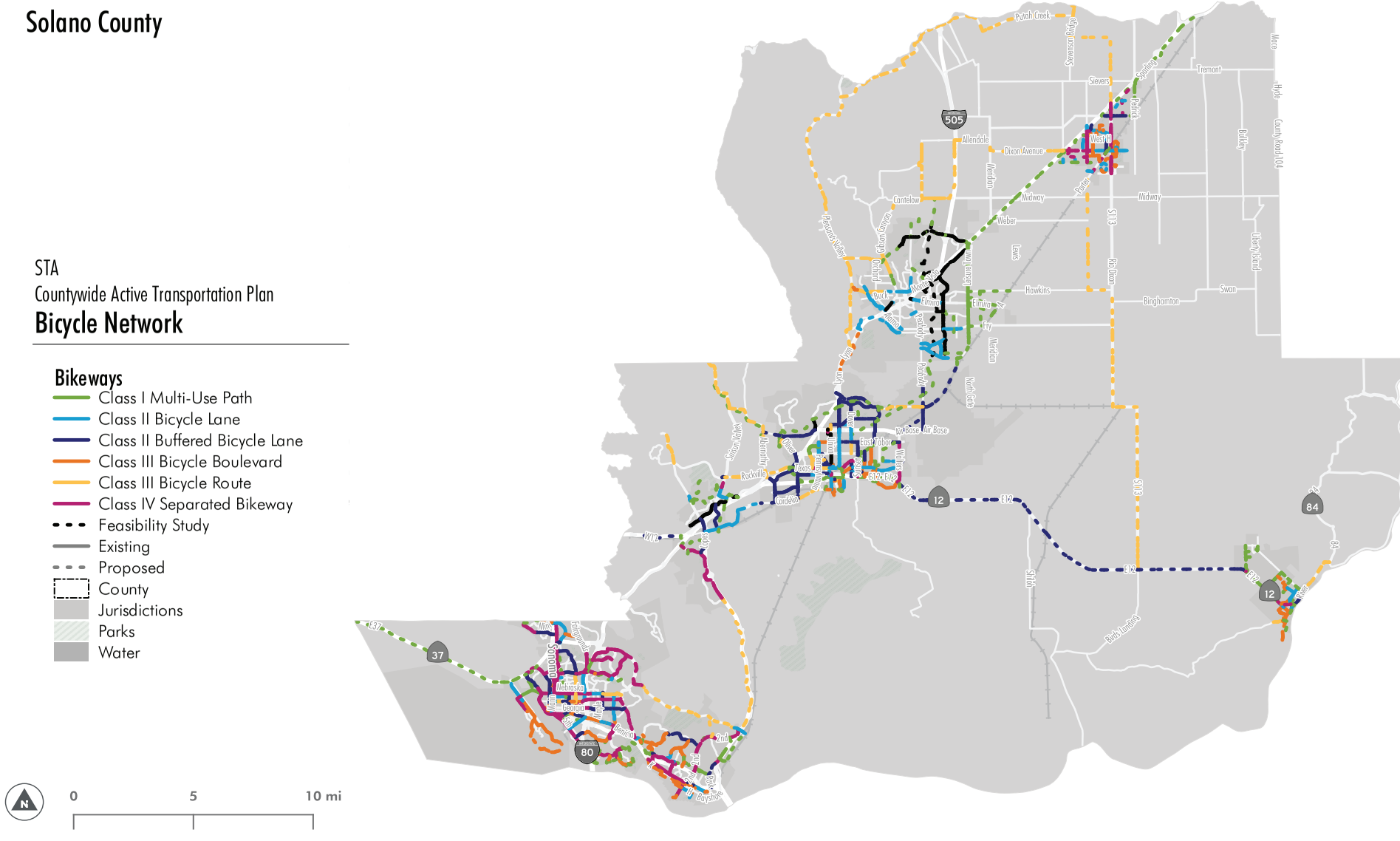


Figure 25: Bicycle Priority Projects along the Backbone Network

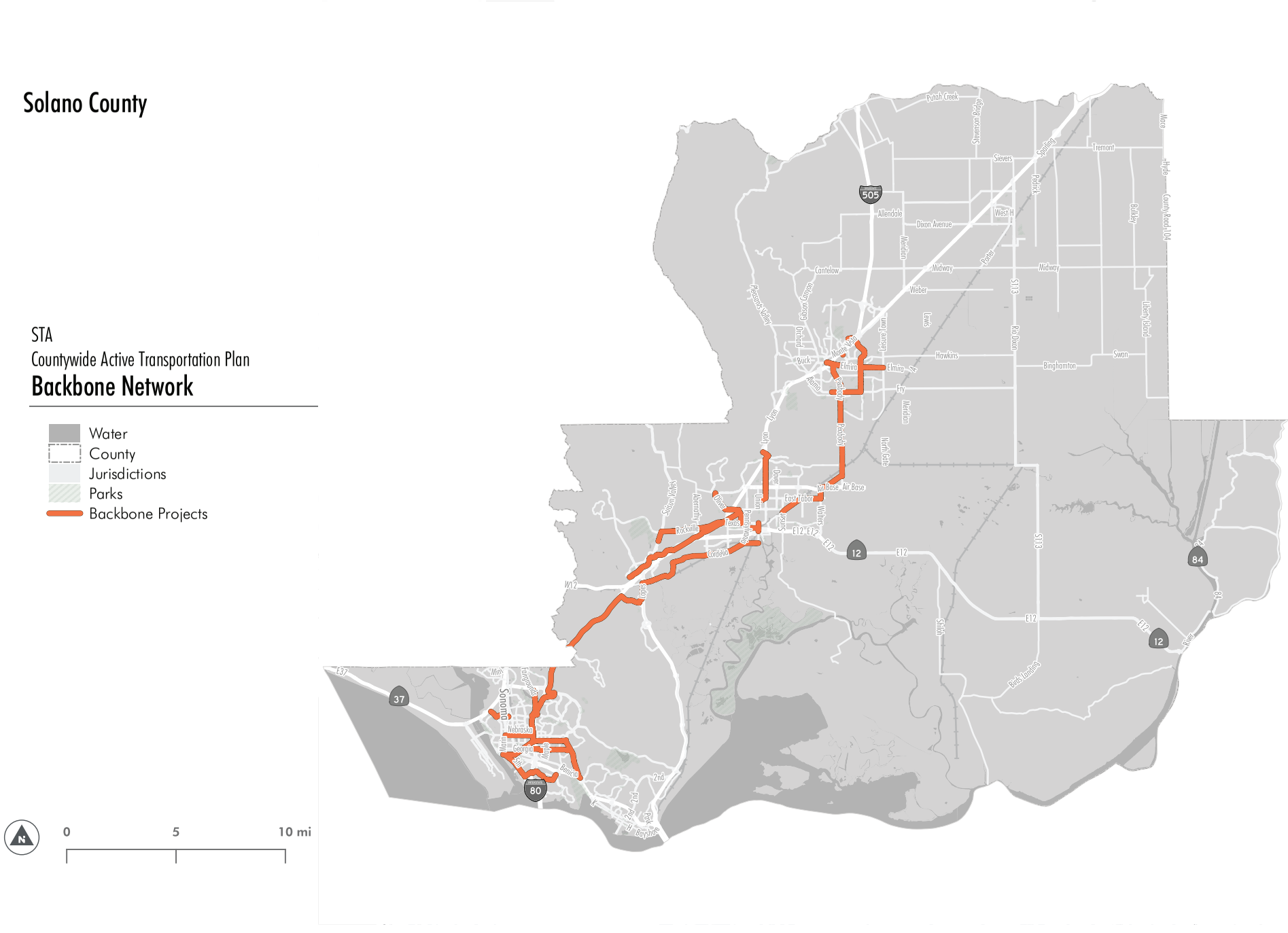


Figure 26: Pedestrian Priority Projects

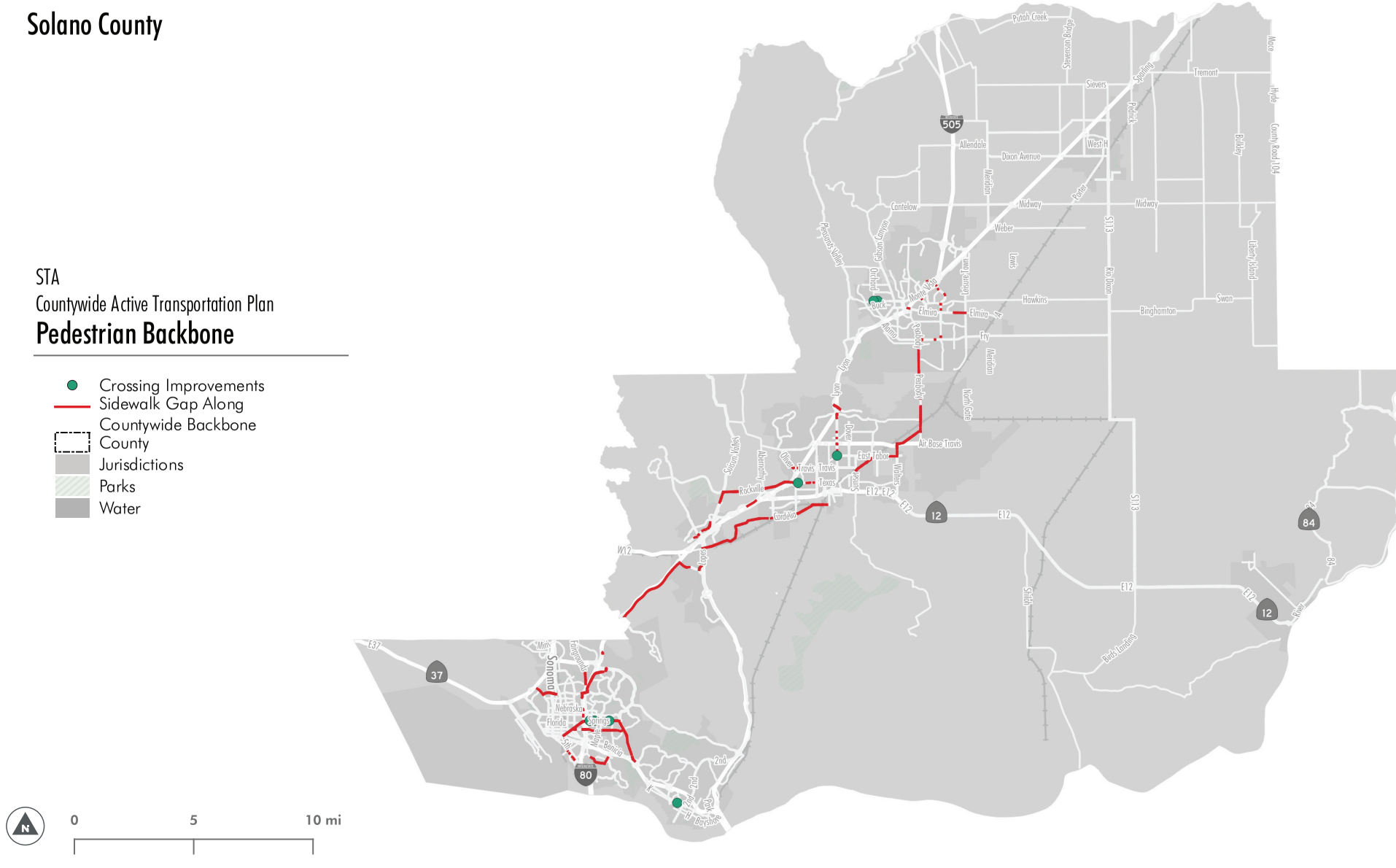


Figure 27: Regional Trails and Local Jurisdiction Off-Street Trail Priority Projects

Supportive Programs

Infrastructure improvements are critical to developing an all ages and abilities network, however, supportive programs are an important component of a countywide active transportation program and play a key role in achieving the Solano Countywide Active Transportation Plan's seven goals. Below is a summary of existing active transportation programs and a description of recommended projects aimed to address key elements of active transportation planning, such as safety, education, encouragement, and maintenance.

Existing Programs

The Solano Transportation Authority (STA) coordinates three primary programs to support active transportation throughout the region.

Safe Routes to School

The Solano Safe Routes to School (SR2S) program encourages children to safely walk or bike to school and supports this effort with free, fun, and educational events and programs for students. The program works with schools, police, public health staff, city traffic engineers, and other community members to improve traffic safety and the health and well-being of youth in Solano County.

Solano First/Last Mile Mobility Program

This program provides a consolidated website, call center, and resources to assist Solano residents with accessing transportation options throughout the county. The program also provides information and assistance for seniors and people with disabilities to find mobility solutions that fit their needs. The program also funds travel trainings, including transit orientations, to teach people how to use transit at large as well as more specific features like bike racks which hold four bikes or ADA lifts.

Figure 28: Solano County has a growing Safe Routes to School Program

SolanoExpress Bus

STA provides this express intercity bus service throughout Solano County, with individual routes operated by Fairfield Suisun Transit (FAST) and Solano County Transit (SolTrans). The call center is also managed by STA and assists potential users with creating personalized trip plans to meet their access and travel needs.

Recommended Programs

The recommendations listed in Table 6 were selected based on a review of existing active transportation plans, policies, programs, and nationwide best practices. Another program that is critical for enhancing the region's active transportation network is wayfinding. *Appendix B: Technical Analysis and Summary Memorandums* includes guidance and a summary of best practices which can be used to implement a countywide wayfinding program.

PlanDevelopment Team Staff spoke with key stakeholders to identify the top five recommendations that should be prioritized. These recommendations are shown in red in Table 6 and are discussed in greater detail below.

Table 6: Summary of Recommendations to Support Active Transportation Programs, Policies, and Practices

Topic Area	Recommendations
Safety	» Develop a regional Vision Zero or other safety-related policy and provide a framework for local jurisdictions » Develop rapid implementation guidance » Coordinate with local and regional agencies to encourage trail safety patrols » Provide guidance for a bicycle safety and light distribution program for local homeless populations
Education	» Create a police officer bicycle education and training program » Identify funding and coordinate League Cycling Instructor (LCI) trainings » Develop a Safe Routes for Seniors program » Conduct bus operator trainings » Continue to support and expand the countywide Safe Routes to School program while expanding to include Safe Routes for Seniors » Conduct motorist education » Continue to implement a traffic safety education program
Encouragement	» Provide guidance for tactical urbanism and open streets events » Develop a non-motorized road user count program » Develop equity and inclusivity frameworks and provide guidance for outreach and project implementation » Encourage transportation demand management programs including employer programs » Provide resources and coordinate the implementation of a wayfinding signage program » Encourage the formation of a bicycle coalition » Create a marketing and encouragement program for active transportation » Develop active transportation promotional materials
Enforcement	» Provide guidance for bike theft deterrent signage and a bait bike program » Provide support for traffic ticket diversion programs » Develop a bicycle licensing and registration program
Maintenance	» Develop a jurisdiction maintenance agreement program for trails (Class I) and separate bikeways (Class IV) » Provide resources for a volunteer maintenance program for active transportation facilities » Maintain Pavement Conditions Index (PCI) program
Multimodal Mobility and Transit Access	» Develop a micromobility and bikeshare policy and research micromobility program feasibility » Provide resources for a transit stop improvement program » Provide resources and guidance for best practices related to multimodal impact fees » Provide guidance and encourage local adoption of bicycle parking standards » Support the expansion of the bikes on buses program and conduct studies to explore the storage of more than two bicycles on buses » Encourage jurisdictions to adopt Complete Streets policies and develop an evaluation framework
Local Agency Support	» Coordinate best practice technical trainings for jurisdiction staff » Provide grant assistance to local jurisdictions seeking funding for active transportation projects » Provide corridor study implementation assistance

Top Five recommendations

1. Continue to support and expand the countywide Safe Routes to School program while expanding to include Safe Routes for Seniors

Safe Routes to School (SR2S) Programs provide opportunities to improve bicycle and pedestrian safety, develop the active transportation facilities, and encourage students (and their families) to get in the habit of walking and bicycling. Solano Safe Routes to School already provides a variety of resources to schools including program guidance and funding opportunities. However, the existing program does not reach all students and could provide more support for schools. STA should explore ways to increase participation in SR2S programming across all schools, by providing guidance and funding to support projects like walk audits, infrastructure improvements, additional programming, and reaching out to schools currently not participating in the program.

2. Continue to implement traffic safety education programs

Traffic safety education programs can improve roadway safety for all users. These programs can provide specific materials and trainings specific to drivers, bicyclists, and pedestrians, but they can also support education campaigns directed towards all road users. Traffic safety programs focus on general roadway behavior and learning the rules of the road; they can also target specific dangerous behaviors, such as driving while under the influence, distracted driving, speeding, or yielding right of way to pedestrians. The California Office of Traffic Safety is a well-known, statewide resource for traffic safety funds which can be used to support a traffic safety education program in Solano. STA received two Office of Traffic Safety grants in 2017/2018.

3. Maintain Pavement Conditions Index (PCI) Program

Smooth pavement is an important part of active transportation network connectivity and safety. It is important for transportation agencies to proactively monitor pavement conditions to ensure that roadway improvements are made where they are needed most, and not just along streets where residents complain the loudest. The Federal Highway Administration recommends using the Pavement Conditions Index (PCI) to monitor pavement conditions on a regular basis. The PCI is a numerical value between 0 and 100 that is calculated from a visual survey of pavement distress on a sample of the network. Various distress/severity combinations result in points deducted from the starting value of 100. PCI measures two conditions, the type, extent, and severity of pavement surface distress; and road smoothness and ride comfort. Trail pavement conditions should also be maintained in this list and have set targets for repaving to ensure off-street facilities are suitable for people walking or biking.

4. Encourage jurisdictions to adopt and implement Complete Streets policies

Complete Streets are roadways planned, designed, operated, and maintained for safe and convenient access by all users—including bicyclists, pedestrians, people with disabilities, and transit riders. In 2008, the California Complete Streets Act was signed into law. It requires all cities and counties to include Complete Streets policies in general plans in all substantive revisions of the circulation element. The San Francisco Bay Area Metropolitan Transportation Commission also requires all jurisdictions (cities and counties) to adopt a Complete Streets policy to access One Bay Area Grant funding. STA can assist with this effort by providing resources, such as sample policy language and project evaluation frameworks, to local jurisdictions.

5. Provide grant assistance to local jurisdictions seeking funding for active transportation projects

In many communities, the majority of active transportation projects are dependent on grant funding. Finding and writing grants, and compiling the necessary documentation, is time consuming and resource intensive for local jurisdiction staff. This serves as major barrier for communities who are interested in implementing active transportation projects, but may not have enough staff time to write and organize grants. By providing resources and information to local jurisdictions, county and regional agencies, like STA, can help get active transportation projects funded and implemented by providing contract consultant support to augment local staff time.

CHAPTER 5

Implementation and Funding

The Solano Transportation Authority should work with local jurisdictions to implement and fund the active transportation projects outlined in this Plan.

Prioritization

The first step to considering which projects should implemented was to prioritize bicycle and pedestrian projects for each jurisdiction. The prioritization process uses a set of categories that are scored for each project in order to create ranked project lists. It should be noted that projects do not have to be implemented in the order they are presented, rather this is intended to be used as a tool for assisting local jurisdictions with understanding which projects may have the most benefits and/or qualify for potential grant funding.

The prioritization categories were presented to the Plan Development Team along with a breakdown of the meaning and relevance of each category to ensure that they understood the purpose and scope of the process. After the material was presented to the entire group, each jurisdiction selected their individual local weighting factors in an online survey. Once the weighting factors and local scoring criterion were finalized, the prioritization analysis was run for each jurisdiction to develop a preliminary ranking of projects for review by STA and each jurisdiction. Once comments were received and the draft project rankings were reviewed, jurisdictions were allowed to adjust their weightings once to test how different factors affected the final scoring prior to finalizing the lists. Additionally, jurisdictions were able to request one additional criteria to include in their individual scoring.

Bicycle Scoring Categories

The following criteria was used to score bicycle corridor projects presented in each jurisdiction's chapter:

- **Demand and Key Destinations** – Connection to Backbone Network, derived from Attractors/Generators Analysis to show which routes have the highest propensity for supporting walk and bike trips
- **Connectivity** – 5 in 5 connected network public engagement activity results
- **School Access** – Based on a specific distance threshold to schools
- **Transit Access** – Based on distance to major transit centers or transfer stops
- **Safety** – Existing crash frequency and potential to improve safety
- **Equity** – Location or usage by disadvantaged or isolated communities
- **Funding** – Does the project have an identified potential source of funding. The scoring criteria for this category may be very dependent on local preference
- **Comfort**– All Ages and Abilities vs. Gap Closure and Connectivity Network

Pedestrian Scoring Categories

The following criteria was used to score pedestrian projects presented in each jurisdiction's chapter:

- **Demand and Key Destinations** – Connection to Backbone Network, derived from Attractors/Generators Analysis to show which routes have the highest propensity for supporting walk and bike trips
- **School Access** – Based on a specific distance threshold to schools
- **Transit Access** – Based on distance to major transit centers or transfer stops
- **Safety** – Existing crash frequency and potential to improve safety
- **Equity** – Location or usage by disadvantaged or isolated communities
- **Funding** – Does the project have an identified potential source of funding. The scoring criteria for this category may be very dependent on local preference

Prioritization Scoring Criteria

Each prioritization category includes set scoring criterion based on various factors related to each category. The prioritization scoring criteria is provided below in Table 7.

Table 7: Prioritization Scoring Criteria

Category/SubCategory	Criteria	Points
Demand and Key Destinations	*(Based on Attractors/Generators analysis)*	**5**
	Countywide and local backbone network	5
	Countywide backbone network only	4
	Local backbone network only	3
	Not located on a backbone network	0
Connectivity	*(Bike Only - Based on 5 in 5 Outreach Activity)*	**5**
	Highly Requested (High)	5
	Minimally Requested (Low)	3
	Not Requested (None)	0
School Access		**5**
	Within ¼ mile	5
	Between ½ mile and ¼ mile	4
	Between 1 mile and ½ mile	2
Transit Access		**5**
	Within ¼ mile of a transit center or major transfer	5
	Within ¼ mile of a transit stop	3

Category/SubCategory	Criteria	Points
Safety		**10**
Crash Frequency	Tier 1 – Located on a High Injury Corridor Tier 2 – Recent Bike/Pedestrian Collisions (5 years)	5 3
Separation Between Modes (bike)	Class I and IV – Greatest Separation Class III (Bicycle Boulevard only) Class II (Buffered bike lanes) Class II (Bike lanes)	5 3 2 1
Crossing Visibility (Pedestrian)	HAWK or Pedestrian Signal Beaconed crossing High-visibility crossing	5 3 1
Equity		**5**
	Located within a Priority Development Area (PDA) *and* within or adjacent to a Disadvantaged Community or Community of Concern	5
	Located within a PDA	3
	Located within or adjacent to a Disadvantaged Community or Community of Concern *(or facility used by disadvantaged groups)*	2
Funding		**5**
	Potential State/Federal funding source (FHWA/Caltrans)	5
	Potential Regional funding source (STA/MTC)	3
	Potential Local funding source	2
Comfort (Bike facilities)		**5**
	Meets all ages and ability criteria	5
	Doesn't meet all ages and abilities but closes a gap in the existing network	3

Local Weighting of Prioritization Categories

Based upon the prioritization scoring, each jurisdiction identified a custom weight for each prioritization category. These custom weights highlight locally relevant issues and work to minimize categories that are less important for each jurisdiction.

Table 8: Jurisdiction Bicycle Project Prioritization Weightings

Category	Benicia	Dixon	Fairfield	Rio Vista	Suisun City	Vacaville	Vallejo	Unincorporated Solano County
Demand and Key Destinations	12%	10%	7%	10%	15%	5%	-	10%
Connectivity	11%	5%	15%	10%	15%	6%	-	30%
School Access	16%	20%	15%	10%	15%	6%	70%	-
Transit Access	5%	5%	5%	10%	10%	6%	20%	-
Safety – Crash History	12%	10%	10%	10%	20%	6%	-	30%
Safety – Project Type	12%	10%	5%	5%	15%	2%	10%	30%
Equity	8%	10%	12%	5%	5%	2%	-	-
Funding	13%	20%	12%	10%	-	10%	-	-
Comfort	11%	10%	4%	10%	5%	2%	-	-
Local Prioritization Category			15%	20%		55%	-	-

Table 9: Jurisdiction Pedestrian Project Prioritization Weightings

Category	Benicia	Dixon	Fairfield	Rio Vista	Suisun City	Vacaville	Vallejo	Unincorporated Solano County
Demand and Key Destinations	15%	25%	10%	10%	15%	15%	-	35%
School Access	15%	25%	20%	15%	15%	20%	70%	20%
Transit Access	5%	10%	10%	15%	15%	20%	20%	15%
Safety – Crash History	15%	10%	14%	10%	25%	10%	-	10%
Safety – Project Type	20%	10%	15%	10%	20%	5%	10%	10%
Equity	15%	10%	15%	10%	10%	5%	-	10%
Funding	15%	10%	6%	10%	-	10%	-	-
Local Prioritization Category	-	-	10%	20%	-	15%	-	-

Implementation Strategy

The infrastructure recommendations of this Plan will be implemented over time by the various jurisdictions within Solano County. Many on-street projects will be implemented as part of other resurfacing or construction projects. Generally, shared-use paths will be stand-alone projects, sometimes completed in coordination with new development in an area, and sometimes completed over a long period of time in segments as funding is available for these higher-cost facilities. Physical and environmental constraints can also impact the choice of implementation method and influence project phasing.

Implementation Methods

The means by which bicycle and pedestrian infrastructure is implemented vary depending on the facility and project type. This section discusses typical methods by which individual Solano County jurisdictions will grow their active transportation networks. Many pedestrian projects can be implemented as more focused spot treatments and require less analysis of trade-offs than bicycle facilities to implement. The bicycle network recommendations of this plan are suited to the streets where they are located, but specific recommendations as to how each facility should be implemented will be determined by implementing agencies. Further analysis, including parking studies, traffic studies, community engagement, and environmental assessments may be required by local jurisdictions prior to the implementation of any recommendations and may be subject to change based on that analysis.

Resurfacing and Restriping

One of the best opportunities Solano County jurisdictions have for implementing on-street bike facilities is through resurfacing projects. Resurfacing entails paving some or all of an existing street section. In these cases, the addition of bike facilities may be accomplished simply through striping. Restriping also works within the existing street section width, but projects of this type can involve removing and replacing existing roadway striping to reconfigure the street for a bike facility.

Reconfiguring the existing roadway space can take the form of narrowing travel lanes, or reallocating travel lanes or parking lanes to accommodate bike lanes or Class IV separated bikeways. Each individual street will need to be studied at the time of implementation, and a community discussion about reallocation of space may be needed. Class III bicycle boulevard markings, shared lane markings, vertical traffic calming, and bikeable shoulders can also be implemented in conjunction with resurfacing and restriping.

Reconstruction

Street reconstruction projects also provide an opportunity to implement bicycle and pedestrian facilities. Reconstruction projects address a greater depth of the roadway, often fixing more significant maintenance and quality issues than what can be addressed through resurfacing. For bike facility implementation, the key difference is that some reconstruction projects can involve moving curbs to accommodate bike facilities or to implement traffic calming measures such as chicanes, curb extensions, or tighter curb radii. Reallocation of roadway space, as addressed above, and construction of vertical traffic calming elements is also possible with reconstruction projects. Many of the on-street recommendations in this Plan can be implemented without acquisition of additional right-of-way, but where that is required, a project will require reconstruction rather than resurfacing.

In some cases, reconstruction offers the opportunity to reconfigure intersections, so they work better for bicyclists and pedestrians. For example, removal of slip lanes can benefit bicyclists by removing a point of potential conflict with automobiles. Class IV Separated Bikeways and Class I Multi-use Paths can also be implemented in reconstruction projects where the roadway edge is being addressed.

Construction

In this Plan context, “construction” refers to standalone projects. These are Class I multi-use path projects outside the right-of-way, or those that, while in the right-of-way, can be implemented outside the existing street. Construction projects can also include new bridges and underpasses intended for bicyclist and pedestrian travel.

Minor construction may include roadway widening to accommodate bike lanes or shoulders along a roadway. This can occur along the entire length of the facility or at select locations with poor sight lines, where spot widening would provide dedicated space for bicyclists, helping lower the chance of collisions.

Approaches for Specific Facility Types

Bicycle Boulevards (Class III)

Bicycle boulevards are intended to provide a continuous low-speed, low-volume riding experience for bicyclists. Streets in this Plan that are recommended for bike boulevards are, in many cases, already comfortable places to ride a bike for most people. However, where these streets cross major streets without signals or all-way stop signs, additional treatments may be needed to provide a seamless bicycling experience. When implementing bike boulevards, jurisdictions should focus first on these intersections. Without additional accommodation, bicyclists need to wait for a gap in high-volume, higher-speed traffic to cross these streets. Such challenging crossings present a barrier that may keep someone from making a trip by bike. Crossing improvements for bicyclists can take the form of bike crossing warning signage, rectangular rapid flashing beacons, pedestrian hybrid beacons, curb extensions, and median islands.

Offset crossings are also a key issue along bike boulevard routes. In cases where the route jogs along a major street, jurisdictions should note the location of existing traffic control and consider design treatments that allow riders to cross at that location. One technique used in bike boulevard design is a two-way bike facility on one side of the street between the offset streets.

Additional measures to be considered when designing for bike boulevard implementation are:

- Wayfinding to direct riders along local street routes with numerous turns
- Diversion of through traffic at intersections to maintain low traffic volumes

Rural Bike Routes (Class III)

Rural bike routes in this Plan are largely intended for the "Somewhat Confident" and "Highly Confident" rider types. As such, they do not provide a great deal of separation from traffic, but there are a few key implementation approaches that can improve the riding environment, even on high-speed streets.

Jurisdictions should begin improving rural bike routes by identifying locations where sight lines are challenging. These most often occur at the crests of hills or on tight curves. Installation of warning signage indicating bicyclists on the roadway is recommended as a first step toward improving bicyclist safety at these locations. Beyond that, spot widening for bikeable (minimum three-foot) shoulders should be considered in these locations. Many of Solano County's rural roads will have topography challenges at the roadway edge which may limit the ability to widen shoulders.

Where rural bike routes are adjacent to city and town boundaries or they enter or exit more developed areas, such as near Angwin, or, application of shared lane markings should be considered as well. Some of these rural bike routes may also warrant temporary signage during known recreational riding events to alert drivers to the presence of a significant number of bicyclists.

Improving Existing Bike Lanes (Class II)

There are numerous existing bike lanes in Solano County that could be improved with recommended treatments from the Design Toolkit, especially near intersections. When resurfacing streets with existing bike lanes, jurisdictions should consider application of treatments such as appropriate placement of bike lanes with respect to turn lanes, highlighted marking of conflict areas, and continuation of bike lanes through intersections to indicate riders' path of travel.

Project Phasing

All jurisdictions within Solano County have limited funding for implementing the projects recommended in this Plan. In light of this, jurisdictions should keep several implementation approaches and priorities in mind when phasing projects.

Individual projects in this Plan consist of a network recommendation that is defined by the following criteria:

- Within one jurisdiction
- Consisting of one facility type
- Located on one street

Each project may be implemented one at a time, though implementing adjacent bicycle boulevard projects along a single route would be advantageous for bicycle connectivity.

Immediate-Term

These on-street bicycle facility recommendations should be reviewed immediately for potential integration into striping plans.

Short- and Medium-Term

All other planned street resurfacing and reconstruction projects should be reviewed against the recommended bike network and pedestrian project list. Another early step in the implementation of the Plan should be to answer the following questions about each project:

- Does a facility consist only of striping and signage that can be added at any time?
- Does a facility necessitate further community dialog regarding reallocation of street space?
- Does a project need significant funding that must be obtained through a competitive process (i.e., grant)?
- Does a project necessitate acquiring additional right-of-way?
- Are there any environmental concerns about a project location?

These questions can help direct staff to understand which projects are more readily implementable.

Additionally, public input received over the course of this Plan process indicates greater interest in connecting to certain destinations including: schools, parks, trailheads, and community centers. The locations of these destinations, as well as other known bicycle traffic generators such as hotels with bike rental schemes should be considered when selecting projects for earlier implementation.

Long-Term

Some projects, such as many Class I Multi-Use Paths, will necessarily require a more sustained effort to come to fruition. While it may take a longer time to implement these projects, jurisdictions should begin to consider the steps toward construction of these projects so they are prepared for grant applications or inserting funding into capital improvement plans.

Connectivity Improvements from Phased Implementation

The planned bicycle and pedestrian facilities for Solano County are intended to create the most low-stress network that conditions allow. Implementation of sidewalks and on-street facilities such as bike boulevards (Class III) and bike lanes (Class II) will significantly improve the connectivity of the bicycle and pedestrian network for people of all ages and abilities. Focusing first on intersection treatments at locations where these facilities cross high-speed, high-volume streets without a traffic signal will most quickly improve connectivity for both pedestrians and bicyclists.

While multi-use paths (Class I facilities) provide a low-stress riding environment for all types of people walking and bicycling, their implementation requires more investment and often more planning than on-street facilities. The connectivity improvements provided by these higher-cost, higher-effort facilities supplement improvements from on-street facilities, but it is understood that these improvements are more likely to be long-term projects.

Planning-level Project Costs

Below is an estimate of the cost to implement the priority projects listed in this plan. Per-mile planning level cost estimates were applied to bikeway network recommendations only and do not include costs for all intersection crossing treatments or signal modifications. Each recommendation should be further analyzed and vetted by local jurisdictions to determine additional costs associated with each project. These costs are intended to act as order of magnitude planning costs and to assist with potential project scoping as summarized in Table 7. Implementation costs for Class II, Class III, and Class IV facilities will vary depending on the types of materials used (e.g., buffer and posts vs concrete curbs for Class IV Separated Bikeways). For more details on the cost estimates used in the table below and the cost estimate methodology for each per-mile facility cost see *Appendix B: Technical Analysis and Summary Memorandums.*

Table 10: Cost to Implement Bikeway Recommendations

Facility Type	Cost Per Mile	Countywide Project Mileage	Total Countywide Project Cost	Backbone Network Project Mileage	Total Backbone Network Project Cost
Class I Multi-use Path	$1,610,000	135.1	$217,511,000	3.1	$4,991,000
Class II Bicycle Lane	$270,000	44.9	$12,123,000	6.3	$1,701,000
Class II Buffered Bicycle Lane	$310,000	71.7	$22,227,000	13.2	$4,092,000
Class III Bicycle Route	$1,390,000	101.4	$140,946,000	4.8	$6,672,000
Class III Bicycle Boulevard	$220,000	38.5	$8,470,000	1.6	$352,000
Class IV Separated Bikeway	$370,000	61.3	$22,681,000	13.5	$4,995,000
To Be Determined	-	22.9	-	5.7	-
Total	-	475.8	$423,958,000	48.2	$22,803,000

*Costs are rounded to the nearest dollar and reported in 2020 dollars. Class IV Separated Bikeway costs were calculated using the lower per-mile cost with buffers and soft-tip posts. Class II Bicycle Lane and Class II Buffered Bicycle Lane costs were calculated using the higher per-mile cost to account for potential striping modifications.

Pedestrian recommendations costs are provided for sidewalk gap closure projects only (see Table 8). The per-mile cost estimates may not account for all potential ADA-compliance needs but does include spot upgrades to some ADA curb ramps and high visibility crosswalk markings.

Table 11: Cost to Implement Backbone Network Pedestrian Sidewalk Gap Closures

	Sidewalk Gap Miles Along Backbone Network	Cost Per Mile*	Total Cost
Sidewalk Gap Cost	54.4	$990,000	$53,856,000

*Cost includes a 5-foot sidewalk and spot ADA ramp upgrades

Funding Opportunities

Finding funding to support the projects and programs identified in this Plan is an important step towards implementing the Plan and achieving its goals. To assist with this effort, a full list of federal, state, and regional funding sources for active transportation projects is included in *Appendix B: Technical Analysis and Summary Memorandums.* Table 10 summarizes major funding sources and the types of projects funded by each source.

Table 12: Federal, State, Regional, and Local Funding Sources

Agency	Funding Source	ATP Projects Primary (P) or Accessory (A) Focus	Off-street Bicycle Facilities (Class I)	On-street Bicycle Facilities (Class II, III, IV)	Bike Parking	Transit-supportive and Access Improvements	Traffic Calming	Roundabouts	Pedestrian Crossing Enhancements (PHBs, RRFBs, ADA-curb Ramps, etc.)	Low Impact Design and Stormwater Infrastructure	Complete Streets and Corridor Planning Studies	Programs Implementation	Maintenance and Operations
	Federal Programs												
US DOT	Better Utilizing Investments to Leverage Development (BUILD) Grant (Formerly TIGER)	A	✓	✓		✓		✓	✓	✓			
FHWA	Congestion Management & Air Quality (CMAQ)	P	✓	✓	✓	✓	✓	✓	✓	✓		✓	
FHWA	Surface Transportation Block Grant (STBG) Program	P	✓	✓		✓		✓	✓				✓
NPS	Land and Water Conservation Fund (LWCF)	P	✓							✓			
NPS	Rivers, Trails, and Conservation Assistance Program	P	✓							✓		✓	
	State Programs												
Caltrans	Active Transportation Program (ATP) Grant	P	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Caltrans	Sustainable Communities Grant	P									✓		
Caltrans	Strategic Partnerships Grant	P									✓		
Caltrans	Adaptation Planning Grant	P									✓		
Caltrans	State Highway Operation and Protection Program (SHOPP)	A		✓									✓
Caltrans	Highways Safety Improvement Program (HSIP) Grant	P		✓					✓				✓
CTC	Transit and Intercity Rail Capital Program (TIRCP)	A			✓	✓							
CTC	State Transportation Improvement Program (STIP)	A		✓		✓		✓					
CTC	Trade Corridor Enhancement Program (TCEP)	A	✓	✓		✓			✓				
CTC	State-Local Partnership Program (LPP)	P		✓		✓			✓				✓
OTS	Office of Traffic Safety Grants (OTS)	P										✓	
CA Department of Parks and Recreation	Recreational Trails Program (RTP)	P	✓										

Table 12 (continued): Federal, State, Regional, and Local Funding Sources

Agency	Funding Source	ATP Projects Primary (P) or Accessory (A) Focus	Off-street Bicycle Facilities (Class I)	On-street Bicycle Facilities (Class II, III, IV)	Bike Parking	Transit-supportive and Access Improvements	Traffic Calming	Roundabouts	Pedestrian Crossing Enhancements (PHBs, RRFBs, ADA-curb Ramps, etc.)	Low Impact Design and Stormwater Infrastructure	Complete Streets and Corridor Planning Studies	Programs Implementation	Maintenance and Operations
CA Strategic Growth Council	Affordable Housing and Sustainable Communities (AHSC) Program	P	✓	✓	✓	✓	✓	✓	✓	✓		✓	
CA Strategic Growth Council	Transformative Climate Communities (TCC) Program	P	✓	✓	✓	✓	✓	✓	✓	✓	✓		
CA Natural Resources Agency	Environmental Enhancement and Mitigation (EEM) Grant Program	A	✓							✓			
CA Natural Resources Agency	Urban Greening Grant Program	P	✓	✓			✓			✓			
CA Environmental Protection Agency	Environmental Justice (EJ) Small Grants Program	A										✓	
State Water Resources Control Board	Stormwater Management Program	A	✓	✓						✓			
	Regional Programs												
MTC	OBAG	P	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MTC	TDA Article 3	P	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
MTC	Regional Measure 1, 2, 3, and Future Regional Measures	A	✓	✓	✓	✓		✓					
MTC	Regional Active Transportation Program	P	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
MTC	Lifeline Transportation Program (LTP)	P	✓	✓	✓	✓			✓		✓		
BAAQMD	Transportation Fund for Clean Air (TFCA)	P	✓	✓	✓	✓						✓	
BAAQMD	Bicycle Rack Voucher Program	P			✓								
YS-AQMD	Clean Air Funds (CAFs) - Category: Alternative Transportation and or Public Education	P	✓	✓	✓	✓			✓		✓	✓	
	Local Programs												
Local Jurisdictions	Developer Fees/Transportation Impact Fees	Varies per jurisdiction and specific impact fee programs.											

Performance Metrics

STA intends to monitor progress on the implementation of this Plan over time. Performance measures will be used to evaluate how implementation is progressing, whether policies are being established and implemented as planned, and whether plan goals are being achieved. Performance measures are presented in Table 13. Due to varying constraints, some targets may be more difficult to meet or calculate than others and may be dependent on local jurisdiction adoption or implementation of recommendations.

Table 13: Plan Goals, Performance Measures, and Performance Targets

Plan Goal	Performance Measures	Performance Target/Reporting
Access	Number of bicycle and pedestrian projects constructed per year.	Establish a construction pace of one bicycle and one pedestrian capital project per year for smaller jurisdictions and two per year of each for larger jurisdictions
Equity	Number of bicycle and pedestrian projects constructed, and number of programs implemented in Communities of Concern or Disadvantaged Communities per year.	All projects are evaluated for location relative to equity areas, and at least one implemented each year within Solano County.
Health and Safety	Number of reported bicycle and pedestrian collisions.	Reduce the number of reported bicycle and pedestrian collisions by 50% from 2013-2016 average by 2030 and reduce the number of serious injury and fatal bicycle collisions to zero by 2035.
Quality of Life	Number of active transportation encouragement and education programs implemented per year. Number of students reached by the SR2S program.	All K-8 schools within Solano County participate in SR2S programming by 2025.
Environmental Stewardship	Number of vehicle miles traveled reduced through the implementation of active transportation projects and transit connection projects per year.	New development projects contribute to the funding of and construction of active transportation projects that reduce vehicle miles traveled.
Collaboration	Number of BAC, PAC, TAC, and PWDG meetings per year.	Continue to conduct regularly scheduled coordination meetings.
Invest in Our Values	Amount of active transportation funds programmed and awarded per year in Solano.	Increase countywide active transportation funding 15% by 2030.

STA should devote staff time to creating an annual report that provides an update on the measures listed above and on progress toward implementation of Plan infrastructure, policy, and program recommendations. Coordination will be necessary with the various jurisdictions to track several of these measures. This annual report will keep STA and its jurisdiction partners accountable for implementation of these Plan recommendations and continued improvement to the active transportation environment within Solano County.

This page is intentionally left blank.