Bicycle Master Plan

City of Moreno Valley

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Acknowledgements

This Bicycle Master Plan was prepared for the City of Moreno Valley under the guidance of:

Senior Engineer/Project Manager **Michael Lloyd, P.E.**
City Traffic Engineer **Eric Lewis, P.E., T.E.**

Additional input was provided by participants at three community workshops and respondents via the project online survey.

Prepared by **KTU+A Planning + Landscape Architecture**

Principal **Mike Singleton, AICP-CTP, ASLA, LEED AP**
Project Manager/Planner **John Holloway, ASLA, LEED Green Associate, LCI**
Mobility Planners **Joe Punsalan, GISP, PTP, LCI**
Alison Moss

Facility planning and transportation engineering support provided by **IBI Group Inc.**

Associate/Transportation Planner **Bill Delo, AICP**
Transportation Planner **Matt Redmond**

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Importance of Bicycle Planning

Many American cities were built on a foundation of auto-centric infrastructure, programs and policies, but across the nation, many of those same cities are embracing cycling as never before. Some of them are making minor improvements to support cycling, while others are trying to undo the work of decades of planning that privileged the motor vehicle and speed above all else.

Reasons to undertake the significant task of retrofitting American cities to make them bicycle-friendly include environmental, health and economic benefits. The movement to make cycling a viable transportation option is also supported by several recent pieces of California legislation.

Lastly, American cities are embracing cycling in support of becoming places worth visiting and even moving to. Well thought-out bicycle facilities can be an important component of place-making and bicycle friendly cities are increasingly seen as desirable places, places chosen by people who have a choice. To stay competitive, American cities must embrace cycling.

Executive Summary

Background

This bicycle master planning project was funded by a California Department of Transportation (Caltrans) Community Based Transportation Planning (CBTP) Grant. This plan updates Moreno Valley's Bicycle Transportation Plan to conform to Western Riverside Council of Governments' (WRCOG) *Non-motorized Transportation Plan*, as well as other regional plans. In addition, this update identifies deficiencies and opportunities in the existing bicycle facility system within Moreno Valley and in terms of connectivity with adjacent jurisdictions.

Approach and Goals

This bicycle master plan will guide design and implementation of infrastructure, programs and policies as Moreno Valley grows and facilities are planned and sited. The overall approach for this master plan is summarized in the following paragraphs:

It is imperative that a "cyclist's perspective" guide bicycle planning. Their unique characteristics, needs and priorities must be taken into account when making facility, policies or program decisions.

Cycling is a fundamental component of transportation planning, which addresses bicycle facilities on and off streets, as well as modal integration at transit centers and parking facilities.

Planning for cycling should not be focused on any particular facility type so much as it should be focused on the safe and efficient travel of cyclists of all ages and abilities, while addressing pedestrians' needs where shared use is appropriate. This will generally require both the use of the existing transportation infrastructure and the construction of special facilities for cyclists.

The coexistence of cyclists and vehicle drivers on roadways requires that all are sensitive to and recognize a common set of rules. Training, education and enforcement, for both drivers and cyclists, are as important as physical planning and design.

Understanding User Needs

Facility maintenance, monitoring and performance assessment are critical for ensuring safe and efficient travel for cyclists. Planning for them is an ongoing process.

Land use and transportation planning should support projects that reduce automobile dependence. This study acknowledges and supports future land use and population projections with facility and program recommendations to continue to reduce auto reliance.

This bicycle master plan specifically recommends programs and policies designed to make the Moreno Valley a more bicycle friendly place and to encourage more residents to ride rather than drive. Its emphasis on new facilities, programs and policies reflects the fact that Moreno Valley has some bicycle lanes and paths in place, and is likely to achieve increased bicycle usage with the implementation of suggested improvements and initiatives.

This bicycle master plan was developed by planners who routinely commute by bicycle and fully understand the implications of "alternative" travel. For example, potential bicycle routes were ridden to experience them firsthand, particularly routes or locations noted in community comments as forbidding to some users due to high motor vehicle speeds or volumes.

Where residents and visitors choose to go and how they move about Moreno Valley will be influenced by the perceived completeness and safety of bicycle facilities. Improved connections with the overall regional bicycle network will become increasingly valuable as more people choose to commute by bicycle.

Significant Findings

Bicycles can play a significant intra-city travel role since Moreno Valley is large enough to make cycling convenient, but not so large that destinations are beyond a reasonable riding range.

Moreno Valley is also relatively flat, which makes regular cycling feasible for most riders. Along with level terrain, its grid street system and weather support year round cycling. There are also several flood control channels with the potential to provide relatively lengthy off-street routes more appealing to casual cyclists.

While some of Moreno Valley's arterials already have bicycle lanes, some of their posted speed limits and traffic volumes create uncomfortable conditions for many would-be regular cyclists. In addition, within the larger blocks created by the arterial network, many streets do not connect, impeding connectivity and forcing cyclists to go out of their way via these high speed, high volume arterials.

Quality facilities, including clear wayfinding and convenient bicycle parking, can make the difference between riding and not riding. Support programs can also help to encourage bicycle use, such as a centralized web portal where users can access information on bicycle facilities, suggested routes, parking, training, classes and other services to make cycling more convenient.

Linking bicycle improvements with other mobility modes, such as bus and rail service, enhances the effectiveness of all since some intra-city trips and many commuting trips involve more than one mode. Connections with surrounding communities and the overall region are of paramount importance for enabling bicycle circulation as a viable commuter mode. This will require close coordination with Caltrans and WRCOG, Southern California Association of Governments (SCAG), the Riverside County Transportation Commission (RCTC) and the Riverside Transit Agency (RTA) to ensure that planned improvements are implemented in a timely manner and that they connect with Moreno Valley's improvements in a way that will make commuters seriously consider riding instead of driving.

This includes the coming MetroLink extension of RCTC's 91 Line, specifically the Moreno Valley/March Field Station on Alessandro Boulevard immediately west of Interstate 215. Making connections between modes as seamless as possible will do much to encourage residents and visitors to travel via other modes than driving their own vehicle.

Cycling Benefits

Reduced greenhouse gas (GHG) emissions and traffic congestion are community benefits attributable to cycling. Increasing levels of cycling also has positive impacts on local and regional air quality, rider finances and community health.

Environmental Benefits

Although vehicle emissions have been dramatically reduced in recent decades due to regulations and technological improvements, they still impact air quality and human health. Motor vehicles are a significant contributor to air pollution, which can cause asthma, bronchitis, pneumonia and decreased resistance to respiratory infections. Fewer people per capita cycle in the United States than in most other countries and the nation is a leader in petroleum consumption.

In California, 40 percent of carbon dioxide (CO_2) emissions are produced by the transportation sector. While CO_2 is not the most harmful greenhouse gas, it is the most abundant. Even after accounting for the global warming potentials of other greenhouse gases (comparing them in terms of CO_2), 95-99 percent of vehicle emissions are CO_2. The EPA found that the average vehicle emits just under a pound of CO_2 per mile. Therefore, almost 10 pounds of carbon dioxide emissions could be avoided each day if an individual with a five mile (each way) commute switched from driving to an active transportation mode like cycling.

Greenhouse Gas (GHG) Reduction Estimates due to Cycling

Employing the EPA's latest vehicle emissions data, the following table illustrates current estimated GHG reductions (pounds/year) attributable to commuter bicycling in Moreno Valley, and the potential for additional future reductions (approximately 20 percent) resulting from increased commuter bicycling to replace driving due to plan implementation:

GHG Component	Current	Future	Change
• Carbon Dioxide	8,226,179	9,953,337	1,727,158
• Carbon Monoxide	248,186	300,295	52,109
• Hydrocarbons	27,220	32,936	5,716
• Nitrous Oxide	19,014	23,006	3,992
• Inhalable Particles	202	245	43

Economic Benefits

Cycling is a low cost activity that can be easily incorporated into an individual's daily life, such as commuting to work or running errands. In mild climates like Moreno Valley's, cycling can occur year round. Residents can benefit financially from improved cycling infrastructure. Cycling to and from work can save money and people who regularly drive pay higher costs than those who bicycle. Beyond the up-front cost of their vehicle, there is maintenance, insurance and often parking. According to the American Automobile Association, daily driving now costs more than $9,000 annually. Based on an example wage of ten dollars an hour, a vehicle owner must work 900 hours per year to pay for his or her commute by car. By comparison, a cyclist only has to work about 30 hours per year to pay for commuting by bicycle.

Health Benefits

A significant percentage of Americans are overweight or obese, and while the epidemic has shown signs of leveling off, recent projections indicate that 42 percent of the population will be obese by 2030. To combat this trend and prevent a variety of diseases, the Center for Disease Control (CDC) suggests a minimum of 30 minutes of moderate intensity physical activity five days per week, such as cycling. An average adult can ride 6.25 miles in 30 minutes, which burns roughly 130 calories.

Outdoor activities that encourage cycling are great ways to help lose weight since they burn fat, which helps individuals feel and function better. Exercise improves heart and lung fitness, as well as strength and stamina. Regular exercise reduces the risk of high blood pressure, heart attacks and strokes. In addition to heart disease, regular exercise can also help to prevent other health problems such as non-insulin dependent diabetes, osteoarthritis and osteoporosis. Exercise also relieves symptoms of depression, improves mental health, and decreases anxiety and stress levels. Cycling on a regular basis can be a fun way to exercise and takes advantage of its stress-reducing capabilities.

State Compliance

Bicycle master plans in California are specifically intended to encourage bicycle usage as regular transportation and a city's plan must therefore be approved by the Caltrans for the city to be eligible for Bicycle Transportation Account (BTA) funding, administered by Caltrans. Accordingly, this plan addresses the items within the *California Streets and Highways Code Section 891.2*, which lists specific bicycle master plan content requirements needed for Caltrans approval. To facilitate Caltrans review, the specific sections relating to code compliance are compiled in the final appendix as the last page of the document.

Proposed Facilities and Programs

Moreno Valley has some on-street bicycle lanes and off-street paths, as well as some cycling support programs, but this master plan recommends a significant increase in facilities to improve overall connectivity, as well as programs and policies to further encourage bicycle usage as regular transportation.

The range of facilities proposed in this bicycle master plan encompass all three State-designated bikeway classes, as well as recommendations for additional facility types already in use elsewhere, including in California.

The recommended facility types were chosen as the best solutions to address site-specific conditions in locations across Moreno Valley. The majority are bicycle lanes that, wherever possible, take advantage of the City's existing policy of repurposing small amounts of street width to wider bicycle lanes in the normal course of resurfacing maintenance.

Signed bicycle routes are also proposed on narrower, less traveled streets, including enhanced versions called bicycle boulevards, especially where connections can be made with schools and parks. These often parallel busy arterials, allowing users to access their desired destinations, but avoid riding on busy, high speed roadways.

A number of paved multi-use paths are recommended along aqueducts and flood control channels as low-stress routes separated from roadways and vehicular traffic. These bicycle boulevards and multi-use paths are intended to form a functional network of off-street routes more attractive to families and to people who ride less frequently, but may have been considering riding more.

Finally, a number of suggested education and training programs is included to support bicycling because a combination of facilities and support programs has been found to work best to encourage more people to try riding their bicycles, instead of driving their cars, the ultimate goal of this plan.

1 Introduction

The City of Moreno Valley wants to provide a safe, convenient and efficient environment for bicycle travel to and across the City. This bicycle master plan supports this goal by identifying and prioritizing bicycle infrastructure projects, as well as education and training programs intended to improve safety for all roadway users.

This bicycle master planning project was funded by a California Department of Transportation (Caltrans) Community Based Transportation Planning (CBTP) Grant. This plan provides a vision for cycling in Moreno Valley and updates the City's 2006 *Bicycle Transportation Plan* to conform to Western Riverside Council of Governments' (WRCOG) *Non-motorized Transportation Plan*, as well as other regional plans. In addition, this update identifies deficiencies and opportunities in the existing bicycle facility system within Moreno Valley and in terms of connectivity with adjacent jurisdictions.

The study vision is a community where more of its residents and visitors commonly bicycle to get around, instead of automatically reaching for their car keys. Many other communities are pursuing a similar vision, but this study proposes a mobility blueprint tailored for Moreno Valley's unique mix of layout, topography, transportation infrastructure and climate. The expected benefits include physical, social and mental health improvements for those who choose to bicycle, as well as reduced transportation costs and, in some cases, time savings. This will also benefit those who do not bicycle, including reduced traffic and parking congestion, safer streets, improved air quality and reduced green house gas emissions.

The three primary purposes in updating the Moreno Valley Bicycle Transportation Plan are as follows:

1. Bring Moreno Valley's plan into conformance with WRCOG's *Non-motorized Transportation Plan* and other regional plans. The WRCOG plan is a component of the region's efforts to assist the Southern California Association of Governments (SCAG) in addressing regional greenhouse gas reductions as required by SB-375. Other regional plans include the *Compass Blueprint Plan* for the Alessandro Boulevard corridor, as well as adjacent jurisdiction plans.
2. Bring Moreno Valley's bicycle planning up to date with current state of the practice to take advantage of the latest innovations, such as buffered bicycle lanes, bicycle boulevards, enhanced traffic signal detection, bicycle boxes and other ongoing research. This plan identifies the best strategies to integrate cycling with other transportation modes, such as Metrolink, and Amtrak California and RTA bus service.
3. Identify deficiencies within the existing network. Identifying missing links, extensions to residential areas, schools/parks and employment centers/retail centers and required connectivity to regional/adjacent jurisdictions will enable Moreno Valley to improve internal and regional mobility.

This updated plan is anticipated to help increase ridership through facility improvements and recommended programs. Identifying deficiencies would allow Moreno Valley to address potential safety concerns. Enhancing the overall bicycle network should support greater utilization by making cycling a more viable transportation option.

1.1 Scope

This plan is intended to provide a vision for bicycle circulation through understanding current conditions, identifying cyclists' needs throughout the City and examining potential improvement options. The study also addresses opportunities to connect and integrate existing and proposed facilities and to prioritize implementation strategies in accordance with viable funding sources. Since this study provides a framework for the City's bicycle network development, it also supports eligibility for local, State and federal funding for bicycle projects. Adoption of this plan makes Moreno Valley eligible for such funding.

With the implementation of this study's recommendations, the resulting network will create a more bicycle-friendly community, especially if supported by vehicle driver and cyclist education, enforcement and promotional programs and policies. The anticipated result is an increase in residents and visitors choosing to ride a bicycle to and from Moreno Valley destinations. This plan sets the foundation for decisions and identifies a blueprint for future bicycle development so that opportunities are not missed in the course of other infrastructure, land use and facility development decisions. Precise alignments and details will be developed during subsequent implementation phases.

1.2 Study Area

The study area was the City of Moreno Valley in western Riverside County. Also considered were adjacent communities and unincorporated areas where existing and proposed cycling connections offered opportunities for increased regional connectivity. Strengthening regional connections, in addition to being a standard planning goal, is required for State approval of a city's bicycle master plan. Among the regional connections are those with the City of Riverside, University of California-Riverside, the Lake Perris State Recreation Area and the planned Metrolink station immediately west of Moreno Valley.

A local and regional route development goal was to foster low-stress and comfortable facilities to entice more people to consider cycling for everyday trips and recreation. Within Moreno Valley, special consideration was therefore given to increased connectivity to schools, parks, shopping centers and the transit network.

Figure 1: Regional Setting

1.3 Benefits of Cycling

Numerous environmental, health and economic benefits are attributable to cycling, especially as a substitute for driving a vehicle.

Environmental Benefits

Increased cycling reduces fossil fuel emissions. In California, 40 percent of carbon dioxide (CO_2) emissions are produced by the transportation sector. While CO_2 is not the most harmful greenhouse gas, it is the most abundant. Even after accounting for the global warming potentials of other greenhouse gases (comparing them in terms of CO_2), 95 to 99 percent of vehicle emissions are CO_2. The EPA found that the average vehicle emits 0.95 pounds of CO_2 per mile. Therefore, almost 10 pounds of carbon dioxide emissions could be avoided each day if an individual with a five mile (each way) commute switched from driving to an active transportation mode like cycling.

Health Benefits

Despite dramatic strides in recent decades through regulations and technological improvements, vehicle emissions still pose a significant threat to air quality and human health. Vehicle generated air pollution contains harmful greenhouse gas emissions including carbon dioxide, carbon monoxide, methane, nitrous oxide and volatile organic compounds. These pollutants and irritants can cause asthma, bronchitis, pneumonia and decreased resistance to respiratory infections. Taking steps to reduce these emissions is particularly important in the United States, which leads the world in petroleum consumption. The conversion of vehicular trips to cycling trips offers a great opportunity to reduce emissions and improve public health.

In addition to the universal public health benefit, such as improved air quality described above, cycling has the potential to positively impact personal health. A significant percentage of Americans are overweight or obese and recent projections indicate that 42 percent of the population will be obese by 2030. To combat this trend and prevent a variety of diseases and their associated societal costs, the Center for Disease Control (CDC) suggests a minimum of 30 minutes of moderate intensity physical activity five days per week. Not only does cycling qualify as "moderate intensity activity," it can also be seamlessly integrated into daily routine, especially if chosen for utilitarian purposes like commuting or running errands.

Other health benefits associated with moderate activity, such as cycling, include improved strength and stamina through better heart and lung function. Regular exercise reduces the risk of high blood pressure, heart attacks and strokes. In addition to heart disease, regular exercise can also help to prevent other health problems such as non-insulin dependent diabetes, osteoarthritis and osteoporosis. Lastly, exercise has been shown to improve mental health by relieving symptoms of depression, anxiety and stress.

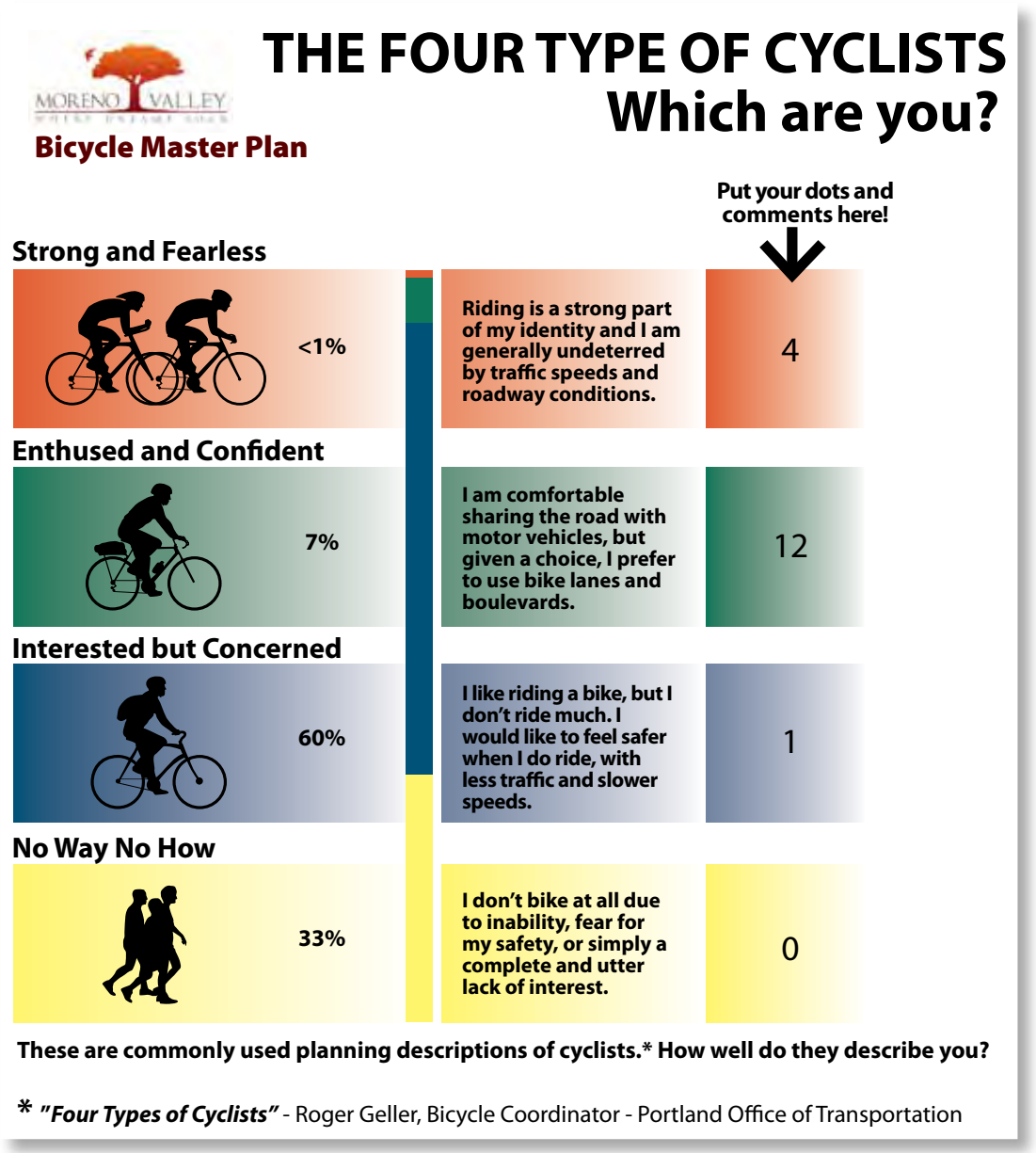
Economic Benefits

Cycling infrastructure and programs has increasingly been shown to deliver economic benefit to both individuals and society at large. The benefits of cycling may, in fact, outweigh its costs. Cycling, and utilitarian cycling in particular, offers somewhat obvious cost savings to individuals. Beyond the up-front cost of operating a vehicle are additional maintenance, insurance and often parking costs. According to the American Automobile Association, the annual cost of owning a car and driving 15,000 miles a year is now just over $9,000.

Converting even a fraction of automobile trips to bicycle trips can create significant transportation-related savings as a result of reduced vehicle traffic congestion. Increased cycling also translates to health-related savings, for both individuals and taxpayers, in the form of less need for preventative care. More cycling has also been tied to increases in commercial and residential property values and retail sales. Shoppers who reach their destination by bicycle have been shown to make smaller purchases, but shop more often and spend more money overall. Shoppers who arrive by bicycle, by virtue of their more limited range, are also more likely to support local businesses, and do not require a vehicle parking spot.

Perhaps more compelling than reducing GHG emissions or combating the obesity epidemic is the benefits cycling has to offer in terms of quality of life. Cycling, and especially utilitarian cycling, is increasingly seen as a fun, low-cost, healthy and sustainable way of getting around. How then, can we make it easier for any person to choose a bicycle for his or her daily trips?

In an effort to re-position cycling as a safe and common mode of transportation and increasing the number of people cycling, attention needs to be shifted away from creating "cyclists" and toward making it easier for any person to chose cycling for their everyday trips. Research shows a strong latent interest in cycling among those who identify as "interested, but concerned." (See public workshop graphic below.) These individuals do not identify themselves as "cyclists," but they do not necessarily need to do so to benefit from programs to encourage cycling. While all segments of the population may be encouraged to ride, it is through the encouragement of this "interested, but concerned" segment of the population that the greatest gains in mode share will be made. The field of bicycle planning is being redefined toward this end.



1.4 Methodology

Project methodology depended on local familiarity through field work and community input, as described in the following sections.

Field Work

Initial field work conducted during the spring and summer of 2013 consisted of driving and then cycling to obtain first-hand experience. Subsequent field work later in the year involved examining specific areas of opportunity identified by the community and through existing conditions analysis. Field work, by car, by bicycle and on foot afforded planners a more accurate picture of existing conditions, and included important observations, such as typical user behavior on and in the vicinity of potential bicycle facilities.

Community Input

Community involvement was instrumental in analyzing existing conditions and formulating plan recommendations. Several techniques were employed to gather as much information and as many perceptions as possible, including the development of a website with an on-line survey, stakeholder outreach, comment maps at bicycle shops, press releases, as well as three community workshops.

The community workshops held during the course of this master plan's development were part of an effort to reach out to unique communities of interest, including cyclists, pedestrians and transit users, as well as an initial workshop held on a weekday afternoon to draw participation from regional transportation agency stakeholders. These workshops offered an opportunity to provide educational materials and outreach to attendees. The planning team included two League Certified Instructors (LCIs) to assist those wanting more information and education regarding safe cycling and Spanish translation was made available at all of the workshops.

Two initial public workshops were held on the same day, one for public officials and one for the rest of the community, to address the development of project vision, goals and objectives. Existing facilities, opportunities and constraints were presented to solicit feedback on improvements needed for these facilities and for developing new ones. High-resolution aerial plots of the entire City were placed on tables on which participants could draw and write comments about their knowledge of the local cycling environment. Public comments on the aerial maps and other project boards were gathered to assist in developing recommendations, identifying potential projects and determining the level of community awareness.

The second public workshop presented the results of the data collection effort and needs assessment. Public comments were solicited regarding issues, concerns and recommendations concerning existing and proposed bicycle facilities. Recommended programs and policies were also presented to gather feedback on what the community would like to see to improve Moreno Valley's cycling environment.

The third workshop was held during the final stage of the planning process to present the recommended projects to the public to ensure that the final plan truly reflected community desires and to solicit any final comments for incorporation into the document. In addition, a map of the recommended facilities was displayed at a local bicycle shop between the second and third workshops with an invitation to comment.

A plan website was maintained through the draft phase of the project, on which meeting products and notices were posted. An online survey on the website, was the site's most important contribution to the project. Such surveys have proven valuable because they allow respondents to compose their thoughts at their leisure, often resulting in more comments overall and with more in-depth insight about specific locations than generally provided at public meetings alone. (A summary of community input is included in Appendix C.)

1.5 Bikeway Facility Types

The State of California recognizes three types of bikeway facilities. Also included in this section is information on other "non-standard" innovative facility types that can be tested by local jurisdictions with Federal Highway Administration (FHWA) and California Traffic Control Device Committee (CTCDC) approval (See "Other Facility Types" on following pages).

Path connecting Eucalyptus Avenue and Towngate Memorial Park

Class 1: Multi-use Paths

Class 1 multi-use paths (frequently referred to as "bicycle paths") are physically separated from motor vehicle routes, with exclusive rights-of-way for non-motorized users like cyclists and pedestrians and with motor vehicle cross flows kept to a minimum. Where there is the potential for motor vehicles to encroach onto a Class 1 facility from a parallel roadway, a barrier should be provided. Any separation of less than five feet from the pavement edge requires a physical barrier.

Class 1 facilities are often important commuter connections and any proposed paths must be designed for multipurpose use. Paths should be wide enough to accommodate multiple user types. Caltrans requirements call for eight feet minimum paved width with two feet of clear space on each side. Adding two feet of additional width to these facilities to make them 10 feet wide helps prevent pavement edge damage from maintenance or patrol vehicles and accommodates higher use volumes. Depending on anticipated use levels, Class 1 facilities can be built even wider.

Finally, unlike on-street facilities that already have defined minimum design speeds, this is a factor to consider for Class 1 facilities. On relatively flat routes, the minimum design speed is 25 mph.

Multi-use path - Coronado, CA

Example protective barriers for Class 1 paths along roadways

Class 2: Bicycle Lanes

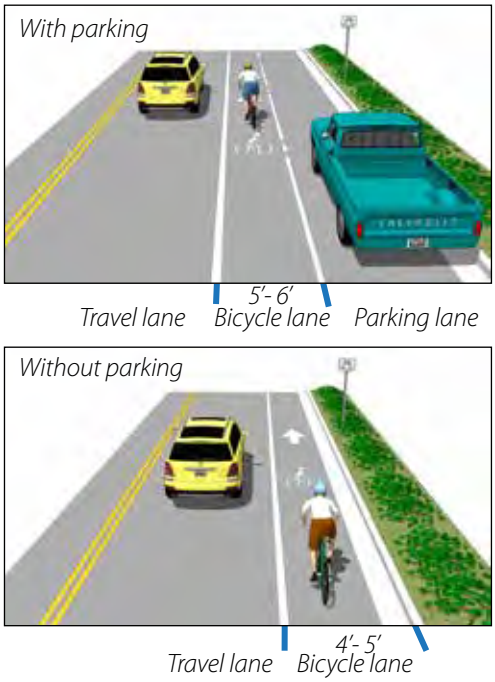
Bicycle lanes provide an exclusive roadway space for cyclists, demarcated through pavement marking and signage. Bicycle lanes must be one-way facilities and carry bicycle traffic in the same direction as the adjacent motor vehicle traffic. They are typically located along the right side of the street, between the adjacent travel lane and curb, road edge or parking lane. This facility type may be located on the left side of one-way streets, or buffered from parked cars or the adjacent travel lane, where space permits. Lastly, contra-flow bicycle lanes may be permitted along one-way streets where two-way bicycle access is desired. Where this occurs, the lane should be marked with a solid, double yellow line and width increased by one foot.

Bicycle lane - Indian Street

Bicycle lanes enable cyclists to ride at their preferred speed, with limited interference from prevailing traffic conditions. These facilities have no barriers or grade separation, which gives cyclists the freedom to leave the facility to avoid debris or overtake a slower cyclist, but offers less protection from moving vehicles and vehicles parking within the lane than other separated facilities. The prohibition of parking within a bicycle lane actually requires regulatory signage and may be further enhanced with colorful lane markings.

Minimum bicycle lane width is four feet where there is no vehicle parking, and five feet where there is parking. Residual width should be striped as a buffer. A buffer on the travel lane side offers greater separation (distance) from moving traffic and is recommended where there is no vehicle parking. Where there is parking, a buffer between the bicycle lane and the parking offers protection from colliding with suddenly opened car doors, known as "dooring." If parking volume is substantial or turnover is high, an additional one or two feet of buffer width is desirable.

Finally, bicycle lane placement and widths have been undergoing substantial change as many planners and advocates have come to agree that the current minimums may be inadequate for some situations. Many municipalities now convert extra travel lane space into wider bicycle lanes and



Buffered bicycle lane - Nason Street

Sign R81 (CA)

associated buffering. Moreno Valley, for example, as streets are resurfaced, has been improving its bicycle lanes on streets without parallel parking by striping them at six feet wide measured from the edge of the gutter pan rather than the accepted standard of measuring five feet from the curb face, which encourages cyclists to ride further away from the seam created by the gutter pan/paving interface. Class 2 bicycle lanes may be up to eight feet wide to allow two cyclists to ride comfortably side-by-side.

Bicycle route - Ironwood Avenue

14'-16' shared travel lane

Sign D11-1

Sign R4-11

Class 3: Bicycle Routes

A Class 3 facility is a suggested bicycle route marked by signs designating a preferred route between destinations. They are recommended where traffic volumes and roadway speeds are fairly low (35 mph or less). The designation of a roadway as a Class 3 facility should be based primarily on the advisability of encouraging bicycle use on that particular roadway. While roadways chosen for Class 3 facilities may not be free of problems, they should offer the best balance of safety and convenience of the available alternatives.

Bicycle route guide signs are provided at decision points along designated bicycle routes, including signs to inform cyclists of bicycle route direction changes and confirmation signs for route direction, distance and destination. These signs are repeated at regular intervals so that cyclists entering from side streets will know they are on a bicycle route.

Shared lane markings (SLMs or "sharrows") are an optional signage method to alert drivers to the expected presence of cyclists, as well as to direct cyclists to the proper roadway riding position to avoid "dooring." They are used where posted speed limits are 35 mph or less, with the exception being where there is no other bicycle facility and the right-most travel lane is too narrow to allow drivers to safely pass cyclists.

Sharrows are placed at least 11 feet from the curb, but may be placed farther out, including in the center of the right lane if it is too narrow to accommodate this minimum. On streets without on-street parking and with a right lane less than 14 feet wide, sharrows must be centered four feet from the curb face or pavement edge and at intervals of no more than 250 feet, including immediately after intersections. Sharrows are commonly combined with "Bicycles May Use Full Lane" (BMUFL) signs. (See applicable section on following page for more information.)

Shared lane marking ("Sharrow" or "SLM")

Other Facility Types

There are a number of other "non-standard" facilities that the City may find useful in specific situations.

According to the Federal Highway Administration (FHWA), any treatment intended to regulate, warn or guide traffic (vehicle drivers and cyclists) that serves more than just an aesthetic purpose is considered a traffic control device and regulated at the federal level by the FHWA and are codified in the *Manual on Uniform Traffic Control Devices* (MUTCD). California also has its own version (CA MUTCD), which is overseen by Caltrans and the California Traffic Control Devices Committee (CTCDC). Both MUTCDs are responsible for defining the standards used to install and maintain traffic control devices on all public and private roads open to public traffic. In California, anything not in the CA MUTCD is considered not approved for use on roadways.

For bikeway facilities not yet included in the CA MUTCD, the City should consult Caltrans for locations within State right-of-way or when utilizing BTA funding. For other locations or funding sources, a FHWA request for experimentation is recommended *(http://mutcd.fhwa.dot.gov/condexper.htm)*.

The CA MUTCD states that traffic control devices must conform to California Vehicle Code (CVC) Section 21401, which requires Caltrans to adopt uniform standards and specifications for traffic control devices. Although Caltrans does not control local traffic control devices (unless they are on State facilities) or enforce compliance with the California MUTCD (except indirectly through funding), any agency that installs a noncompliant device, contrary to the CVC, potentially exposes itself to liability.

However, the CA MUTCD does provide a means for Caltrans and local agencies to experiment with non-approved devices. The agency can request CTCDC approval prior to experimentation, which is defined as "*...research involving testing, evaluating, analyzing or discovering the effect of a specific device, principle, supposition, etc., usually carried out in an operational context*." The CTCDC may either approve the device for limited use on an experimental project, approve the device for limited use in a formal research project, disapprove it until further justification is submitted, or disapprove it altogether.

The CA MUTCD provides specific guidelines for experimental proposals, including a detailed description of the experimentation, locations, number of projects, a proposed plan of study, time periods, CTCDC approved-evaluation criteria and reporting. If the experiment results in a proposed change to the CA MUTCD, recommended text should be included.

All proposals must list the agency sponsoring and conducting the study and the name and titles of principal researchers. There must be proof of professional traffic engineering capabilities and other related professional expertise to perform the experimentation and related evaluation processes.

At the end of the experimental period, all installations must be removed, unless the CTCDC grants an extension or permission for continued operation.

Caltrans policy is that all experimental proposals that involve bicycle-related issues are referred to the California Bicycle Advisory Committee (CBAC) for discussion before consideration by the CTCDC. This procedure is not part of the California MUTCD, and CBAC approval is not a condition for CTCDC approval.

The State of California recently approved what are essentially embellishments to existing facility types, some of which may prove useful in future recommended projects.

Green Transition Lanes

One significant change is the FHWA's interim approval for the use of green colored pavement within bicycle lanes in mixing or transition zones, such as at intersections and in other potential conflict zones where motor vehicles may cross a bicycle lane. They are intended to warn drivers to watch for and to yield to cyclists when they encounter them within the painted area. The FHWA found that both drivers and cyclists have a favorable impression of green colored bicycle lanes. Cyclists felt safer while riding on green bicycle lanes, while drivers felt that green bicycle lanes helped increase their awareness of bicycles in the area. FHWA studies have also shown that green bicycle lanes improve cyclist positioning as they travel across intersections and other conflict areas.

Jurisdictions within the State must notify Caltrans before proceeding with green bicycle lane projects because the agency is required to maintain an inventory, but since Caltrans has requested to participate in this interim approval, the process has been streamlined because FHWA experimental treatment protocol is no longer required.

Green transition lane - Alpine Road at I-280, San Mateo, CA

Green transition lane (Simulation with recommended signage) - College Boulevard at I-8, San Diego, CA

"Bicycles May Use Full Lane" Sign

Another important change is a new sign for use along streets designated as Class 3 routes that notify all users that cyclists are allowed to use travel lanes. These read "Bicycles May Use Full Lane" (BMUFL) and are generally placed in conjunction with Shared Lane Markings ("sharrows" or SLMs). These black and white regulatory signs will generally replace the yellow and black "Share the Road" placard, which were merely advisory. These signs, in conjunction with SLMs, allow cyclists to legally "control the lane" (avoid the "door zone") within what the Uniform Vehicle Code (UVC) defines as a substandard width lane, or a "*lane that is too narrow for a bicycle and a vehicle to travel safely side by side within the same lane.*" According to the MUTCD, a BMUFL sign may be used in addition to or instead of a SLM to inform all road users that cyclists may occupy the travel lane.

"Shared Road" Sign

While the BMUFL sign is commonly accepted and generally conveys the intended message, recent discussion suggests the use of stronger language ("Shared Road") and accompanying education where appropriate. This phrasing is more powerful because it is a statement of fact and implies legal consequence for violators, while "Bikes May Use Full Lane" and "Share the Road" sound more like cautions. Regardless of the exact language, this type of sign should accompany SLMs. Both education and marketing should be provided to explain any signage and roadway markings new to the community.

Cycle Tracks

Cycle tracks are exclusive bicycle facilities that combine the user experience of a separated path with the on-street infrastructure of a conventional bicycle lane. A cycle track is both separated from vehicular traffic and from the sidewalk. While there are many different forms of cycle tracks, they all share separation from vehicular travel lanes, parking lanes and sidewalks. Should parking be permitted along a cycle track route, the cycle track is located on the curb side rather than the travel side so that parked vehicles protect cyclists from traffic. Additionally, this design may reduce "dooring" incidences since many trips are drive-alone and the driver will be exiting on the far side of the parking lane away from the cycle track.

Cycle tracks may be one-way or two-way and may be at street level, sidewalk level or an intermediate level. Depending on grade, different design treatments may be required to demarcate a cycle track from the adjacent sidewalk, travel or parking lanes. The physical separation from the roadway can employ parked vehicles, planting areas, bollards, raised lanes or a combination of these elements. These treatments reduce the risk of conflicts between cyclists, pedestrians and parked vehicles. By providing physical separation from traffic, cycle tracks can offer a higher degree of security and are attractive to a broader spectrum of the public.

Cycle tracks may be installed on urban streets with high vehicular volumes and speeds, but to minimize conflicts, selected streets should have long blocks with few to no driveways or other mid-block vehicles access points. Additional signage, traffic control treatments and pavement markings may be needed to direct cyclists along the cycle track and through intersections. Cyclist safety through intersections must be carefully addressed, especially for two-way cycle tracks.

Cycle track (Signage informs left-turning vehicle drivers that cyclists and pedestrians have priority) - Montreal, Quebec

Cycle Tracks in California?

California law defines "bikeway" to mean all facilities that provide primarily for bicycle travel, and categorizes them into three classes; Class I paths, Class II lanes and Class III routes. Assembly Bill-1193 (Bikeways), signed by Governor Brown in September 2014, designates cycle tracks as Class IV bikeways. This bill also requires Caltrans to establish minimum safety design criteria for each type of bikeway by January 1, 2016. (See Section 1.7 for more details.)

Bicycle Boulevards

Bicycle boulevards provide a convenient, low-stress cycling environment for people of all ages and abilities. Bicycle boulevards are installed on streets with low vehicular volumes and speeds and often parallel higher volume, higher speed arterials as an alternative to them. By intention and design, these routes give travel priority to cyclists and they are usually streets with inherently "low-stress" cycling environments that may also provide additional speed and volume management measures to discourage motor vehicle through traffic while promoting it for cyclists.

Bicycle boulevards give priority to bicycle traffic by discouraging cut-through vehicle traffic while allowing local access. They improve cyclist comfort and safety by assigning right-of-way to the bicycle boulevard at intersections, with traffic controls to help cyclists cross major roadways, and an overall distinctive look to make cyclists more aware of the existence of the bicycle boulevard that also helps alert vehicle drivers that the street is a priority route for cyclists.

Bicycle boulevards further augment their existing low-stress environments with enhancements such as traffic calming, where speeds are higher than desired, and traffic diversion, where volumes are higher than desired. Bicycle boulevards are intended to support relatively light motor vehicle traffic volumes due of the traffic calming devices often installed to slow or divert vehicle drivers to other more appropriate routes. Traffic diversion and calming have impacts not only on vehicular travel, but can also provide preferential corridors for cyclists and pedestrians through semi-permeable design.

Intersections may have physical diverters with bicycle cut-outs that allow cyclists to pass through unimpeded, while allowing vehicle drivers to enter to park or access a property, but without being able to continue. Bollards, raised medians or even miniature parks can be positioned in the roadway to allow for cyclist through traffic while prohibiting it for motor vehicles. Similarly, there are traffic calming devices that slow motor vehicles, but do not significantly affect cyclist speed, including speed humps and speed tables with cut-outs for cyclists, chicanes and traffic circles.

Most bicycle boulevards are not striped, but many employ distinctive pavement markings to help identify them. Bicycle boulevards often have higher road surface standards than other streets, and most encourage riders to use the full lane to support parity between cyclists and vehicle drivers. Signage and pavement markings help to identify the route and provide wayfinding, and bicycle-specific signals and detection provide for safe and convenient crossing where the facility crosses high volume roadways.

Consistent with this practice, most employ distinctive pavement markings such as sharrows or other bicycle symbols, and signage to help identify them. The signage and markings not only convey route information and announce the facility as a bicycle priority corridor, they offer the opportunity for placemaking. For maximum convenience and connectivity, bicycle boulevards tend to work best as a part of a network. If the network is dense enough and includes the cyclist-prioritizing design elements previously described, it provides a viable alternative transportation network.

Finally, because their traffic calming features improve pedestrian safety, as well as encourage cycling, some cities de-emphasize the bicycle specificity of these routes by designating them as "calmed, green or quiet" streets, or "neighborhood byways or parkways."

Bicycle boulevard - San Luis Obispo, CA

Hybrid (Context-sensitive) Facilities

Hybrid facilities blend components of established facility types to optimize facility design given certain specific existing conditions such as topography, limited right-of-way, traffic volumes and speeds.

For example, where there is insufficient roadway width for Class 2 lanes in both directions, but where one direction clearly requires a higher class facility than the other due to grade, a hybrid facility may offer the best solution. This is generally a Class 2 bicycle lane uphill, where the speed differential between cyclists and motorists is greater, and a Class 3 downhill, where the speed differential is often minimal. (While the speed differential is an important factor in determining the acceptability of a Class 3 facility, the overall posted speed limit is of greater importance. Class 3 facilities are generally not recommended on roadways with posted speed limits higher than 35 mph.)

Paved Paths and Wide Walkways

Other paved paths and walkways of varying widths occur primarily in developed parks, and are generally asphalt or concrete up to eight feet wide. While not officially Class 1 facilities, some can be critical connections for current and future bicycle facilities.

Hybrid facility - Class 3 with "Sharrows"/Class 2 lane

Paved path - John F. Kennedy Park

1.6 Bicycle Facility State of Practice

Particularly in the last five years, the state of practice for bicycle facilities in the United States has undergone a significant transformation. Much of this may be attributed to cycling's changing role in the overall transportation system. Once viewed as an "alternative" mode, it is increasingly viewed as a legitimate transportation mode and one that should be actively promoted as a means to achieve air quality targets and provide a more equitable transportation system, among other goals. While connectivity and convenience remain essential bicycle facility quality indicators, recent research indicates that the increased acceptance and practice of daily cycling will require low-stress bicycle facilities. Facility types and specific design interventions intended to encourage ridership among the "interested, but concerned" demographic tend to be those that provide separation from high volume and high speed vehicular traffic. Other measures required to mainstream cycling include seamless bicycle-transit integration, convenient and secure bicycle parking and other end-of-trip facilities that address the "last mile," where many systems fail.

Bicycle facility state of practice is in flux and new and innovative facility details are constantly being refined. The amount of guidance regarding innovative facilities at the local, regional, State and national levels varies. In the case of Californian cities, best practice guidance comes primarily from national organizations such as the American Association of State Highway and Transportation Officials (AASHTO) and the National Association of City Transportation Officials (NACTO), and through the efforts of other cities within California and elsewhere, which have planned, implemented and evaluated such facilities. While bikeway design guidance has traditionally come from the State, especially Caltrans and the California *Manual on Uniform Traffic Control Devices* (CAMUTCD), this agency and this manual currently offer little in the way of support for innovative facilities. Fortunately, Californian cities may apply for experimental designation from the FHWA for projects not in conformance with the CAMUTCD.

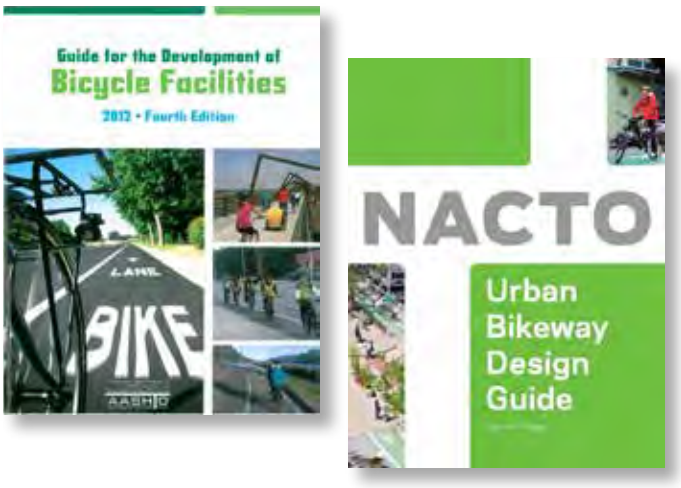
The following section provides a review of the state of practice for bicycle facilities, drawing on the AASHTO and NACTO guides, as well as experiences from California cities and elsewhere. It is followed by a section on the state of practice for Complete Streets at the local, regional, State and national levels.

AASHTO Guide to Bikeway Facilities

This memorandum expresses the Federal Highway Administration's (FHWA) support for taking a flexible approach to bicycle and pedestrian facility design. The AASHTO bicycle and pedestrian design guides are the primary national resources for planning, designing, and operating bicycle and pedestrian facilities. The NACTO *Urban Bikeway Design Guide* and the Institute of Transportation Engineers (ITE) *Designing Urban Walkable Thoroughfares* guide builds upon the flexibilities provided in the AASHTO guides, which can help communities plan and design safe and convenient facilities for pedestrian and cyclists. FHWA supports the use of these resources to further develop non-motorized transportation networks, particularly in urban areas.

NACTO Urban Bikeway Design Guide

The NACTO Guide represents the industry standard for innovative bicycle facilities and treatments in the United States. In April 2014, Caltrans followed AASHTO and officially endorsed the NACTO Guide. It is important to note that virtually all of the design treatments contained (with two exceptions) are permitted under the Federal MUTCD. The NACTO Guide is organized into six sections: Bicycle Lanes, Cycle Tracks, Intersections, Signals, Signing and Marking and Bicycle Boulevards. For each section, it offers three levels of guidance: Required Features, Recommended Features and Optional Features. The following section introduces the broad facility types included in the NACTO Urban Bikeway Design Guide. Further categorization and design details are included in Appendix A: Design Guidelines.

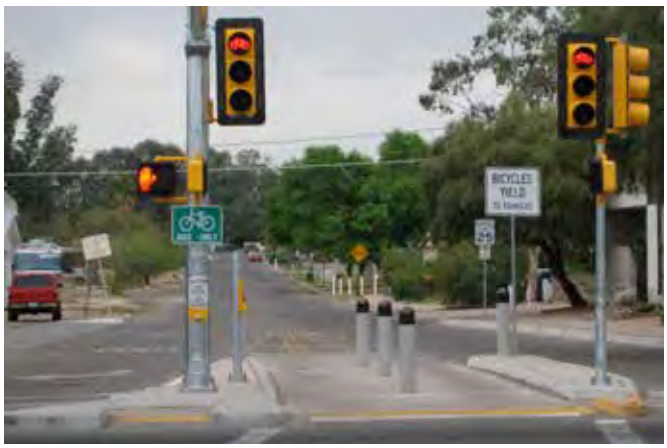


Intersections

Complaints about problematic intersections usually rank high in surveys about existing cycling conditions. Specific problems include the disappearance of facilities at intersections, ambiguous right-of-way, poor visibility, difficult turning movements and inadequate signal timing. The NACTO Guide chapter on intersection treatments offers solutions to increase cyclists' comfort by reducing conflicts between cyclists and vehicles. These solutions achieve these goals by heightening visibility between all modes and by denoting clear right-of-way. Specific designs may employ a combination of color, signage, medians, signal detection and pavement markings. Exact designs require a thorough analysis of existing and anticipated use by all modes, as well as consideration of the bicycle facility type used. For example, the treatment of a cycle track at an intersection will be very different than that of a Class 3 bicycle route.

Signals

Bicycle signals and beacons facilitate cyclist crossings of roadways and are especially important at large intersections with multiple lanes and turning motions. They make such crossings safer by clarifying when to enter an intersection and by restricting turning movements when appropriate. Bicycle signals are traditional three lens signal heads, with green, yellow and red (bicycle symbol) stenciled lenses. They can be employed at standard signalized intersections and at hybrid beacon crossings. They may be enhanced with signage and pavement markings and activated through either push buttons or in-ground sensors. As with intersection treatments, signal design and timing should address existing and anticipated use and should be appropriate given the facility type and overall roadway context.



Bicycle signal heads - Tucson, AZ

Signing and Marking

Appropriate signing and marking should accompany any treatment or infrastructure intended for bicycle use.

Bicycle signage categories include wayfinding and route signage, regulatory signage and warning signage. Wayfinding signage, for example, is particularly important for navigating bicycle boulevards or other Class 3 routes that may meander or connect to other facilities within a network. Another essential use of regulatory signage is to designate the presence of a Class 2 bicycle lane, because such a bicycle lane, even if marked by roadway stencils, may be used for motor vehicle parking if regulatory signage prohibiting it is not provided. Warning signage is also important where bicycle facilities end, change or expose the cyclist to potential hazards, such as freeway interchanges, rail crossings or rough pavement.

Bikeway markings are any device applied to the pavement surface to designate a specific right-of-way, direction, potential conflict area or route option. The choice of material and its application must be carefully considered for both safety and legibility for all roadway users. For durability and long-term visibility, markings must take into account both driver and cyclist movements in relation to the markings.

Complete Streets and Routine Accommodation

An adopted bicycle master plan provides a roadmap to support planning and implementing a bicycle network, can help to integrate bicycle planning into broader planning efforts and is required for State funding of bikeway projects.

For many cities, however, a bicycle plan alone is not enough to ensure the implementation of the plan's goals and projects. A hurdle that many cities face is that their various plans are not well integrated. Despite many cities' attempts to support a "Complete Streets approach," entrenched and often contradictory policies can make implementation difficult. For instance, a bicycle master plan, an ADA transition plan and a specific plan may address the same area, but ignore each other's recommendations. One plan may identify a certain project, but it may not be implementable due to prevailing policies and practices that prioritize vehicular flow and parking over other modes.

1.7 Applicable Legislation

An adopted Complete Streets policy has the potential to address these shortcomings through the designation of some important corridors as Complete Streets, accommodating all roadway users, and other corridors as priority corridors for a certain modes. A system that creates priority corridors for each of the modes, offset from one another, is referred to as a layered network.

Efforts to implement Complete Streets policy often highlight other significant obstacles, chief among them documents defining "significant impacts" to traffic, acceptable vehicular "Level of Service" thresholds and parking requirements. Drafting a Complete Streets policy often means identifying roadblocks like these and ultimately mandating increased flexibility to allow for the creation of a more balanced transportation system. In the case of a bicycle master plan, the network identified could become the bicycle layer. Identification in such a plan, reiteration within a Complete Streets policy framework and exemption from traditional traffic analyses can make implementation of the network more likely and much more affordable.

Legislative support for Complete Streets can be found at the State level (AB-1358) and is currently being developed at the national level (HR-2468). SCAG has announced it will develop a Regional Complete Streets Plan in FY 2014-2015. As explained in further detail in the following section on applicable legislation, AB-1358 requires cities and counties to incorporate Complete Streets in their general plan updates and directs the State Office of Planning Research (OPR) to include Complete Streets principles in its update of guidelines for general plan circulation elements.

Examples of best practices in Complete Streets Policies from around the United States can be found at: *http://www.smartgrowthamerica.org/complete-streets-2013-analysis*.

Several pieces of legislation support increased cycling in the State of California. Much of the legislation concerns greenhouse gas (GHG) reduction and employs cycling as a means to achieve GHG reduction targets. Other legislation highlights the intrinsic worth of cycling and treats the safe and convenient accommodation of cyclists as a matter of equity. The most relevant legislative acts for bicycle policy, planning, infrastructure and programs are described below.

State Legislation and Policies

AB-32 Global Warming Solutions Act

AB-32 calls for the reduction of greenhouse gas emissions and codifies the 2020 emissions reduction goal. This act also directs the California Air Resources Board to develop specific early actions to reduce greenhouse gases while also preparing a scoping plan to identify how best to reach the 2020 limit.

SB-375 Redesigning Communities to Reduce Greenhouse Gases

This bill seeks to reduce vehicle miles traveled through land use and planning incentives. Key provisions require the larger regional transportation planning agencies to develop more sophisticated transportation planning models, and to use them for the purpose of creating "preferred growth scenarios" in their regional plans that limit greenhouse gas emissions. The bill also provides incentives for local governments to incorporate these preferred growth scenarios into the transportation elements of their general land use plans.

AB-1358 Complete Streets Act

AB-1358 requires the legislative body of a city or county, upon revision of the circulation element of their general plan, to identify how the jurisdiction will provide for the routine accommodation of all users of the roadway including motorists, pedestrians, cyclists, individuals with disabilities, seniors and users of public transportation. The bill also directs the OPR to amend guidelines for the development of general plan circulation elements so that the building and operation of local transportation facilities safely and conveniently accommodate everyone, regardless of their mode of travel.

AB-1581 Bicycle and Motorcycle Traffic Signal Actuation

This bill defines a traffic control device as a traffic-actuated signal that displays one or more of its indications in response to the presence of traffic detected by mechanical, visual, electrical or other means. Upon the first placement or replacement of a traffic-actuated signal, the signal would have to be installed and maintained, to the extent feasible and in conformance with professional engineering practices, so as to detect lawful bicycle or motorcycle traffic on the roadway. Caltrans has adopted standards for implementing the legislation.

AB-1371 Passing Distance/Three Feet for Safety Act

This statute, widely referred to as the "3 Foot Passing Law," requires drivers to provide at least three feet of clearance when overtaking cyclists. If traffic or roadway conditions prevent drivers from giving cyclists three feet of clearance, they must "*slow to a speed that is reasonable and prudent*" and wait until they reach a point where passing can occur without endangering the cyclist. Violations are punishable by a $35 base fine, but drivers who collide with cyclists and injure them in violation of the law will be subject to a $220 fine. The law is slated to take effect September 14, 2014.

SB-743 CEQA Reform

Just as important as the aforementioned pieces of legislation that support increases in cycling infrastructure and accommodation is one that promises to remove a longstanding roadblock to cycling infrastructure and accommodation. That roadblock is vehicular Level of Service (LOS) and the legislation with the potential to remove it is SB-743.

For decades, vehicular congestion has been interpreted as an environmental impact and has often stymied bicycle projects. Projections of degraded Level of Service have, at a minimum, driven up project costs and, at a maximum, precluded projects altogether. SB-743 could completely remove LOS as a measure of car traffic congestion that must be used to analyze environmental impacts under the California Environmental Quality Act (CEQA).

This is extremely important because adequately accommodating cyclists, particularly in built-out environments, often requires reallocation of right-of-way and the potential for increased vehicular congestion. The reframing of Level of Service as a matter of motorist inconvenience, rather than an environmental impact, will allow planners to assess the true impacts of transportation projects and will help support cycling projects that improve mobility for all roadway users.

AB-1193 Bikeways

This act amends various code sections, all relating to bikeways in general, specifically by recognizing a fourth class of bicycle facility, cycle tracks. However, the following may be even more significant to future bikeway development:

Existing law requires Caltrans, in cooperation with county and city governments, to establish minimum safety design criteria for the planning and construction of bikeways, and requires the department to establish uniform specifications and symbols regarding bicycle travel and traffic related matters. Existing law also requires all city, county, regional and other local agencies responsible for the development or operation of bikeways or roadways to utilize all of those minimum safety design criteria and uniform specifications and symbols.

This bill revises these provisions to require Caltrans to establish minimum safety design criteria for each type of bikeway by January 1, 2016, and also authorizes local agencies to utilize different minimum safety criteria if adopted by resolution at a public meeting.

Caltrans' Deputy Directive 64-R1

Deputy Directive 64-R1 is a policy statement affecting Caltrans mobility planning and projects requiring the agency to:

> *"...provide for the needs of travelers of all ages and abilities in all planning, programming, design, construction, operations, and maintenance activities and products on the State highway system. The Department views all transportation improvements as opportunities to improve safety, access, and mobility for all travelers in California and recognizes bicycle, pedestrian, and transit modes as integral elements of the transportation system."*

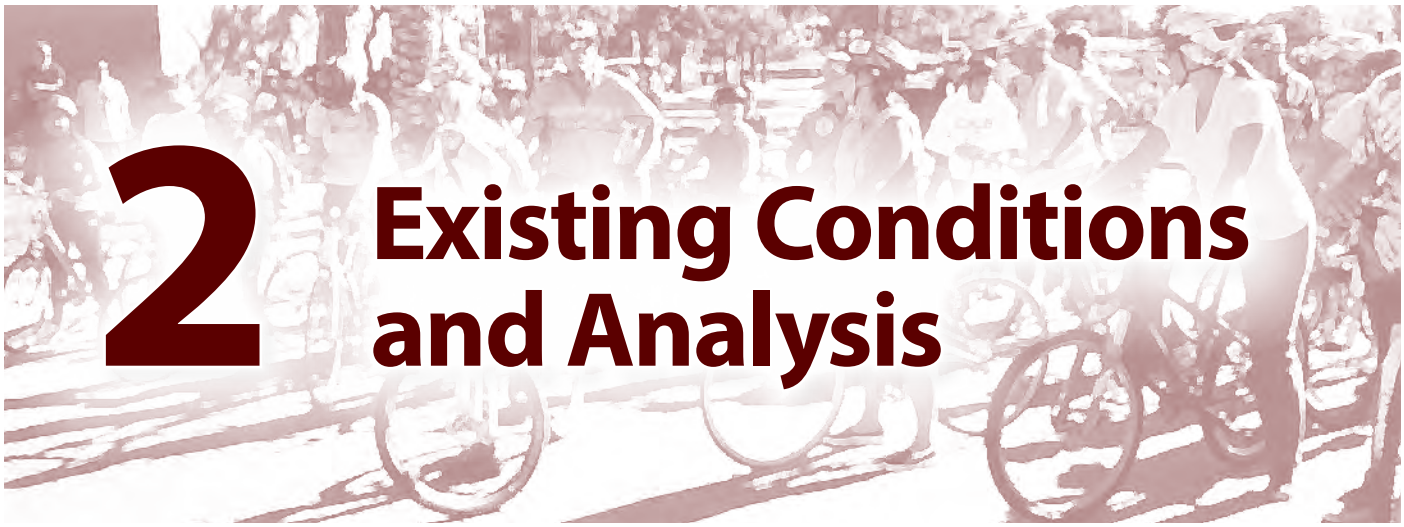
The directive goes on to mention the environmental, health and economic benefits of more Complete Streets.

Federal Legislation

Safe Streets Act (S-2004/HR-2468)

HR2468 encourages safer streets through policy adoption at the state and regional levels, mirroring an approach already being used in many local jurisdictions, regional agencies and states governments. The bill calls upon all states and metropolitan planning organizations (MPOs) to adopt Safe Streets policies for federally funded construction and roadway improvement projects within two years. Federal legislation will ensure consistency and flexibility in road-building processes and standards at all levels of governance.

1 Introduction



2 Existing Conditions and Analysis

2.1 Existing Plans

This bicycle master plan finds ample support for its facilities and program recommendations in existing adopted plans. The following goals, policies, objectives, programs and facilities establish the framework City staff and decision makers will use to enhance and improve cycling in Moreno Valley. The plans and excerpts included are those most relevant to the bicycle master plan.

City of Moreno Valley General Plan

The General Plan's goals are to achieve a community which:

V. Provides recreational amenities, recreation services and open space, including, but not limited to, parks, multi-use trails, community centers and open space.

VI. Enjoys a circulation system that fosters traffic safety and the efficient movement of motor vehicles, bicycles and pedestrians.

VII. Emphasizes public health and safety, including, but not limited to, police, fire, emergency and animal services and protection from floods and other hazards.

V3. Recognizes the need to conserve natural resources while accommodating growth and development.

Community Development Element

The Community Development Element of the General Plan sets forth the goal of fostering:

> *"...an organized, well-designed, high quality and functional balance of urban and rural land uses that will meet the needs of a diverse population, and promote the optimum degree of health, safety well-being and beauty for all areas of the community, while maintaining a sound economic base."*

To accomplish this balance of urban and rural lands, the plan calls for the provision of:

> *"...adequate land for present and future urban and economic, while retaining the significant natural features and the rural character and lifestyle of the northeastern portion of the community."*

The Community Development Element also states that the City shall:

> *"...discourage costly 'leap-frog' development patterns by encouraging in-fill development wherever feasible, thereby reducing overall housing costs."*

Parks, Recreation and Open Space Element Goals, Objectives, Policies and Programs

Goal 4.2

To retain an open space system that will conserve natural resources, preserve scenic beauty, promote a healthful atmosphere, provide space for outdoor recreation, and protect the public safety.

Objective 4.2

Provide safe, affordable and accessible recreation facilities and programs to meet the current and future needs of Moreno Valley's various age and interest groups and promote the provision of private recreational facilities.

Policies:

4.2.1 Neighborhood parks shall serve as the day-to-day recreational areas of the City; Neighborhood parks should be within a reasonable walking distance of the population served. Community parks may also serve day-to-day recreation needs. That portion of the community and/or regional facilities that provide similar amenities to those found in neighborhood parks shall also be considered as meeting this objective.

4.2.5 Work in conjunction with private and public school districts and other public agencies to facilitate the public use of school grounds and facilities for recreational activities. The City shall also encourage the development of park sites adjacent to school facilities to maximize recreational opportunities in Moreno Valley.

4.2.13 Provide recreation programs and access to facilities at reasonable costs.

4.2.14 Establish linear parks in agreement with public and private utilities, including the State of California along the California Aqueduct, for the use and maintenance of utility corridors and rights-of-way for recreational purposes.

4.2.15 Work closely with Riverside County Parks Department in its open space program to ensure that trail systems within Moreno Valley effectively link open space components.

Objective 4.3

Develop a hierarchical system of trails which contribute to environmental quality and energy conservation by providing alternatives to motorized vehicular travel and opportunities for recreational equestrian riding, bicycle riding, and hiking, and that connects with major regional trail systems.

Policies:

4.3.1 The City's network of multiuse trails, including regional trails, community trails, and local feeder trails, shall (1) be integrated with recreational, residential and commercial areas, schools and equestrian centers; (2) provide access to community resources and facilities, and (3) connect urban populations with passage to hillsides, ridgelines, and other scenic areas.

4.3.2 The City shall establish an agreement with public and private utilities for the use and maintenance of utility corridors and rights-of-way for trail purposes.

4.3.8 The City should facilitate the development of a multiuse regional trail system.

4.3.14 Where feasible, use drainage courses, utility rights-of-way and other such opportunities to incorporate trail and open space elements in the design of major development projects.

4-10 Prepare a comprehensive plan of trails that clearly defines the routing of city trails and is part of the General Plan.

Circulation Element Goals, Objectives, Policies and Programs

Goal 5.2

Maintain safe and adequate pedestrian, bicycle, and public transportation systems to provide alternatives to single occupant vehicular travel and to support planned land uses.

Policy 5.3.5 Transportation Demand Management

The region cannot build its way out of congestion; it has neither the financial resources nor the willingness to bear the environmental impacts of such a strategy.

Objective 5.10

Encourage bicycling as an alternative to single occupant vehicle travel for the purpose of reducing fuel consumption, traffic congestion, and air pollution. *(The Moreno Bikeway Plan is shown in Figure 9-4.)*

Policies:

5.10.1 Bikeways shall link residential neighborhood areas with parks, employment centers, civic and commercial areas, and schools.

5.10.2 Integrate bikeways, consistent with the Bikeway Plan, with the circulation system and maintain Class 2 and 3 bikeways as part of the City's street system.

5.10.3 Support bicycle safety programs, and active enforcement of laws relating to the safe operation of bicycles on City streets.

5.10.4 Link local bikeways with existing and planned regional bikeways.

Objective 5.12

Promote efficient circulation planning for all school sites that will maximize pedestrian safety, and minimize traffic congestion and neighborhood impacts.

Policy:

5.12.1 Coordinate with school districts to identify suggested pedestrian routes within existing and new subdivisions for school children to walk to and from schools and/or bus stops.

Programs:

5-10 Support regional projects that improve access to Moreno Valley.

5-11 Work with RCTC, Caltrans, County of Riverside, adjacent jurisdictions and other affected agencies to plan and develop a multi-modal transportation system.

5-12 Coordinate with Caltrans to redesign and reconstruct the SR-60 interchanges with Day Street, Perris Boulevard, Nason Street, Moreno Beach Drive, Redlands Boulevard, Theodore Street and Gilman Springs Road.

5-13 Implement Transportation Demand Management (TDM) strategies that reduce congestion in the peak travel hours.

5-16 Implement programs that mitigate on-street hazards for bicyclists.

5-17 Pursue regional, State and federal grant opportunities to fund design and construction of the City bikeway system.

5-18 Pursue grant funding that supports traffic safety at and in the vicinity of school facilities.

5-19 Work with school districts and private schools to identify school site locations and designs that will minimize traffic impacts and promote traffic safety.

5-21 Work with school districts and private schools to develop and promote traffic safety education programs.

Objective 6.6

Promote land use patterns that reduce daily automotive trips and reduce trip distance for work, shopping, school, and recreation.

Policies:

6.6.1 Provide sites for new neighborhood commercial facilities within close proximity to the residential areas they serve.

6.6.2 Provide multi-family residential development sites in close proximity to neighborhood commercial centers in order to encourage pedestrian instead of vehicular travel.

6.6.3 Locate neighborhood parks in close proximity to the appropriate concentration of residents in order to encourage pedestrian and bicycle travel to local recreation areas.

Objective 7.5

Encourage efficient use of energy resources.

Policies:

7.5.2 Encourage energy efficient modes of transportation and fixed facilities, including transit, bicycle, equestrian, and pedestrian transportation.

Bicycle Transportation Plan

The 2006 plan does not overtly state goals, policies and objectives, but does demonstrate implicit support for bicycle programs in Moreno Valley. It begins with a reference to Section 890 of *California Streets and Highway Code*:

> *"It is the intent of the Legislature, in enacting this article, to establish a bicycle transportation system. It is the further intent of the Legislature that this transportation system shall be designed and developed to achieve the functional commuting needs of the employee, student; business person, and shopper as the foremost consideration in route selection, to have the physical safety of the bicyclist and bicyclist's property as a major planning component, and to have the capacity to accommodate bicyclists of all ages and skills."*

It also states that the main purpose of the plan to ensure eligibility for State funding:

> *"The State has provided a funding program to help implement the bicycle transportation system called for by the above legislation. The program is called "AB1020" for the assembly bill in which it was passed. The AB1020 fund pays a maximum of 90 percent of the cost of an eligible project and each jurisdiction is eligible to receive up to 25 percent of the funds available for any given year. To be eligible to apply for the fund, a jurisdiction must have an approved regionally consistent, Bicycle Transportation Plan. This is the City of Moreno Valley's Bicycle Transportation Plan."*

Bicycle Mode Share: Though not stated as a goal, the plan states that "*upon completion of the bikeway system and build-out of the General Plan, staff estimates that there will be approximately 13,000 daily bicycle commute trips in Moreno Valley,*" based on projections from 1998 commute data. The General Plan's Community Development – Land Use Element estimates that by build-out, Moreno Valley's population will have increased to more than 304,000, roughly a 52 percent increase. The current mode share (0.12 percent, which considers only commuters) was calculated from the following Moreno Valley census data:

Total commuters: 37,355

Estimate of cycling commuters: 45

Margin of Error: 38

Considering a consistent commute rate and the projected commute share 6,500 (half of 13,000 trips), the plan estimates a projected commute mode share of approximately 11.45 percent.

	Current	"At Build Out" *(Projected)*
• Number of Bicycle Commuters	45	6,500
• Commute Share	37,355	56,780
• Total Population	200,000	304,000
• Bicycle Commute Mode Share	0.12%	11.45%

The City's 2006 *Bicycle Transportation Plan* also states several objectives related to bicycle programming. It calls for the shared use of "Safe Moves City" in Van Nuys, a training facility for bicycle/pedestrian knowledge and skills. It also directs the school district to incorporate bicycle and pedestrian safety into its curricula and law enforcement to provide bicycle training, including bike rodeos and helmet giveaways. These policies are aligned with this plan's program recommendations. (See Chapter 3: Recommendations.)

Non-Motorized Transportation Plan, Western Riverside Council of Governments (WRCOG)

WRCOG's *Non-Motorized Transportation Plan* calls for the agency to support local jurisdictions in updating their General Plans to ensure compliance with AB-1358, California's Complete Streets Act. More concretely, it states that such updates must:

> *"...address the provision of a balanced, multimodal transportation network that meets the demand of all users (including pedestrians, bicyclists, children, seniors, and public transit riders) in a manner that is tied to the context (rural, urban, and suburban)."*

The *Non-Motorized Transportation Plan* emphasizes connections of regional significance and lends support for implementing a "*sub regional back bone*" by 2035. It does so through policies to maximize opportunities to fund bicycle and pedestrian improvements and by encouraging local jurisdictions to use their Measure A Local Streets and Road Funds for bicycle and pedestrian improvements.

All jurisdictions in western Riverside County have plans and policies in place for development of a system of routes for bicycling and walking throughout their communities. The *Sub-Regional Non-Motorized Transportation Plan* is intended to provide a framework for key routes and facilities that will ensure connections between communities, major transportation facilities, and nodes of activity. Several WRCOG routes of regional significance go through the City of Moreno Valley, specifically Alessandro Boulevard, Davis Road, Eucalyptus Avenue, Graham Street, Heacock Street, Iris Avenue, Ironwood Avenue, Lasselle Street, Moreno Beach Drive, Redlands Boulevard and Theodore Street.

March JPA - Lifecare Campus Specific Plan No. 7

This specific plan represents a comprehensive approach to the planning and development of a sustainable and integrated health care campus on approximately 236 acres within a portion of the former March Air Force Base now under the jurisdiction of the March Joint Powers Authority (JPA). The plan provides text and exhibits describing the proposed campus, including guidance on land use, urban design, multimodal circulation and parking. The plan calls for providing for the convenient and safe movement of private and transit vehicles, pedestrians and cyclists within the campus.

This includes a bicycle circulation element, predicated on accommodating a diversity of users, and a bicycle circulation system based on a two-tiered approach. Experienced cyclists and bicycle commuters may share the travel lane with slow moving vehicular traffic on internal streets.

North of Meyer Drive where a higher volume of traffic is anticipated, a multi-use trail provides an off-street loop for recreational cyclists and those less comfortable riding on the street. Class 1 off-street paths will be provided on the north side of Meyer Drive, east side of March LifeCare Drive, and the west sides of 'CC' Drive and 6th Street. These will connect to Moreno Valley's proposed trails on the south side of Cactus Avenue and on the west side of Heacock Street.

Bicycle Master Plan, City of Riverside

This plan's objectives and policies were developed from existing bicycle-related objectives and policies contained in the Riverside General Plan 2025 and reflect public input. The goals, objectives and policies cover bicycle facility development, bicycle education and encouragement, system maintenance and regional connections.

Relevant existing and planned bicycle facilities in the City of Riverside include those that make direct connections and those adjacent to Moreno Valley including Alessandro, Sycamore Canyon and Van Buren Boulevards, Eucalyptus and Central Avenues, Meridian Parkway, Box Springs Road and Watkins Drive.

City of Perris Trail Master Plan

This plan was developed to implement the City's General Plan goals, in particular, Goal IV in the Circulation Element:

> *"Safe and convenient pedestrian access and non-motorized facilities between residential neighborhoods, parks, open space and schools that service those neighborhoods."*

In support of this goal, the plan established objectives, policies and actions.

Relevant existing and planned bicycle facilities in Perris include those that make direct connections and those adjacent to Moreno Valley, such as Evans Road, N. Perris and Harley Knox Boulevards, Redlands, Patterson, Webster and Indian Avenues, Markham and Rider Streets, and Lake Perris Drive. Other relevant planned facilities include flood control paths just west of Lasselle Street, just north of Harley Knox Boulevard and adjacent to Lake Perris Drive.

Alessandro Boulevard Corridor Vision Plan

This plan provides a blueprint for a mixed use, mixed income, multi-modal corridor, with special emphasis on activity nodes. It states that streets are multi-modal and that the corridor is designed for both efficient traffic flow and pedestrian and commercial activity. The study area included the Alessandro corridor and the properties within a half mile between the Interstate 215 and Nason Street. The plan vision is as follows:

> *"Alessandro Boulevard is a thriving multi-modal boulevard that connects neighborhoods and employment centers with regional, community and neighborhood-serving retail and services spaced along the corridor in activity nodes. Residents, employees and visitors can walk to the corridor for a variety of needs ranging from personal services to restaurants and groceries."*

2.2 Existing Facilities and Programs

Roadway System

Moreno Valley's roadway system is primarily an arterial grid defining "superblocks" of residential streets that rarely connect across the surrounding arterials. Instead, these residential streets often form loops or terminate as cul-de-sacs. In addition, State Highway 60 cuts east-west through the northern portion of Moreno Valley with crossing points limited to a few north-south arterials. Interstate 215 runs along a portion of the western City limit.

Existing Bikeway Facilities

There are substantial east-west Class 3 bicycle route segments and Class 2 bicycle lanes on some arterials, as well as some segments of Class 1 multi-use paths along flood channels. Buffered bicycle lanes have been installed on a portion of Nason Street and the City has been upgrading its lanes when resurfacing streets. Instead of measuring five feet from the curb face, newly repainted lanes are six feet wide measured from the edge of the gutter pan, with the additional width converted from adjacent vehicle travel lanes. Even so, the existing system provides limited connectivity since the facilities are relatively piecemeal (See Figure 2).

Bicycle Programs

A Safe Routes to School (SRTS) program is in place at seven elementary and three middle schools in Moreno Valley. The program consists of walking school buses, parent and community volunteers posted along walking paths and volunteer crossing guards. The City also provides suggested route maps online for all elementary schools. According to the school district website, this program has encouraged almost 9,000 students and their parents to walk or bicycle to school.

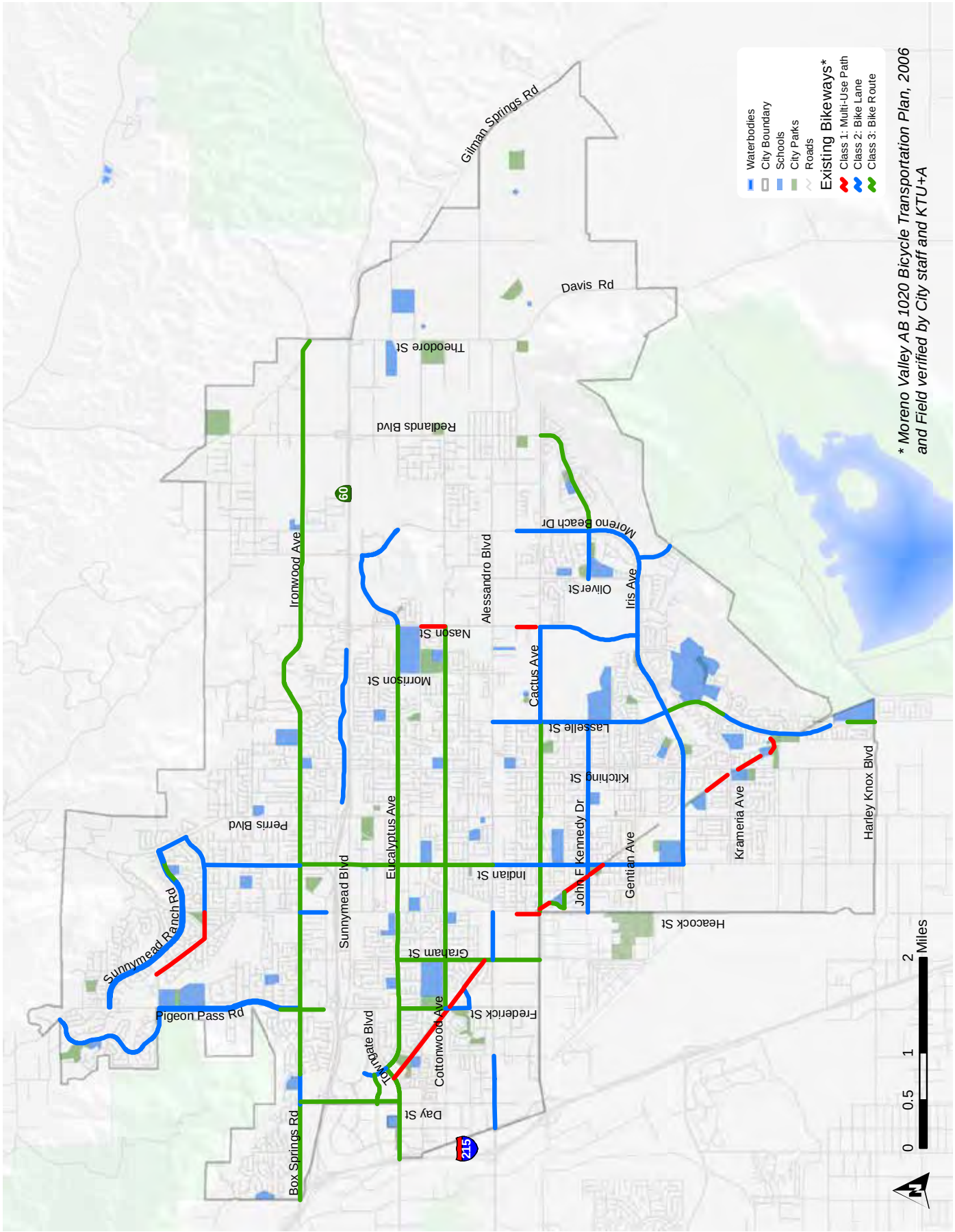
The City of Moreno Valley provides flexible work schedules, as well as Inland Empire Commuter Incentives through the Riverside County Transportation Commission (RCTC) to reward those switching from single occupancy vehicle trips to other modes, such as bicycling.

Finally, the City and the Inland Empire Biking Alliance's (IEBA) inaugural "Ride MoVal" event in the fall of 2013 consisted of four routes, ranging in distance from five miles to a metric century (62 miles), with proceeds going to Moreno Valley Unified School District sports programs. Organizers plan to make this an annual event along with a possible cyclocross race series. The IEBA also recently initiated a Bicycle Ambassador program.

Regional Bikeways

WRCOG maintains a regional bikeway system plan that includes routes within Moreno Valley and connections between it and the surrounding communities and unincorporated areas of Riverside County. Within Moreno Valley, designated WRCOG routes include Davis Road, Alessandro Boulevard, Iris Avenue, Moreno Beach Drive, and segments of Heacock, Graham and Lassalle Streets, Ironwood and Eucalyptus Avenues and Redlands Boulevard.

Figure 2: Existing Bicycle Facilities



2.3 Trip Origins and Destinations

California Streets and Highways (S&H) Code Section 891.2 specifies the required components of a city's bicycle transportation plan that make it eligible for the Caltrans approval needed before the city may apply for federal grant funding for bikeway projects. Among the required items is:

> *"(b) A map and description of existing and proposed land use and settlement patterns which shall include, but not be limited to, locations of residential neighborhoods, schools, shopping centers, public buildings, and major employment centers."*

These components are described further in the following paragraphs and accompanying maps on the following pages.

Land Use

Moreno Valley's land use follows a typical pattern, with most office, commercial and retail functions focused along major arterial corridors and freeways. Single family residential development occupies the bulk of the superblocks between the arterials, but this is interspersed with substantial multi-family zoning. In general, residential density is lower in the eastern reaches of the City compared to the western, where there are significant areas zoned for 15 and 20 dwelling units per acre. There is also a swath of medium density residential zoning of primarily 10 units per acre along the southern City boundary adjacent to open space bordering Lake Perris State Recreation Area (See Figure 3).

There are large swaths of business park/light industrial zoning immediately north and east of March Air Reserve Base in the southwest portion of the City, as well as along the eastern City limit and adjacent to SR-60 on the south side of the freeway. There is also a substantial amount of office zoning immediately north of the freeway in this area.

Open space is concentrated around the outskirts of the City, with the largest area bordering Lake Perris State Recreation Area to the south, as well as an area to the northeast. Other open space areas are scattered across the City, including one in close proximity to Riverside County's Box Springs Mountain Park to the northwest. Parks are distributed across the City.

Planned land use is not expected to change in the near future, but it should be noted that in an eastern portion of Moreno Valley zoned for business park/light industrial uses, a distribution complex is being planned that will occupy an area large enough to drive localized street reconfiguration.

Population and Employment Density

Moreno Valley's relatively low overall population density reflects its largest land use of single family residential distributed fairly evenly across the City. However, the western half has higher density than the eastern half and contains substantial multi-block areas with densities exceeding 15 persons per acre (See Figures 4 and 5).

Employment density is more variable, but concentrated within the western half of the City, particularly between March Air Reserve Base and State Route 60. There are a few small employment pockets scattered across the eastern half of the City, but these are very limited compared to the concentrations within the western half.

Activity Centers

The California Streets and Highways Code Section 891.2 requirement to account for *"…schools, shopping centers, public buildings…"* is addressed in most plans as "activity centers," since these are all entities that currently or could potentially draw and supply bikeway system users.

Activity centers are defined as a community's major employers, office buildings, industrial sites, government sites, retail centers, hospitals, major attractions, colleges, universities, schools or parks and open space. The commercial and retail activity centers can also be regarded as employment centers because, in addition to the customers that constitute typical activity center users, they also represent significant numbers of employees. The civic activity centers include Moreno Valley's parks and schools (See Figure 6).

These centers particularly define trip origins and destinations, and generally include residential areas, employment centers, parks, schools and civic centers.

Within Moreno Valley, most retail and other consumer service centers, major employers, office complexes and industrial sites are clustered in specific areas generally associated with major thoroughfares. In relation to this, employment density can be an indicator of bikeway facility demand in terms of commuting trips, but it is also an indicator for shopping trips, especially to areas with concentrations of retail and service businesses. Taken as a whole, activity centers are fairly evenly distributed across the City.

Figure 3: Land Use

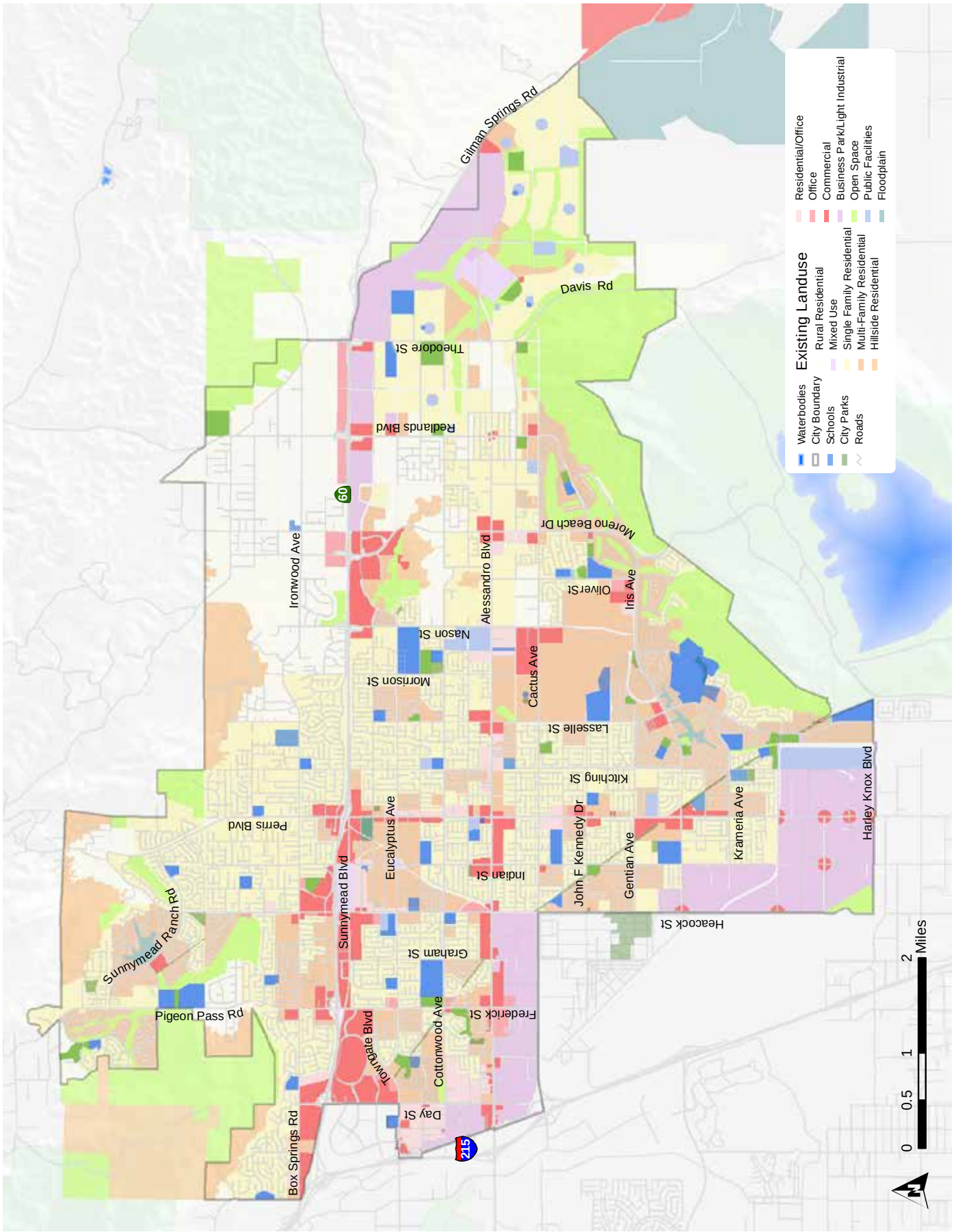


Figure 4: 2000 Population Density

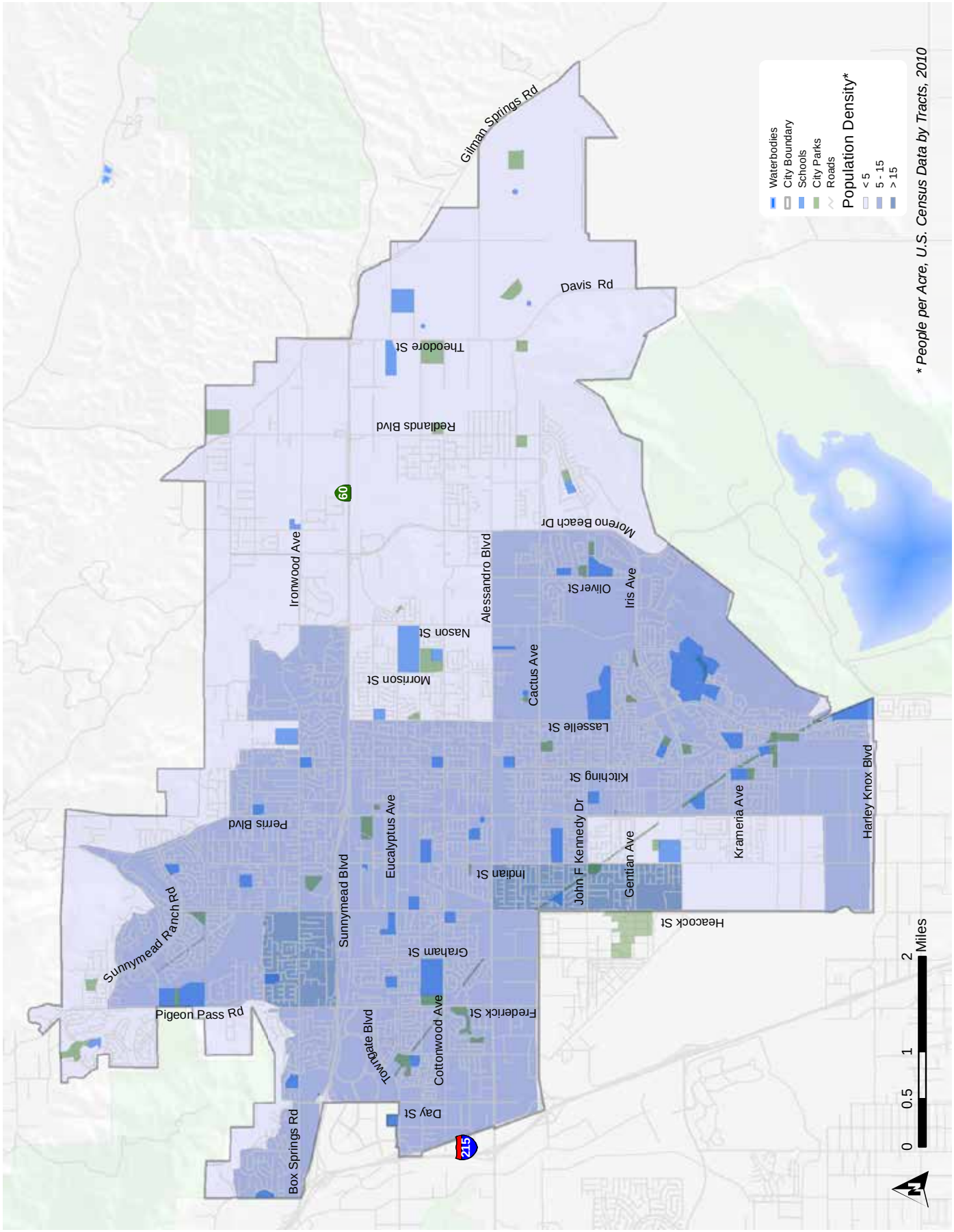


Figure 5: 2000 Employment Density

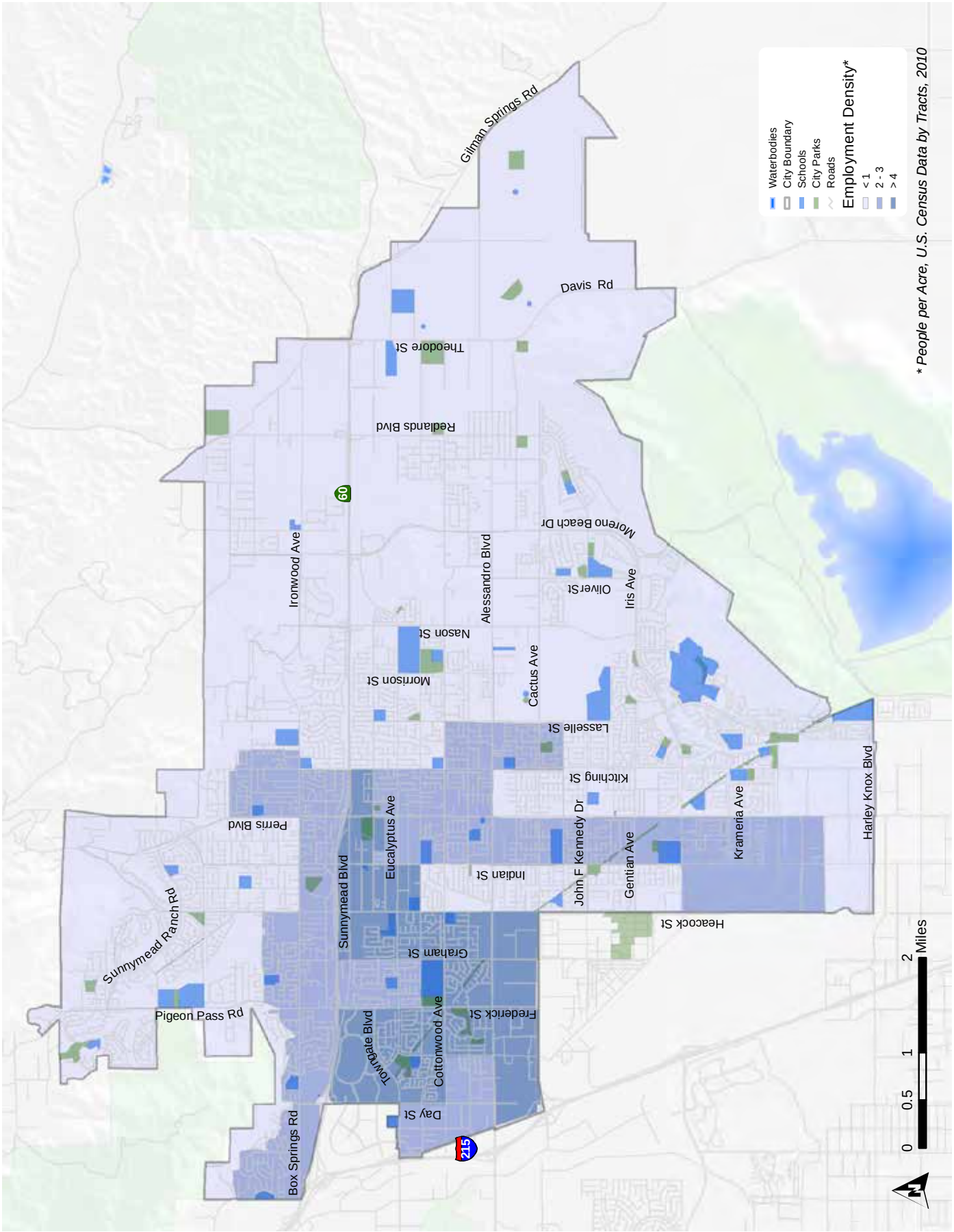
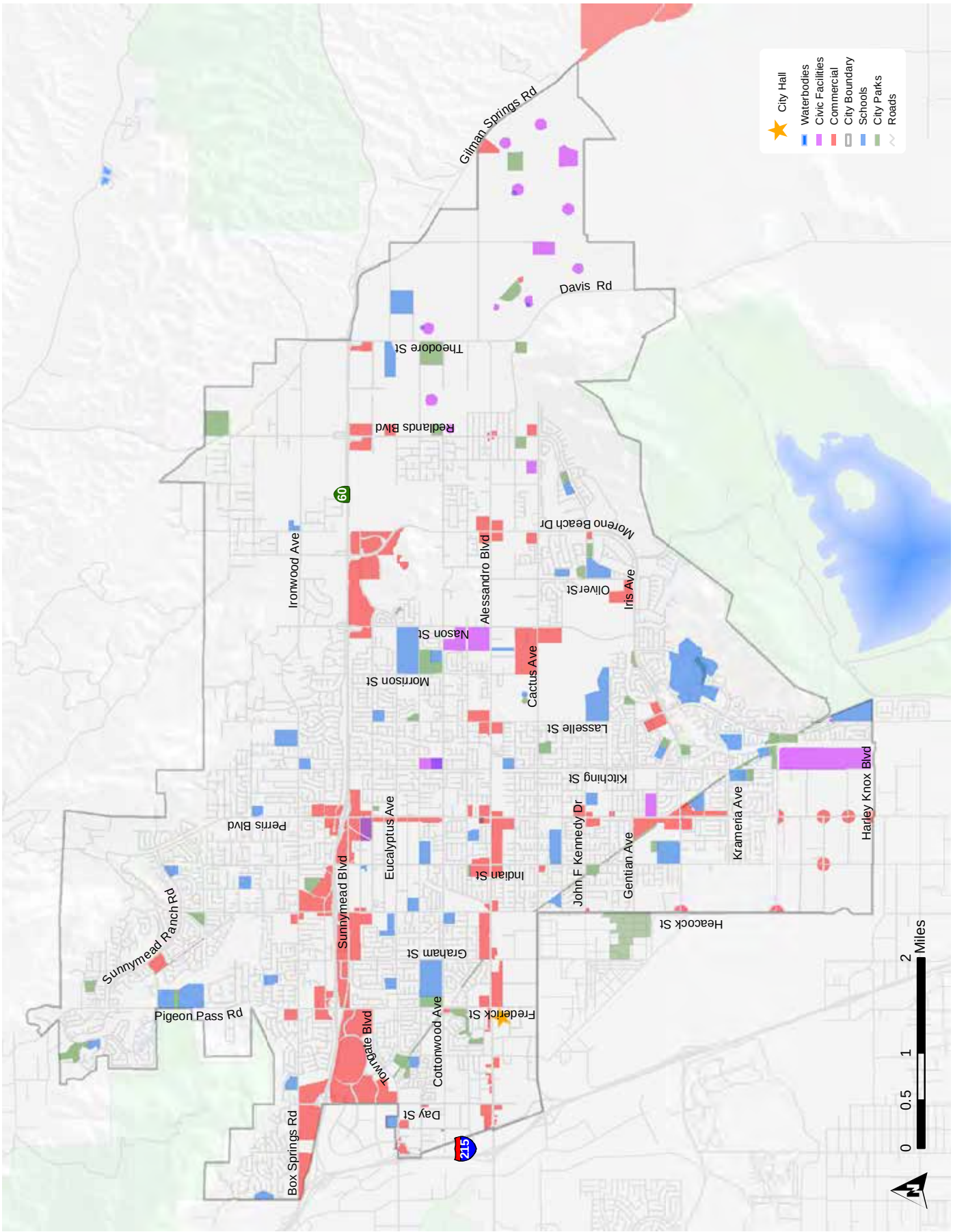


Figure 6: Activity Centers



Employment Centers

Employment centers include the retail complexes along major arterials and the office and commercial complexes primarily along State Route 60. Other employment centers include the education sites such as Moreno Valley College campus, and medical complexes such as the Riverside County Regional Hospital on Nason Street near the City center and the Moreno Valley Community Hospital on Iris Avenue.

Though not within the City limits, another significant employment center is March Air Reserve Base at the southwest corner of Moreno Valley abutting the City of Perris and Interstate 215. Another potentially significant employment center is planned for the eastern edge of the City just north of the San Jacinto Wildlife Area. The World Logistics Center development will encompass almost 4,000 acres. According to the project website:

> *"Vehicles will be directed to utilize specific lanes and access points, and will use the dedicated internal streets, minimizing overlap with existing streets."*

Parks/Schools/Civic Centers

The Moreno Valley Parks and Community Services Department maintains 30 park facilities distributed across the City, from small neighborhood parks to large sports parks with lighted fields.

Lake Perris State Recreation Area borders the City on the southeast. Other open space areas within and immediately adjacent to Moreno Valley may represent opportunities for expanded bikeway connections. In particular is the Lake Perris State Recreation Area's paved route that nearly encircles the lake and plans to complete the loop that will make this even more popular as a recreational and training route. A number of natural surface trails crisscross the recreation area, ranging from wide equestrian-oriented paths on the lower slopes to challenging singletrack trails further up the sides of the hills.

Moreno Valley supports 23 elementary schools, six middle schools, five high schools, six alternative schools and a community college. These make up a significant portion of the overall activity center mapping, second in total acreage to the commercial category.

Origin and Destination Summary

A number of factors drive bikeway facility recommendations and this chapter's maps illustrate factors analyzed for this plan and required by the bicycle master planning statute, California Streets and Highways Code Section 891.2. Besides required factors such as land use, existing and future population and employment density and activity centers, this plan's analysis also addressed public transit availability and overall safety (See following sections).

In general, Moreno Valley represents a typical southern California suburban development pattern since it is primarily made up of fairly low density single family development on generally discontinuous residential streets within an overlay of arterial superblocks, as well as two freeways.

Overall, the locally generally flat topography that probably drove development of the conventional suburban street grid also provides opportunities for multiple routes between typical destinations, such as housing and employment. However, within the current system, not all activity centers are within a reasonable distance of bicycle facilities.

Popular destinations: Schools and parks

2.4 Transit Connections

Physically linking bicycle infrastructure and transit services helps to expand travel options and mobility for cyclists, extending potential trip distances beyond a typical cycling range. These connections also enhance overall mobility and can encourage residents to make more trips using alternative modes of transportation. Recognizing the mobility benefits that come from improving connections between bicycles and transit, this section details a series of recommendations and best practices to encourage and improve active transportation connections to transit.

Improving these connections, and in turn local and regional mobility, is a key objective in the 2012 *Regional Transportation Plan/Sustainable Communities Strategy* (RTP/SCS) prepared by the Southern California Association of Governments (SCAG). SCAG has also placed a specific focus on improving active transportation access to and from transit stations and stops, focusing on extending the access shed for transit services. As part of the bicycle master plan, Moreno Valley is focused on improving access to local and regional transit opportunities in the community as the City looks to contribute its fair share towards regional goals for reducing vehicle miles traveled (VMT) and greenhouse gas (GHG) emissions. Linking bicycle routes and infrastructure to transit services expands the potential travel distance for cyclists and can help to encourage increased cycling and transit usage for commute and non-commute trips.

There are a range of local, regional and inter-regional transit services available to Moreno Valley residents, providing connections between attractions and destinations within the City and into adjacent communities in western Riverside County. Existing and planned transit services include the following:

- The Riverside Transit Agency (RTA) is responsible for providing local and regional bus service within the City.
- The Southern California Regional Rail Authority (SCRRA) operates Metrolink commuter rail services currently to downtown Riverside. SCRRA plans to extend commuter rail service from its existing location in downtown Riverside to Perris by 2015 and this extension will include a Moreno Valley station.
- Amtrak thruway bus service provides long-distance travel services with a stop in Moreno Valley along a route connecting Bakersfield and Hemet.

Riverside Transit Agency

RTA is the local and regional bus provider for Western Riverside County, responsible for operating 36 fixed routes, eight CommuterLink express bus routes, and Dial-A-Ride services using 266 vehicles. In 2013, the agency served 9.3 million riders. RTA routes 11, 16, 18, 19, 20, 35, 41, 208 and 210 service Moreno Valley. Figure 7a depicts the RTA routes that currently operate in Moreno Valley. Figure 7b shows the bus stops locations, as well as major transfer points between routes. Table 1 identifies the frequency, span of service, and key destinations served by these bus routes.

The following list presents the total monthly ridership by route for the month of February 2014. Note that this information is for the full route, and many routes include sections outside Moreno Valley:

- Route 11 - Moreno Valley Mall, March ARB, Alessandro and Ellsworth: 15,861 riders monthly
- Route 16 - Riverside Downtown Terminal to Moreno Valley Mall: 62,335 riders monthly
- Route 18 - Sunnymead Ranch to Moreno Valley College: 17,714 riders monthly
- Route 19 - Moreno Valley Mall to Perris Station Transit Center, Trumble Road: 45,751 riders monthly
- Route 20 - Magnolia Center, RCR Med Center, Moreno Valley Community Hospital, Moreno Valley College: 25,647 riders monthly
- Route 35 - Beaumont/Banning to Moreno Valley Mall: 5,623 riders monthly
- Route 41 - Mead Valley Community Center to Moreno Valley College and RCRMC: 9,382 riders monthly
- Route 208 - (Commuter Link) Temecula, Murrieta, Sun City, Perris, Moreno Valley, Riverside-Downtown Metrolink Station, Downtown Riverside: 3,846 riders monthly
- Route 210 - (Commuter Line) Palm Desert, Thousand Palms, Morongo Casino, Banning, Beaumont, Moreno Valley, UCR, Riverside-Downtown Metrolink Station, Downtown Riverside: 598 riders monthly

Figure 8 illustrates the level of public transportation to work based on responses from the 2010 U.S. Census.

Figure 7a: RTA Bus Routes in Moreno Valley

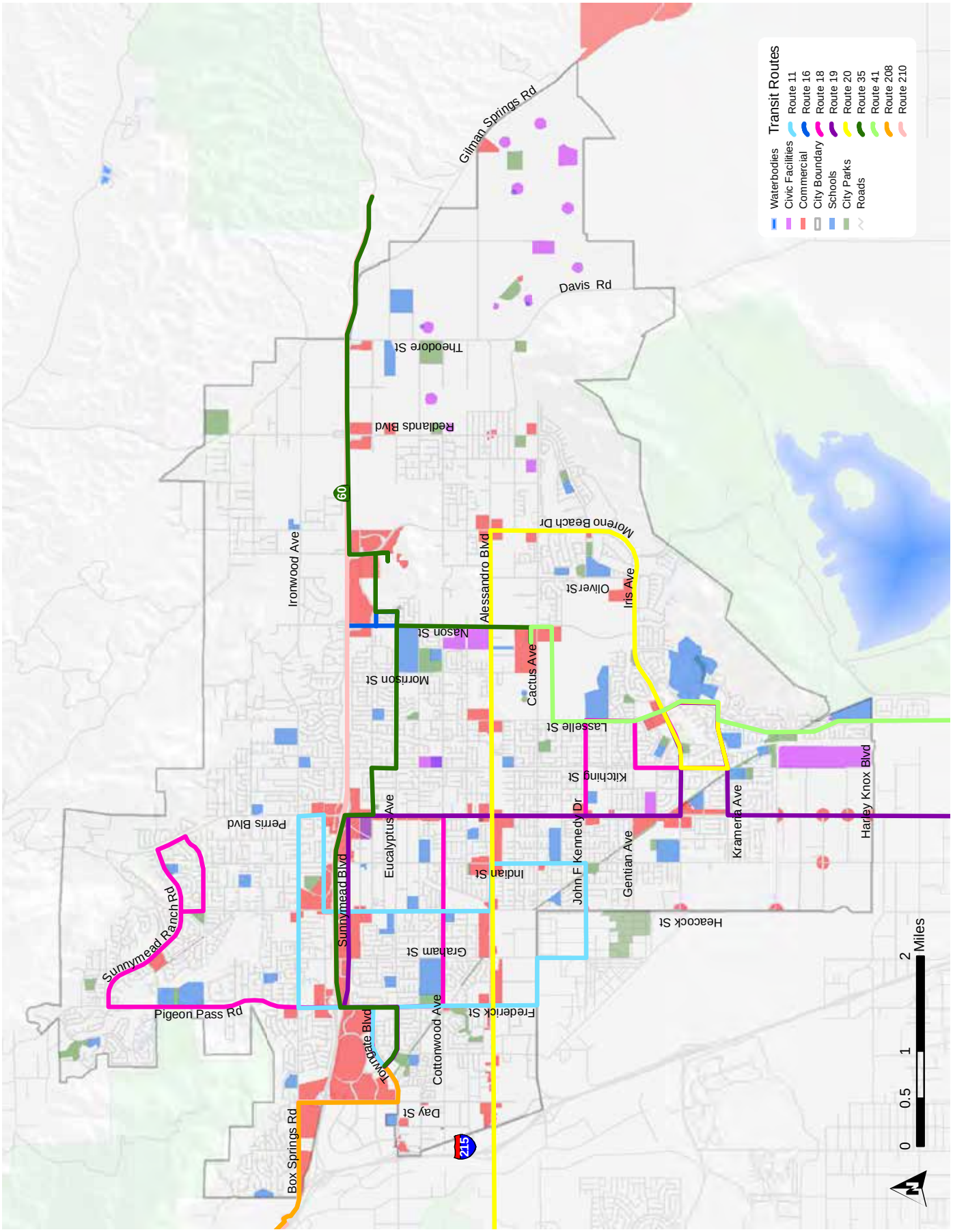


Figure 7b: Bus Stops

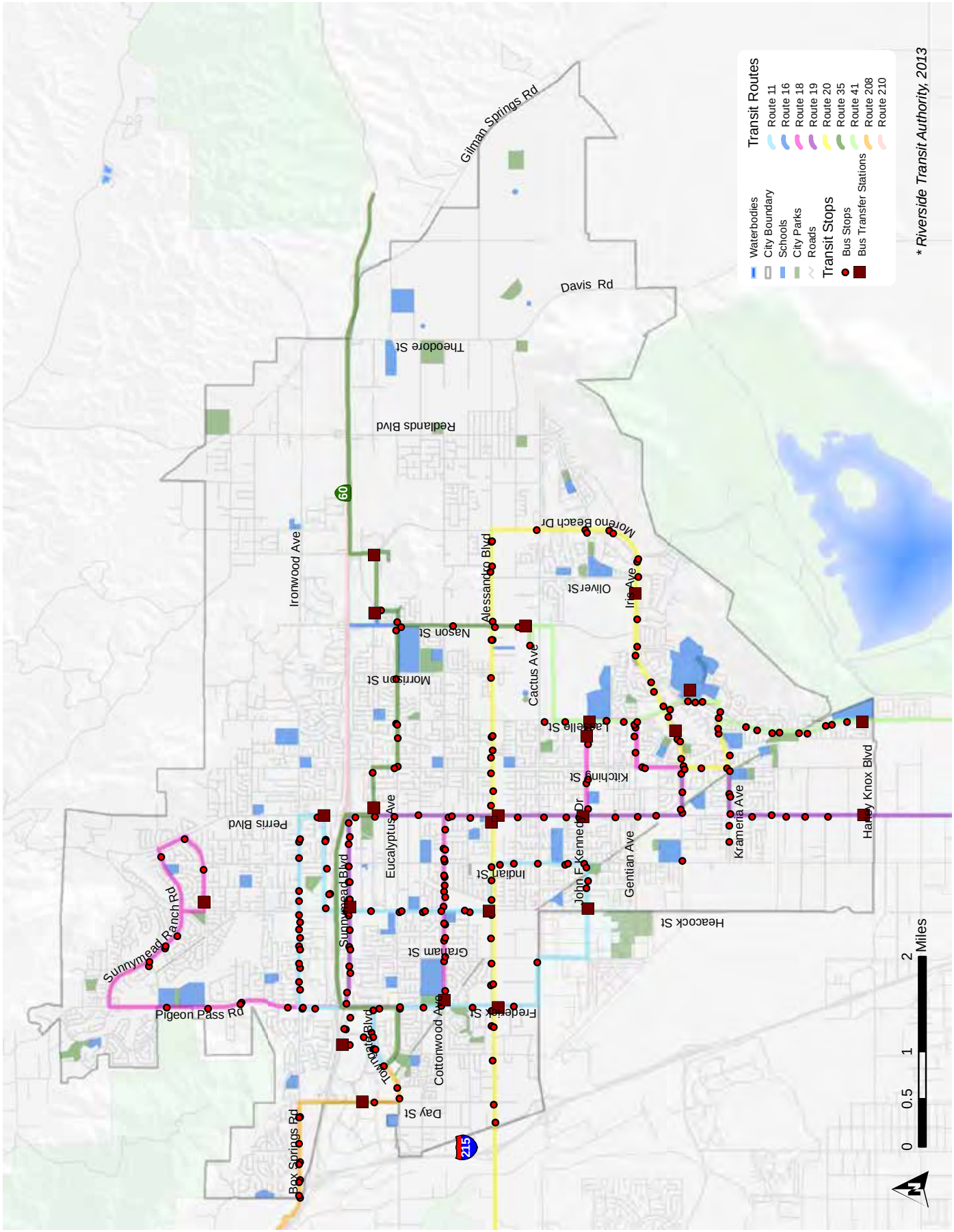
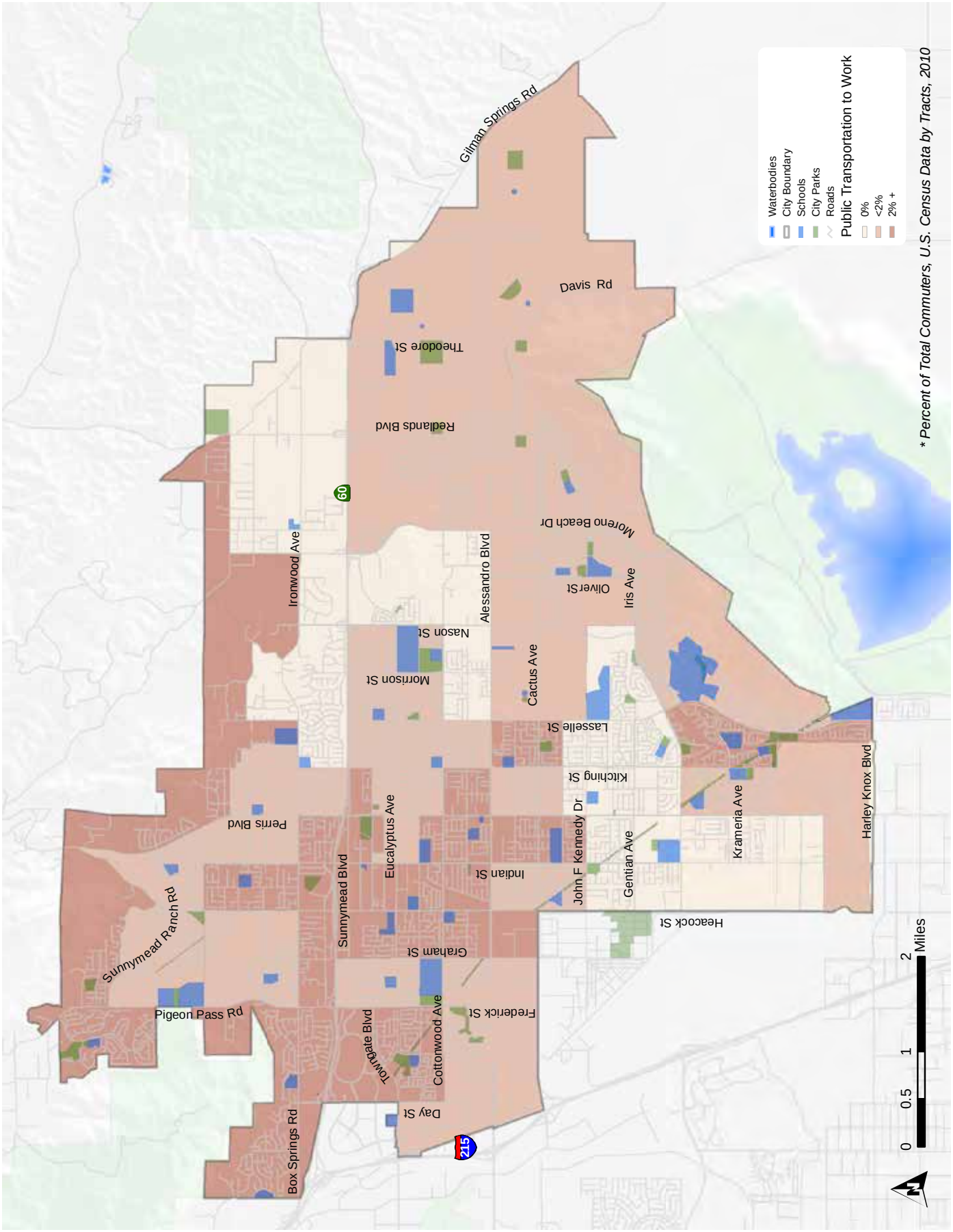


Table 1: Bus Route Details

Route #	Route Name		Weekday	Weekend	Transfer Stops
11	Moreno Valley Mall, March ARB, Alessandro & Elsworth	**Frequency (min)**	60	60	Moreno Valley Mall
		Span of Service	5:30am - 10pm	8:30am - 7:45pm	Perris & Hemlock
					Alessandro & Heacock
					Meyer Dr & 6th St
					Frederick & Alessandro
					Moreno Valley Mall
16	Riverside Downtown Terminal to Moreno Valley Mall	**Frequency (min)**	30	30	Riverside Downtown Terminal
		Span of Service	4:15am - 11:15pm	6:30am - 9:00pm	Riverside-Downtown Metrolink Station
					UCR at Campus Dr
					Moreno Valley Mall
18	Sunnymead Ranch to Moreno valley college	**Frequency (min)**	60	60	Moreno Valley College
		Span of Service	6:00am - 10pm	7:45am - 7:45pm	Lasselle & JFK
					Alessandro & Perris
					Cottonwood & Frederick
					Moreno Valley Mall
					Heacock & Manzanita
19	Moreno Valley Mall to Perris Station Transit Center – Trumble Road	**Frequency (min)**	50	50	Trumble Rd at Exceed
		Span of Service	4:00am - 10:45pm	6:15am - 8:45pm	Perris Station Transit Center
		Sunday span of service		6:15am - 8:15pm	Ross/Lowe's/Starcrest
					Perris & Ramona Exp.
					Moreno Valley College
					Alessandro & Perris
					Sunnymeade & Heacock
					Moreno Valley Mall
20	Magnolia Center, RCR Med Center, Moreno Valley Comm Hospital, Moreno Valley College	**Frequency (min)**	50	50	Magnolia & Elizabeth
		Span of Service	5:20am - 9:45pm	7:00am - 9:00pm	Mission Grove at Social Security
		Sunday span of service		7:15am - 8:00pm	Alessandro & Frederick
					Alessandro & Perris
					RCRMC (nason and Brodiaea)
					Iris at Kaiser Permanente Hospital
					Moreno Valley College
					Iris & Peninsula
35	Beaumont/Banning to Moreno Valley Mall	**Frequency (min)**	65	N/A	Moreno Valley Mall
		Span of Service	6:15am - 7:30pm	N/A	Moreno Valley Senior Center
					RCRMC Moreno Valley
					Super Walmart at Moreno Beach Dr
					Banning Kmart Sun Lakes
41	Mead Valley Community Center to Moreno Valley College and RCRMC	**Frequency (min)**	60	45	Mead Valley Community Center
		Span of Service	5:00am - 7:00pm	8:00am - 7:00pm	Ross/Lowe's/Starcrest
					Perris & Ramona Expressway
					Lasselle & Via DeAnza
					Moreno Valley College
					JFK College
					JFK & Lasselle
					RCRMC Moreno Valley
208	(Commuter Link) Temecula, Murrieta, Sun City, Perris, Moreno Valley, Riverside-Downtown Metrolink Station, Downtown Riverside		**Northbound**	**Southbound**	Promenade Mall
		Frequency (min)	60	70	Los Alamos & Whitewood
		Span of Service	6:45am & 2:30pm	5:00am - 8:15pm	Cherry Hills & Bradley
					Perris Station Transit Center
					Moreno Valley Mall
					Sycamore Canyon & Eastridge
					UCR Lot 30 & Canyon Crest
					Riverside-Downtown Metrolink Station
					Riverside Downtown Terminal
210	Palm Desert, Thousand Palms, Morongo Casino, Banning, Beaumont, Moreno Valley, UCR, Riverside-Downtown Metrolink Station, Downtown Riverside	**Frequency (min)**	60	20	Beaumont Walmart
		Span of Service	3:45am - 6:15am	6:00pm - 7:30pm	Fir & Nason
					Moreno Valley Mall
					UCR Lot 30 & Canyon Crest
					Riverside-Downtown Metrolink Station
					Riverside Downtown Terminal
220	Palm Desert, Thousand Palms, Morongo Casino, Banning, Beaumont, Moreno Valley, UCR, Riverside-Downtown Metrolink Station, Downtown Riverside	**Frequency (min)**	80	15	Town Center Way & Hahn
		Span of Service	4:40am - 8:15am	5:15pm - 9:00pm	Monterey & Dinah Shore
					Casino Morongo
					Beaumont Walmart
					Fir & Nason
					Moreno Valley Mall
					UCR Lot 30 & Canyon Crest
					Riverside-Downtown Metrolink Station
					Riverside Downtown Terminal

Figure 8: Public Transportation to Work Density



2.5 Safety Analysis

Metrolink

Metrolink plans an extension of the Riverside 91 Line commuter rail service from its current terminus in Downtown Riverside to Perris, via Moreno Valley. This 24 mile addition will connect Perris to the Downtown Riverside Metrolink station with four new stations located at Riverside Hunter Park, Moreno Valley/March Field, Downtown Perris and South Perris. Completion of this extension is expected in late 2015.

The planned stop at the Moreno Valley/March Field Station will provide service to the Meridian Business Park, UC Path Center and March Air Reserve Base. The station is planned to be located at Alessandro Boulevard just west of Interstate 215.

Amtrak Bus Service

Amtrak provides an intercity thruway bus service in Moreno Valley connecting Bakersfield and Hemet. The Moreno Valley stop is located on Alessandro Boulevard west of Interstate 215.

Bicycle Collisions

Bicycle collision data were obtained from the City of Moreno Valley for reported bicycle/vehicle-related and bicycle/pedestrian-related collisions from 2007 through 2012. Collisions on off-street paths are not included in the data. Collisions involving cyclists, whether they involve vehicles, other cyclists, or pedestrians, are generally under-reported, so bicycle collisions are likely to have occurred that were not included as part of this data.

There were 226 bicycle/vehicle-related collisions during this five year period. Of these reported collisions, five were fatal. The data were reviewed in terms of collision volume at intersections and on road segments. This data was used to assist in prioritizing projects in later phases. Cycling collisions were also summarized to identify other trends that may help to determine where and what type of physical treatment or education program can be recommended.

Bicycle collision history was considered when developing both infrastructure and programmatic recommendations. While the official causes of bicycle collisions are almost always attributed to the behavior of either the cyclist or another roadway user (typically a vehicle driver), both physical roadway changes and educational programs can have a corrective influence over the behavioral causes of bicycle collisions. In the following chapter, infrastructure improvements are recommended at high collision intersections and roadway segments wherever possible. In other cases, improvements to the citywide bicycle network will provide cyclists with alternatives to problematic intersections or roadway segments.

Table 2: Bicycle Collisions by Day of Week

Day	Collisions
Monday	42
Tuesday	45
Wednesday	33
Thursday	22
Friday	38
Saturday	28
Sunday	18

Table 3: Bicycle Collisions by Time of Day

Time of Day	Weekday	Weekend	Collisions
12am - 3am	2	0	2
3am - 6am	0	1	1
6am - 9am	35	2	37
9am - Noon	15	13	28
Noon - 3pm	40	8	48
3pm - 6pm	49	9	58
6pm - 9pm	33	11	44
9pm - Midnight	6	2	8

Note: There is a higher rate of bicycle collisions during the week and during commuting hours. This may correlate with higher vehicular traffic, as well as higher numbers of cyclists on the road. In either case, this may indicate commuter cyclists should be the focus of safety efforts.

Table 4: Bicycle Collisions by Light Conditions

Lighting	Collisions
Dark - Street Lights	39
Daylight	177
Dusk - Dawn	10

Table 5: Bicycle Collisions by Year

Year	Collisions
2007	29
2008	33
2009	31
2010	30
2011	47
2012	52

Note: There has been a generally steady increase in bicycle collisions in the six years studied.

Table 6: Bicycle Collisions by Severity

Severity	Collisions
Fatal	5
Injury - Complaint of Pain	95
Other Visible Injury	94
Property	23
Severe Injury	8

Table 7: Bicycle Collisions by Road Segment

Road Segment	Collisions
Perris Blvd	24
Alessandro Blvd	23
Lasselle St	19
Heacock St	14
Eucalytpus	12
Sunnymead Blvd	12
Iris Ave	10
Dracaea Ave	7
Hemlock Ave	7

Table 8: Bicycle Collisions by Intersection

Intersection	Collisions
Lasselle St and Iris Ave	7
Alessandro Blvd and Graham St	6
Perris Blvd and Sunnymead Blvd	4
Alessandro Blvd and Alessandro Plaza	3
Alessandro Blvd and Indian St	3
Alessandro Blvd and Perris Blvd	3
Dracaea Ave and Perris Blvd	3
Hemlock Ave and Pigeon Pass Rd	3
Iris Ave and Lasselle St	3
Sunnymead Blvd and Graham St	3
Sunnymead Blvd and Perris Blvd	3

Note: 89 percent of bicycle collisions occurred at intersections.

Table 9: Bicycle Collisions by Bicyclist Age

Age Group	Collisions
0-9	10
10-14	58
15-18	54
19-64	80
65+	10
Unknown	14

Note: 58 percent of all cyclists involved in collisions were 18 or under.

Table 10: Bicycle Collisions by Time of Day and Age

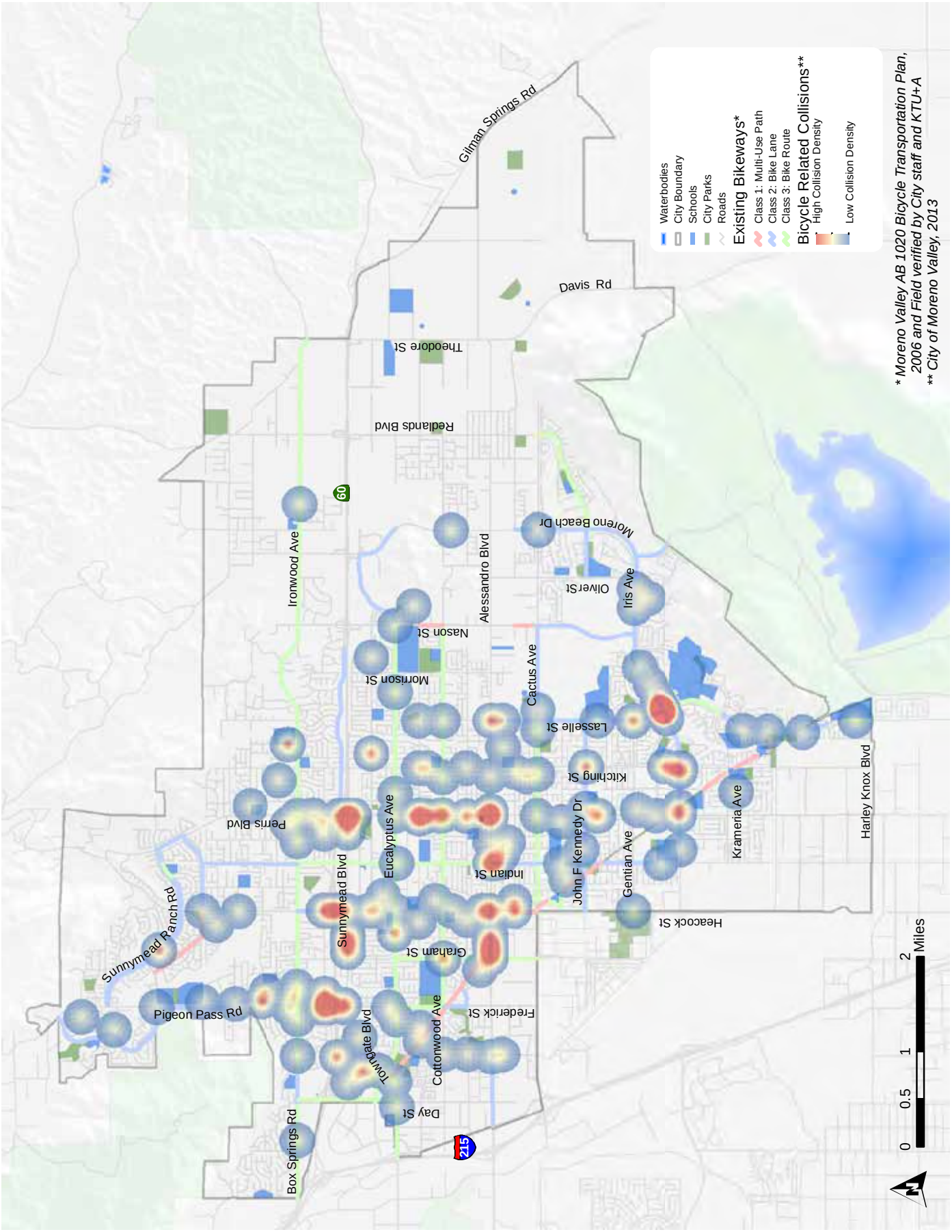
Time of Day	< 18	19 +	Collisions
12am - 3am	-	2	2
3am - 6am	-	1	1
6am - 9am	25	11	37
9am - Noon	11	16	28
Noon - 3pm	23	25	48
3pm - 6pm	28	30	58
6pm - 9pm	28	16	44
9pm - Midnight	2	6	8

Table 11: Bicycle Collisions by Vehicle Code Violation

Primary Collision Factor	Collisions
Wrong Side of Road	56
Auto R/W Violation	44
Improper Passing	25
Other Improper Driving	23
Traffic Signals and Signs	21
Other	16
Unknown	14
Driving Under Influence	7
Unsafe Speed	4
Other Hazardous Movement	4
Unsafe Starting or Backing	2
Pedestrian Violation	2
Pedestrian R/W Violation	2
Other Than Driver	2
Unsafe Lane Change	1
Pedestrian or Other Under Influence	1
Other Equipment	1
Impeding Traffic	1

Note: Many of these violations occurred due to incorrect roadway positioning or drivers and cyclists not following the rules of the road.

Figure 9: Bicycle-Related Collisions



Typical Constraints to Cycling

Studies show that most cyclists tend to prefer roadways with relatively low motor vehicle traffic volumes and speeds. Regular bicycle commuters are probably the least likely to be deterred from using more heavily traveled routes, especially if they are the most direct available. However, when given a choice, even these riders are likely to choose quieter, less traveled routes as long as they do not take them too far out of their way. Recent studies have also shown that women, in particular, are more likely to go somewhat out of their way to avoid uncomfortably high vehicle volumes and speeds.

For this reason, average daily vehicle trips (ADVTs) and posted speed limits are routinely mapped for bikeway planning purposes and were also analyzed for Moreno Valley and illustrated on the next two pages.

Within the context of bicycle and pedestrian facility planning, the FHWA defines high traffic volumes as more than 12,000 vehicles per day. In addition, it is generally discouraged to have cyclists share the roadway with vehicles where posted speed limits exceed 35 mph.

Some of the Moreno Valley's major roadways have both the highest volumes and posted speed limits, but do not have bicycle facilities. While experienced cyclists are generally not deterred by adjacent motor vehicle speeds and volumes where bicycle lanes are available, having to share the roadway becomes a concern where facilities do not exist. Less experienced cyclists are more likely to find such conditions very uncomfortable and may be less likely to use high volume streets. They will tend to ride on alternative streets, preferably adjacent to and parallel with the more heavily trafficked routes they are trying to avoid, provided such routes are available.

Figure 10: Average Daily Vehicle Trips

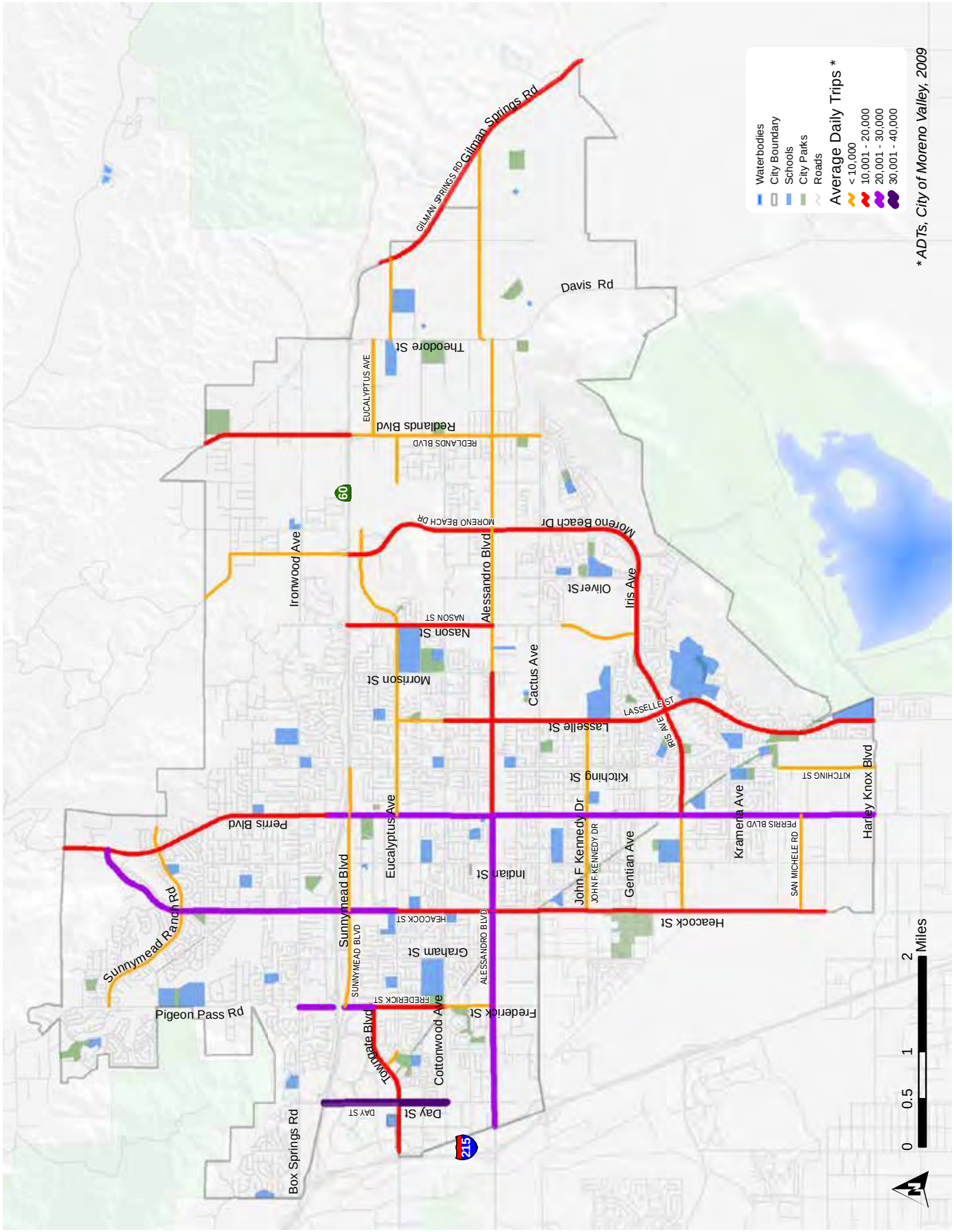
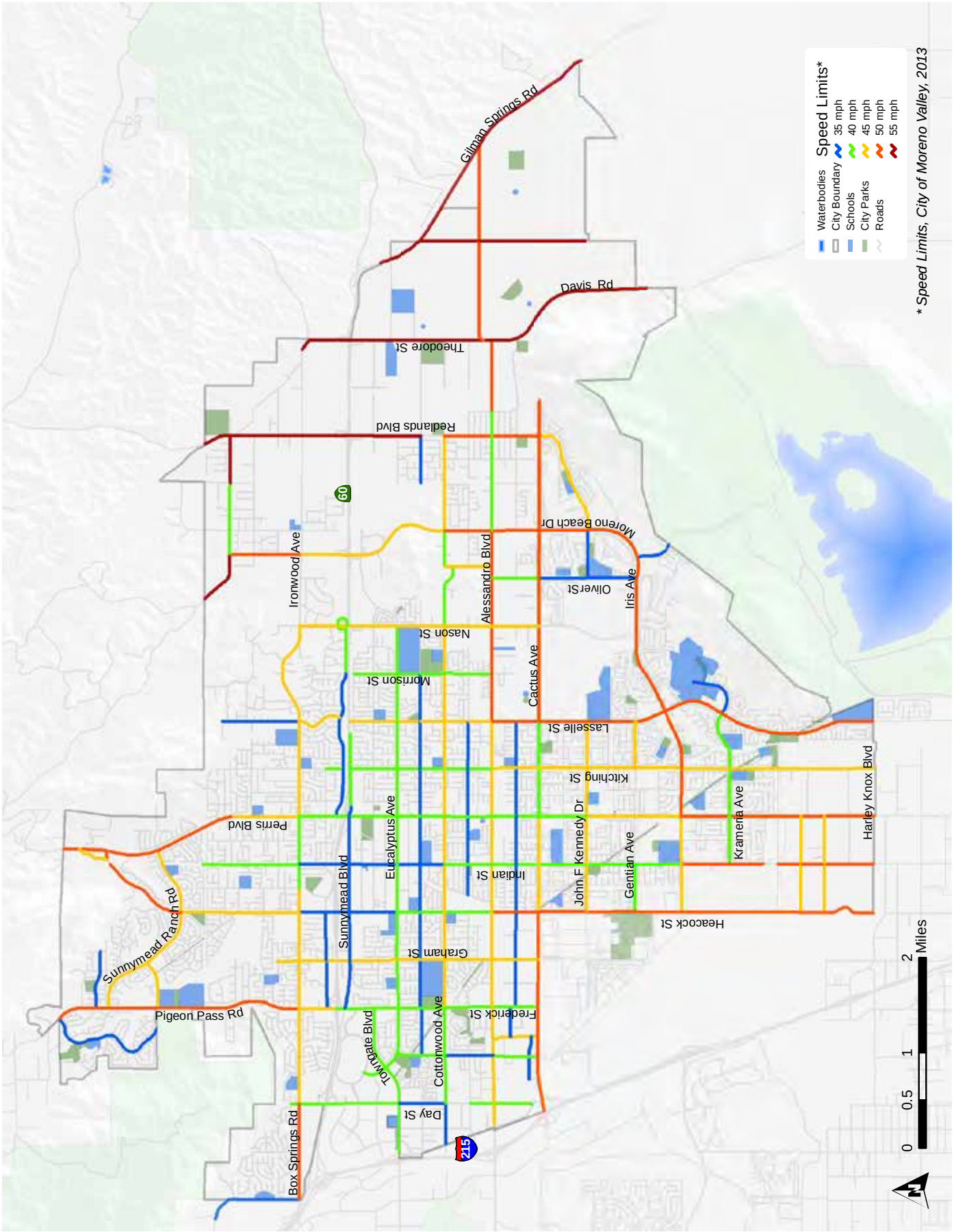


Figure 11: Speed Limits



Facility Criteria Analysis and Feasibility

A list of proposed bicycle facilities was developed with the goal of improving connectivity and generally expanding the dedicated bicycle network. Existing conditions, field observations and public input were all considered. The proposed facilities were then assessed for feasibility and split into the four following categories:

- Class 1 Multi-use Paths – dedicated off-street facilities
- Class 2 Bicycle Lanes – marked and signed lanes in roadways
- Class 3 Bicycle Routes – signage (and lane markings) indicating that cyclists may share roadway space
- Bicycle Boulevards – long roadway segments featuring modifications to improve bicycle flow that do not also increase vehicular flow

The facilities were assessed against criteria specific to the facility type they represented. In some cases, they were assessed against other facility types to determine if a facility could be upgraded. The criteria are described in the follow sections.

Class 1 Multi-use Paths

The typical width and horizontal clearance were measured using high-resolution aerial photos for segments where there appeared to be constraining factors. This data collection was then supplemented with on-site field work. The minimum width for a Class 1 path was considered to be 10 feet for this study, with at least two feet of clearance from obstructions on each side. Crossings at streets or physical barriers were also assessed and special considerations noted.

Class 2 Bicycle Lanes

Feasibility was determined by comparing the actual curb-to-curb roadway width with the minimum width necessary to support the current number of lanes plus five foot bicycle lanes in each direction. For this analysis, the minimum lane widths were considered to be 10 feet for through/turn lanes, and 12 feet for lanes adjacent to curbs. Where parking was permitted, eight feet was added to the total lane width. Painted medians and two-way left turn lanes were considered to be through/turn lanes in most cases. Raised medians and curb lines were considered to be static. These analyses assume that no physical construction or demolition would occur.

Through this comparison, it was determined whether bicycle lanes can be installed along a roadway segment without decreasing the number of lanes or eliminating any parking. The analysis typically broke proposed segments into smaller segments depending on changes in layout or physical characteristics. This meant that a bicycle lane may be feasible within one block and infeasible within the next block if lanes were added or total width changed.

Class 3 Bicycle Routes

Bicycle routes were typically selected where connectivity could be improved by filling gaps in the system, but there was not sufficient space to install bicycle lanes. For this analysis, the total widths of the proposed bicycle route streets were compared to the minimum widths necessary for bicycle lanes (as outlined previously) to ensure that a full Class 2 facility could not be implemented instead as an upgrade.

Bicycle Boulevards

Feasibility was assessed based on the number of intersections currently requiring cyclists to stop along the route. Bicycle boulevards were differentiated from standard Class 3 route facilities by having an increased flow rate for cyclists, so the number of stops or conflicts was a key factor. Since it is assumed that all bicycle boulevards would be considered Class 3 facilities, total width was also recorded to assess the feasibility of sharing the lanes.

2.6 Opportunities and Constraints Summary

Based on this chapter's analysis of existing conditions, survey responses and GIS data, specific factors tended to drive the recommendations in the next chapter.

An important step in the planning process for any transportation project is the assessment of needs. Existing and planned land use, current and projected traffic levels and the special needs of the area population were examined. In addition, bicycle and pedestrian counts were conducted at ten locations identified through GIS modeling and City input. There are circumstances in which a portion of the transportation need might be served by non-motorized means, as well as locations where existing bicycle demand would be better served by improved facilities. Using the following land use and location factors help to highlight the potential for non-motorized travel and to determine cyclists' needs at the street level. The roadway may be suitable for bicycle travel if it:

- Serves an activity center, which could generate bicycle trips
- Is included on a regional, county or municipal bicycle master plan
- Provides continuity with or between existing bicycle facilities, including those of adjacent municipalities
- Is located on a roadway that is part of a mapped event or club bicycle route or utilized regularly by local bicycle clubs
- Passes within two miles of a transit center
- Passes within two miles of a high school or college
- Passes within a half mile of an elementary school or middle school
- Passes through an employment center, especially if there is a significant residential area within a three mile radius
- Provides access to a recreation area or otherwise serves a recreation purpose

If any one of these factors exists, the roadway has the potential to attract cyclists of various types and should be considered as potentially appropriate for designation as a bikeway.

This assessment also addresses other factors such as safety, public input, GIS modeling and field work. These topics all relate to one another and help identify what is needed for a complete bikeway system. For example, safety concerns were analyzed by identifying bicycle-related collision locations, frequencies and causes, and especially the frequency at a certain notable locations. Cross-referencing these collisions and locations helps to identify where it may be best to install a bicycle facility to connect with other facilities, as well as future development.

Four data-intensive exercises were conducted in the analysis phase:

- Bicycle Suitability Model
- Level of Traffic Stress
- Benefit-Cost Analysis
- Bicycle Collision Rates

These exercises are described in greater detail in the following sections.

Bicycle Suitability Model Overview

As discussed in the previous section, there are many factors that can combine to create a situation where a street becomes an important bicycle connection in a community. To help facilitate and automate this analysis, a Geographic Information Systems (GIS) model was created using maps of several of these factors. The Bicycle Suitability Model was developed to determine the most likely areas within the City where cyclists are likely to be, either currently or if improvements were made. The model was created to first prioritize areas to visit during field work and consider for projects and later to assist with ranking project implementation. The Bicycle Suitability Model identifies existing and potential bicycle activity areas citywide utilizing existing data within an extensive GIS database.

The overall model is comprised of three basic models: the Attractor, Generator and Detractor Models. When these three interim models are combined, they create the Bicycle Suitability Model.

Attractors: These are cycling-related geographic features likely to attract cyclists. Examples of these features are schools, transit and shopping centers.

Generators: These are demographic data indicating potential cyclist volume based on how many people live and work within the cycling activity areas identified in the Attractor Model. Examples of generators are population and employment density, age density and primary mode of transportation to work.

Detractors: These are features likely to discourage or detract people from cycling. These are generally physical limitations such as areas with high numbers of bicycle related collisions, limited lane widths or high posted speed limits.

The model identifies the characteristics of each particular area in geographic space and assigns a numeric value for each of these characteristics. The score per area is then added to create a ranking for that particular area in geographic space. Figure 12 displays the results of the model. For details on the inputs and methodology of the model, see Appendix B: Suitability Model and Project Prioritization.

Benefit-Cost Analysis

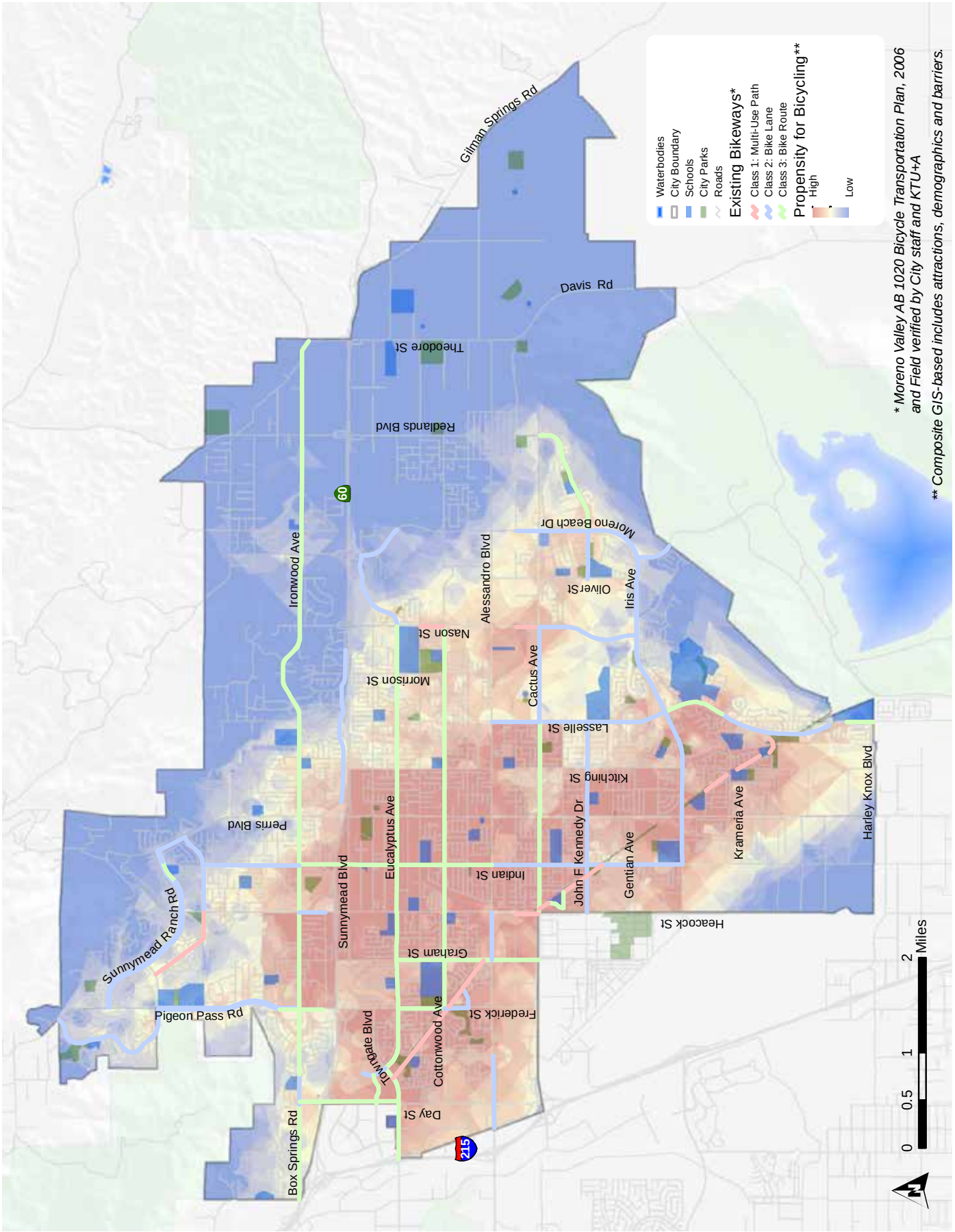
The benefit-cost analysis measures the financial benefits associated with a corridor, normalized by the number of anticipated users (in turn a product of the facility type and length), and divided by rough order of magnitude construction cost estimates.

Using NCHRP Report 552 methods, quarter, half and one mile buffers were drawn around each corridor to obtain American Community Survey (ACS), population and journey to work mode share data. An extrapolation of all bicycle trips was made and estimates of potential ridership developed based on Class 1 path or Class 2 bicycle lane attractiveness functions defined in the NCHRP research. Cost saving benefits were calculated using existing and estimated ridership, annual mobility, health, recreation and reduced auto use.

Bicycle Collision Rates

Bicycle collisions rates address safety through five years of reported data, normalized by crashes per mile. Unlike automobile crashes, the lower bicycle crash volumes and lack of robust, long-term exposure data (such as the number of cyclists using each corridor) means that this dataset is not as statistically sound. However, it is still commonly reported, easily understood and useful. For each corridor, a 100 foot buffer was defined and all reported collisions for the five year period up to February 2013 counted. The total reported collisions were divided by corridor length in miles and segments with higher collisions per mile were prioritized for treatment.

Figure 12: Bicycle Suitability Model Analysis



Level of Traffic Stress

Level of Traffic Stress (LTS) is a fairly recently developed analysis method that addresses the perceived safety related to traffic speed, number of lanes and existing bikeway facility type. In addition to serving as a proxy for safety, the existing bikeway factor is a measure of existing network supply.

Stress increases with traffic speed, number of lanes and lack of existing bikeways. LTS scores can range from 1 (low stress) to 4 (high stress). The tables below are from the Mineta Transportation Institute's *Low-Stress Bicycling and Network Connectivity Report*. The first table describe the four stress level categories and the second defines what stress levels will result when bicycle lanes or routes are applied to specific roadway configurations and speed limits. The model was created using City data, including speed limits, number of lanes and the presence or absence of bicycle facilities (See Figure 13).

High stress and low stress routes are prioritized for treatment, and streets with either a low stress (LTS 1) or high stress (LTS 4) were given an equal scoring value. The reasoning behind this is that both are ideal for increasing ridership based on their existing condition (LTS 1) and improvements to be made for high stress streets (LTS 4). In the case of high stress streets, many arterials are direct travel routes while local, low-stress streets tend to be residential connectors to schools and parks. For transportation purposes, arterials can better serve the needs of people who bicycle to work, providing a more direct route, and can often be improved with facility enhancements.

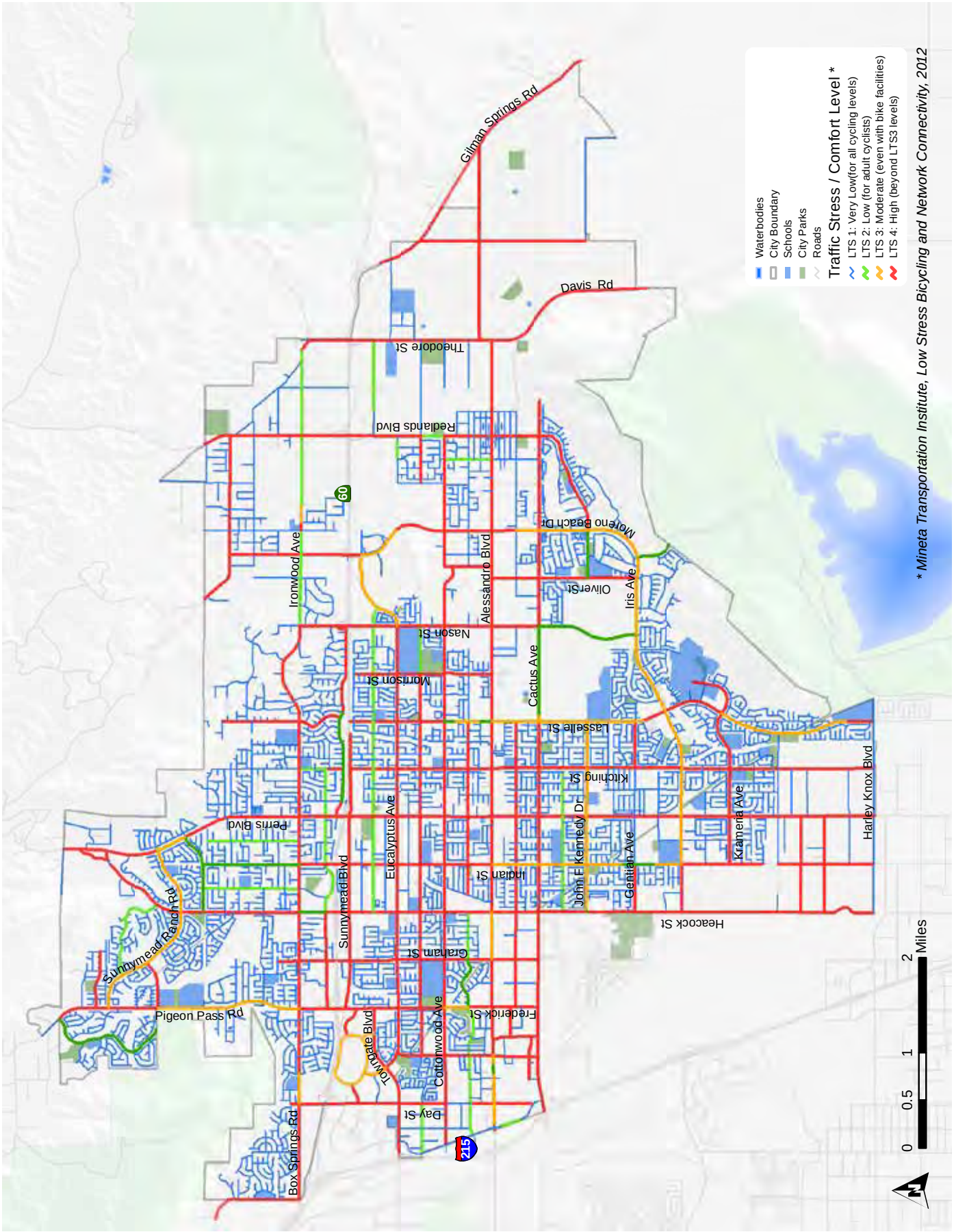
Stress Category	Stress Indicator
LTS 1	Suitable for almost all cyclists, including children trained to safely cross intersections.
LTS 2	Suitable to most adult cyclists but demanding more attention than might be expected from children.
LTS 3	Welcome to many people currently riding bikes in American cities.
LTS 4	A level of stress beyond LTS3.

Shared Facilities (Bike Route)				
	Number of Lanes			
Speed Limit	2	3 (2+1)	4-5 (4+1)	6+
25	1	2	3	4
30	2	3	4	4
35+	4	4	4	4

Bike Lanes (With On-Street Parking)		
	Number of Lanes	
Speed Limit	2	3+
25	1	1
30	1	1
35	2	2
40+	3	3

Bike Lanes (Without On-Street Parking)				
	Number of Lanes			
Speed Limit	2	3	4+	Buffered
25	1	1	1	1
30	1	2	1	1
35	2	3	2	2
40+	3	3	3	2

Figure 13: Level of Traffic Stress Model



3 Recommendations

3.1 Recommended Goals, Policies and Objectives

The following goals, policies and objectives have been developed for this plan in accordance with previous planning efforts and relevant State legislation governing air quality, public health and equitable access. This plan capitalizes on many of the goals, policies and objectives included in Section 2.1: Existing Plans.

Increased Park Space

The General Plan states that neighborhood parks and recreation are to be provided within walking distance and at a reasonable cost, but many Moreno Valley residences lie beyond reasonable walking distance from parks and recreation opportunities. This bicycle master plan therefore proposes facilities with the potential to help mitigate this issue, and at no cost to the user.

Bicycle facilities increase park usage by offering improved access to existing parks, and by creating new, linear parks from existing neighborhood corridors, such as paths along flood control channels. By accommodating speedier travel, bicycle facilities help to shrink space, essentially bringing parks closer to residents. Bicycle boulevards or, as they are now often called, neighborhood greenways, have the potential to calm traffic and "green" the neighborhood, providing a linear park-like atmosphere. Class 1 multi-use paths facilities are another type of facility recommended in this plan that would contribute to increased park space. The General Plan offers strong and explicit support for the use of existing drainage courses, utility rights-of-way and other areas of opportunity for multi-use paths. The Riverside County Flood Control and Water Conservation District generally supports such use, but implementation of projects located within their jurisdiction will require agency coordination.

Freeway Interchange Redesign

This bicycle master plan reiterates the General Plan's call for freeway interchange redesign, but takes it a step further since interchanges often represent the "highest stress" link of a bicycle facility and, as such, require special effort to accommodate cyclists of all ages and abilities.

Programs

This bicycle master plan calls for the implementation and expansion of many programs included in the City's 2006 *Bicycle Transportation Plan*, including the creation of a traffic garden and its integrated use by local school children, as well as the involvement of law enforcement officers in bicycle/pedestrian and traffic safety education efforts.

Goals

- Create a network of Complete Streets.
- Make cycling an attractive and safe mode of transportation for people of all ages and abilities.
- Alternative text: Create a bicycle network and complementary menu of programs that make cycling a viable transportation option for people of all ages and abilities.

3.2 Recommended Facilities

Policies

- Address AB-1358, California's Complete Streets legislation, by implementing a layered network of transportation facilities, in which the bicycle network proposed in this plan is one layer.
- Transportation planning efforts must evaluate impacts to all users and acknowledge the economic, environmental, health and social trade-offs involved in providing for each mode.
- Corridors and facilities identified by the bicycle master plan are seen to improve access for non-motorized travel. As such, and per the 2009 Proposed Guidelines Amendments for the California Environmental Quality Act, which removes vehicular Level of Service as an environmental impact and permits jurisdictions to adopt their own measures of performance, these corridors are exempt from considerations of vehicular level of service.

Objectives

- Create a Bicycle and Pedestrian Working Group.
- In conjunction with City Staff, this group shall develop targets regarding the implementation of the facilities and programs proposed in the bicycle master plan. Important targets include network completion, program implementation, mode share and safe cycling/collision reduction.
- This group shall meet as much as once per month and no less than quarterly.
- Efforts should be made to assemble a group that is diverse with respect to gender, race, socioeconomic status and age. The group should include a Safe Routes to Schools delegation.

Typical flood control channel

This chapter's recommended facilities identify improvements to the existing bikeway system. These projects will have a significant impact, such as closing major gaps and extending or developing multi-use paths, bicycle lanes or routes along major transportation corridors. The numbering used to identify projects within each bikeway facility class in the following sections does not necessarily imply priority beyond the facility category. Bicycle facility implementation has no specific time line, since the availability of funds for implementation is variable and tied to the priorities of the City's capital projects.

This chapter's tables list recommended projects and the associated figures identify their locations and project ranking. If there is desire, proposed projects can be re-ranked within the five year bicycle master plan update cycle at whatever interval best fits funding cycles or to take into consideration the availability of new information, new funding sources, updated crash statistics, updated CIP lists, etc. Bikeway facility prioritization and implementation should be fine-tuned and adjusted accordingly based on future circumstances. More information regarding the ranking process can be found in Appendix B: Suitability Model and Project Prioritization. Cost estimates for these projects are included in Chapter 4: Bikeway Funding.

Class 1 Multi-use Paths

Because they are constructed independently of existing or programmed motor vehicle facilities, Class 1 paths are by far the most expensive of all bicycle facilities. Typical costs per mile can vary a great deal due to possible right-of-way acquisition, bridges and other potential major expenses such as extensive grading due to hilly topography and facility width. For example, a Class 1 facility being converted from a former rail roadbed across flat terrain will require far less grubbing, grading and structural enhancements than a facility being constructed through an undeveloped area with hilly topography and stream crossings (See Figure 14).

Additional multi-use paths are primarily recommended along the flood control channels to provide off-street connections throughout the City. These routes provide bicycle facilities separated from vehicular traffic and connect to parks, schools and other existing and proposed bicycle facilities.

Figure 14: Recommended Class 1 Multi-Use Paths ("Bicycle Paths")

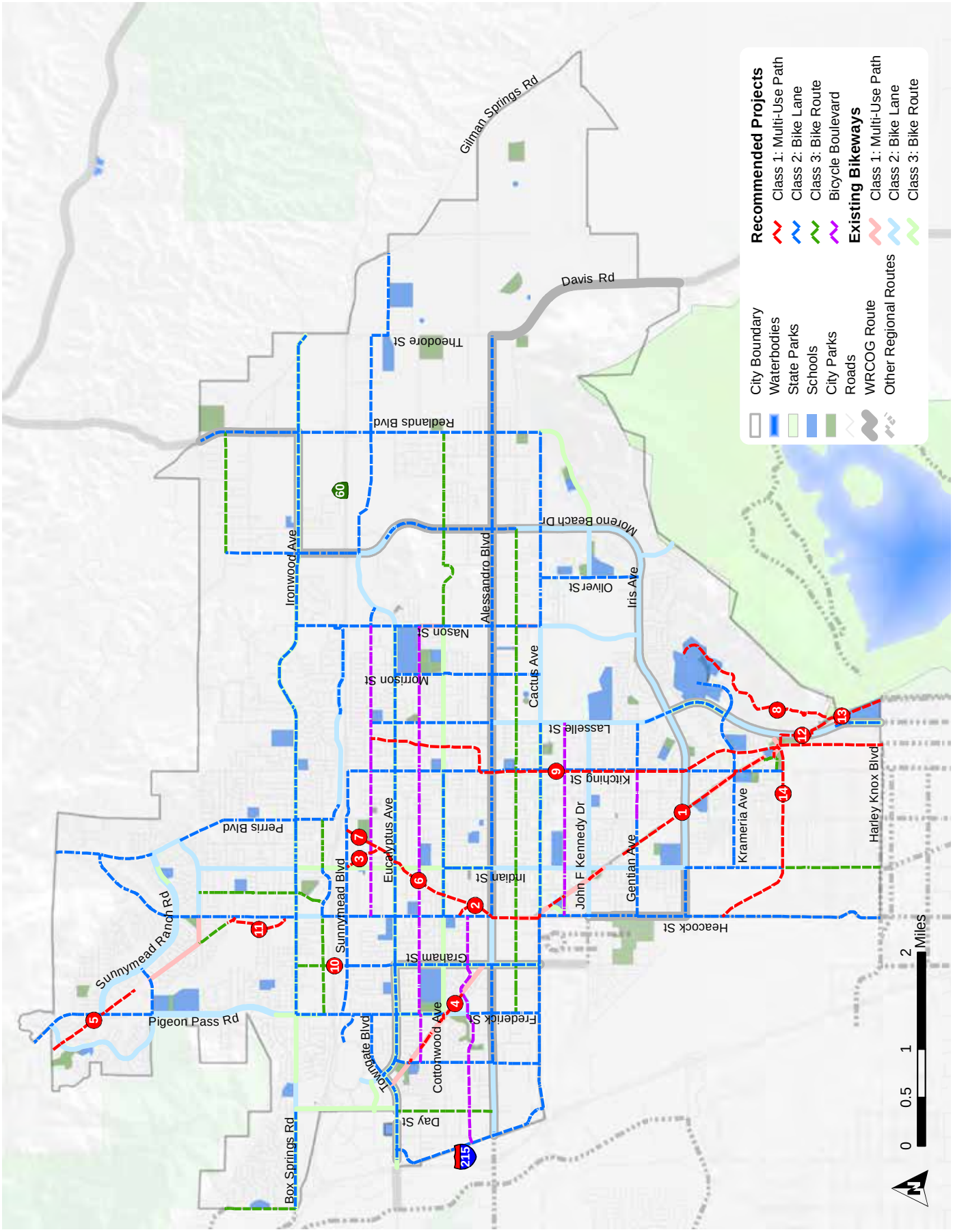


Table 12: Recommended Class 1 Multi-Use Paths

					Recommended Improvements	
Rank	Length (Miles)	Facility	From	To	Crosswalks	Enhanced Crosswalks
1	2.9	Juan Bautista De Anza Trail (P8)	Alessandro and Heacock	Portrero Park	• Minor crossing: Unity Ct • Minor crossing: Sun Valley Rd • Minor crossings: Filaree and Fay Ave • Requires use of some enhanced Class 3 facilities (see notes)	• Alessandro and Heacock • Brodiaea and Heacock Ave • Cactus and Heacock Ave • John F Kennedy Dr • Mid-block: at Indian Ave and Class 1 • Improve existing Home Depot crossing • Iris Ave • Krameria Ave • At Kitching St
2	0.41	Juan Bautista De Anza Trail (P4)				• Connecting to Creekside Elementary School
3	0.5	Juan Bautista De Anza Trail (P6)			• Minor crossing: Webster Ave	• Sunnymead Blvd
4	0.67	Juan Bautista De Anza Trail (P3)	Eucalyptus	E Alessandro	• Balboa Ln • Minor crossing: Baywood Dr and PanAm Blvd • Minor crossing: Caspian Way and Bay Ave	• Elsworth • Cottonwood Ave and Frederick St intersection, esp. western and southern legs • Alessandro • Graham
5	1.06	Juan Bautista De Anza Trail (P1)	Hidden Springs	Class 1	• Three at Hidden Springs and Pigeon Pass • Three at Pigeon Pass and Old Lake • Minor crossing: Village Rd, Mendoza Rd	• Pigeon Pass • Old Lake
6	1.28	Juan Bautista De Anza Trail (P5)			• Minor crossings: Dracaea, Atwood, Indian, Eucalytpus and Meyers	• Cottonwood Ave
7	0.29	Juan Bautista De Anza Trail (P7)				
8	1.73	Moreno Valley College Path	Water Tower	Rancho Verde High School/ southern extent of "Segment 9"		
9	4.47	Kitching Aqueduct Path	Fir	Portrero Park	• Minor crossings: Fir Ave • Minor crossings: Dracaea and Bay	• Eucalyptus • Alessandro • Cactus • John F Kennedy • Iris & Kitching • Vista Verde Middle School

Median Refuges	Curb Extensions	Other Enhancements	Notes
• Alessandro and Heacock • John F Kennedy Dr • Mid-block: at Indian Ave and Class 1 • Iris Ave • Krameria Ave • At Kitching St	• Cactus Ave and Heacock Ave • John F Kennedy Dr		• Straightening out path to better suit utilitarian use is also recommended • May potentially fill gaps through enhanced Class 3 projects with Aqueduct Trail • Wayfinding recommended throughout
• Connecting to Creekside Elementary School			
• Sunnymead Blvd			
• Elsworth • Alessandro • Graham	• Widen sidewalk to Class 1 extent northern edge of Cottonwood Ave and eastern edge of Frederick St • Widen sidewalk along eastern edge of Frederick		• Mid-block crossing • Potentially recommend 2-way cycle track • Use Alessandro Blvd bicycle lanes here
• Pigeon Pass • Old Lake			
• Cottonwood Ave			
		• Through Sunnymead Blvd	
			• Requires paving, but leaving ROW for equestrian path
• Eucalyptus • Alessandro • Vista Verde Middle School			• May require enhance due to crossing location and orientation • Connects with southern end of Juan Bautista de Anza trail

					Recommended Improvements	
Rank	Length (Miles)	Facility	From	To	Crosswalks	Enhanced Crosswalks
10	0.1	Graham St Bicycle/ Pedestrian Bridge	N edge of SR-60	South edge of SR-60		
11	0.73	Juan Bautista De Anza Trail (P2)	Class 1	Kernwood	• Minor crossings: un-named intersection, Sandpiper Ct and Cockatiel Dr	
12	0.53	Juan Bautista De Anza Trail (P9)	Portrero Park	Class 1 (Segment 11)	• Minor crossing: Equestrian Way	• Avenida de Plata and Lasselle St
13	0.47	Rancho Verde High School Path	Rancho Verde High School/ southern extent of Segment 9	Southern City Limit		
14	3.21	South City Aqueduct Path	Heacock	Kitching		• Heacock • Perris

Median Refuges	**Curb Extensions**	**Other Enhancements**	**Notes**
			Future Opportunity
		• Shared Lane Markings	• Enhanced Class 3 recommended • Though improved path already exists along Parkland Ave along median, several intersections present issues in terms of convenience and safety
	• Avenida de Plata and Lasselle St		
• Perris	• Perris	• Improve north leg of Indian to provide network connection • Short leg of Class 1 required to connect (N) to Plumeria • Short leg of Class 1 required to connect (N) to Kitching	• Could provide Class 1 bridge over adqueduct, to connect to south City

Class 2 Bicycle Lanes

Moreno Valley has bicycle lanes on some major arterials and additional recommended lanes are primarily gap closures and traffic calming installations. The latter applies in some cases to very wide streets without bicycle facilities, where bicycle lanes and associated buffering are recommended to both perceptually narrow streets to slow vehicular traffic and to provide better facilities for cyclists (See Figure 15).

Class 3 Bicycle Routes

Bicycle routes are recommended as additional gap closures and connections where the vehicular speed, geometry and traffic volumes allow cyclists to share the road with vehicles. In many cases, the gap closures are short segments that connect bicycle lanes, schools and parks in low volume, low speed residential streets. Where bicycle lanes cannot be accommodated because of available right-of-way, bicycle routes are recommended when safety criteria are met (See Figure 16).

Bicycle Boulevards

Bicycle boulevards are generally shared lane facilities with prominent pavement markings. Traffic diverters, roundabouts, traffic circles and other calming measures are all amenities that can make up a bicycle boulevard. However, the priority of bicycles over vehicles is what makes a street with bicycle facilities a bicycle boulevard. The recommended bicycle boulevards primarily connect schools near the downtown district and higher density population areas.

Bicycle boulevards require additional planning and engineering prior to implementation. Impacts to vehicular traffic flow, bicycle and pedestrian safety improvements at intersections and crossings, right-of-way acquisition, signage and utilities are examples of associated items that would require in-depth analysis. Education and enforcement of these facilities is also recommended to assist the community in correctly utilizing them following implementation. Examples of education programs are included in this chapter (See Figure 17).

The following maps and tables describe the recommended projects developed through project analysis and input from City staff, the community and advocacy groups.

The tables show the results of the analysis along with notes about facilities and any field observations. The "Notes" column provides additional information addressing the existing condition for each segment. This may include additional constraints, guidelines or other unique factors that should be considered prior to project development. Total width was verified in the field where it was within four feet of the minimum needed. The width columns illustrate the difference between the needed width and existing width for the recommended facility type. The "Delta" column employs a color coding system to summarize improvement feasibility. Green indicates feasible, red indicates infeasible and blue indicates a value within four feet of the minimum width needed.

Figure 15: Recommended Class 2 Bicycle Lanes

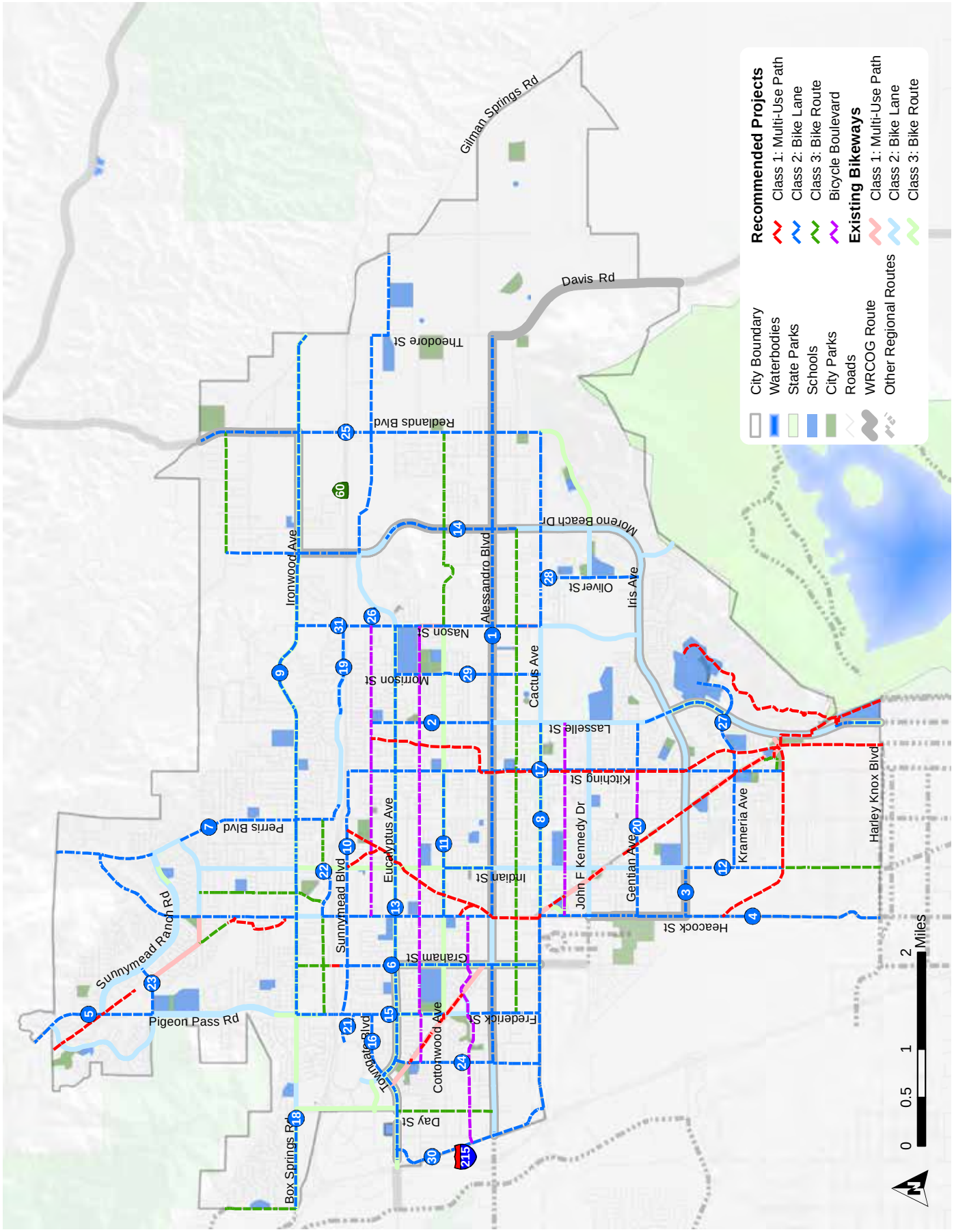


Table 13: Recommended Class 2 Bicycle Lanes

Rank	Length (Miles)	Facility	From	To	Delta	Future Opportunity	Notes
1	8.05	Alessandro Blvd	I-215	Day St	6		• Opportunity for buffering
			Day	Grant	6		• Opportunity for buffering
			Grant	Frederick	16		• Opportunity for buffering
			Frederick	Graham	10		• Opportunity for buffering
			Heacock	Kitching	16		• Opportunity for buffering
			Kitching	Nason	6		• Opportunity for buffering
			Nason	Redlands	8		• Opportunity for buffering
			Redlands Blvd	Davis	-8	X	
2	2.63	Lasselle St	Fir	Eucalytpus	-4		
			Eucalytpus	Ute Drive	10		• Opportunity for buffering
			Ute Drive	Dracaea	18		• Opportunity for buffering
			Dracaea	Alessandro	-2		• Road undulates • Some places, wider than 30' • Potentially City-owned ROW
			Gentian	Krameria	6		• Opportunity for buffering
			Camino Quintana	Harley Knox	8		• Opportunity for buffering
3	3.84	Iris Ave	Heacock	St. Croix	4		
			St. Croix	Indian	4		• Road widens to 56' approaching Indian; becomes much wider further east
			Indian	Perris	3		
			Perris	Kitching	7		• Opportunity for buffering
			Kitching	Via del Lago	14		• Opportunity for buffering
4	7.64	Heacock St	Perris	Lake Summit	4		
			Lake Summit Dr	Ironwood	10		• Opportunity for buffering
			Just North of Ironwood	Ironwood	4		
			Ironwood	Meyer	3		
			Meyer	Atwood	-5		
			Atwood	Alessandro	9		• Opportunity for buffering
			Alessandro	Cactus	8		• Opportunity for buffering
			Cactus	Meyer Dr	8		• Opportunity for buffering
			Meyer Dr	Poppystone	2		
			Poppystone	Gentian Ave	18		• Opportunity for buffering
			Gentian Ave	Revere Pl	-2		
			Revere Pl	Iris Ave	18		• Opportunity for buffering
			Iris Ave	San Michele Rd	-6		
			San Michele Rd	Nandina Ave	-12		
			Nandina Ave	Harley Knox Blvd	-8		
5	1.72	Pigeon Pass Rd	Hidden Springs Drive N	Hidden Springs Drive S	-1		

Rank	Length (Miles)	Facility	From	To	Delta	Future Opportunity	Notes
6	2.08	Graham St	Olivewood Plaza	Sunnymead	12		• Opportunity for buffering
			Sunnymead	Cactus	-1		• Striped median does not run along entire length of project • Possible road diet candidate
7	2.64	Perris Blvd	Heacock	Canyon Vista	5		
			Canyon Vista	Sunnymead Ranch	5		
			Manzanita	Jaclyn	18		• Opportunity for buffering
			Jaclyn	Ironwood	-8		
			Ironwood	Elder	1		
8	5.97	Cactus Ave	I-215	Veterans	15		• Opportunity for buffering
			Veterans	Ellsworth	27		• Opportunity for buffering
			Elsworth	Heacock	9		
			Heacock	Lasselle	1		
			Lasselle	Hospital	-8		
			Hospital	Nason	7		• Opportunity for buffering
9	6.15	Ironwood Ave	Pigeon Pass	Perris	-4		
			Perris	Tuscola	8		• Opportunity for buffering
			Tuscola	Champlaign	0		
			Champlaign	Vista de Cerros	31		• Opportunity for buffering
			Vista de Cerros	Redlands	-2		• Roadway largely unimproved
			Redlands	Theodore	-8	X	
10	2.52	Sunny-mead Blvd	Frederick St	Perris	4		
11	1.5	Cotton-wood Ave	Heacock	Perris	2		
			Perris	Kitching	-2		

"Delta" *column represents difference between required right-of-way width for bicycle lanes versus existing width. Range between -2 or greater (per side) indicates possibility of bicycle lane installation with some additional design considerations.*

Color coding indicates improvement feasibility: Green indicates feasible, red indicates infeasible and blue indicates field-verified value within four feet (two feet per side) of minimum required.

6	*Green = feasible*
-3	*Red = infeasible*
2	*Blue = value within four feet of minimum*

Rank	Length (Miles)	Facility	From	To	Delta	Future Opportunity	Notes
12	1.5	Indian St	Cottonwood	Alessandro	-6		
			Iris	Mariposa	-8		
13	9.85	Eucalyptus Ave	Memorial	Elsworth	9		• Opportunity for buffering
			Ellsworth	Frederick	-1		
			Frederick	Graham	12		• Opportunity for buffering
			Graham	Heacock	-1		
			Heacock	Kitching	16		• Opportunity for buffering
			Kitching	Montecello	10		• Residential areas are walled with no arterial access
			Montecello	Golden Lantern	2		
			Golden Lantern	Morrison	-1		
			Morrison	Nason	5		
			Moreno Beach Drive	End of Road	-5		
			End of Road	Redlands	12		• Opportunity for buffering
			Redlands	Gilman Springs	5	X	• Bicycle lanes exist in front of Skechers warehouse
14	3.79	Moreno Beach Blvd	Ironwood	Eucalytpus	-8		
			Eucalytpus	Automall Drive	11		• Opportunity for buffering
			Automall Drive	Bend in road	32		• Existing bicycle lanes
			Where street bends south	Cottonwood	8		• Shoulder, but no bicycle lanes
			Cottonwood	Bay	32		• Opportunity for buffering
			Bay	Alessandro	5		
			Alessandro	Brodiaea	8		• ROW varies
			Brodiaea	Via del Lago	10		• Opportunity for buffering
15	1.87	Frederick St	Ironwood	Sunnymead	-1		
			Sunnymead	Centerpoint	2		
			Centerpoint	Brabham	9		• Opportunity for buffering
			Brabham	Towngate	5		
			Towngate	Eucalyptus	12		• Opportunity for buffering
			Eucalyptus	Dracaea	17		• Opportunity for buffering
			Dracaea	Cottonwood	12		• Opportunity for buffering
			Bay Ave	Alessandro	8		• Opportunity for buffering
			Alessandro	Resource	-6		
			Resource	Cactus	-1		
16	0.66	Towngate Ave	Eucalyptus	Frederick	4		

Rank	Length (Miles)	Facility	From	To	Delta	Future Opportunity	Notes
17	4.5	Kitching St	Sunnymead	Skybrook	10		• Opportunity for buffering
			Skybrook St	Fir	14		• Opportunity for buffering
			Fir	Cedarbrook	6		• Opportunity for buffering
			Cedarbrook	Cactus	2		
			Cactus	Gentian	0		
			Gentian	Mariposa	0		
18	1	Box Springs Rd	Morton Rd (or Riverside Rail Trail)	Just west of Pine Cone Lane	0		
			Just west of Pine Cone Lane	Day	7		• Opportunity for buffering
19	2.11	Elder Ave	Perris	Lorez Dr	3		• Can provide buffered facility if parking prohibited
			Lorez Dr	Brewster Drive	16		• Bicycle lanes exist • Buffering recommended
			Brewster	Morrison	3		• Buffering recommended
			Morrison	Nason	16		• Buffering recommended
20	1.48	Gentian Ave	Heacock	Megan	0		
			Megan	Indian	12		• Opportunity for buffering
			Indian	Perris	12		• Roadway largely unbuilt
			Parris	Kitching	-14		
			Kitching	Lasselle	10		
21	0.33	Center-point Dr	Town Circle Dr	Frederick St	5		
22	2.07	Hemlock Ave	Frederick	Heacock	-6		
			Heacock	Indian	8		• Opportunity for buffering
			Indian	Perris	4		
23	0.51	Old Lake Dr	Pigeon Pass N	Sunnymead Ranch	-1		
24	1.49	Elsworth St	Eucalyptus	Dracaea	-4		
			Dracaea	Cottonwood	-1		
			Cottonwood	Alessandro	0		
25	3.54	Redlands Blvd	Northern City Limit	Eucalyptus	0		
			Eucalyptus	Dracaea	-4		
			Dracaea	Bay	28		• Opportunity for buffering
			Bay	Alessandro	-8		
			Alessandro	Just south of Campbell Ave	10		• Opportunity for buffering
			Just south of Campbell Ave	Cactus	8		• Opportunity for buffering

Rank	Length (Miles)	Facility	From	To	Delta	Future Opportunity	Notes
26	0.2	Fir Ave	Nason	Eucalyptus	-5		
27	2.23	Krameria Ave	Indian	Terano	19		• Walled residential areas with no arterial access
			Terano	Perris	-2		
			Perris	Just past Cahuilla / Lasselle ES	-1		• Candidate for road diet
28	1.02	Oliver St	Cactus	John F Kennedy	-4		
			John F Kennedy	Iris	0		
29	1.51	Morrison St	Eucalyptus	Cactus	-4		
30	1.75	Old 215/ Valley Springs Parkway	City Limit	Eucalyptus	10		• Opportunity for buffering
			Eucalyptus	Dracaea	18		• Opportunity for buffering
			Dracaea	Alessandro	18		• Opportunity for buffering
			Alessandro	Cactus	8		• ROW widens at Alessandro
31	2.52	Nason St	Ironwood	Fir	10		• Opportunity for buffering
			Fir	Eucalyptus	6		• Opportunity for buffering
			Eucalyptus	Dracaea	12		• Opportunity for buffering
			Dracaea	Cottonwood	33		• Opportunity for buffering
			Cottonwood	Alessandro	-1		
			Alessandro	Cactus	-11		• ROW undulates dramatically

Figure 16: Recommended Class 3 Bicycle Routes

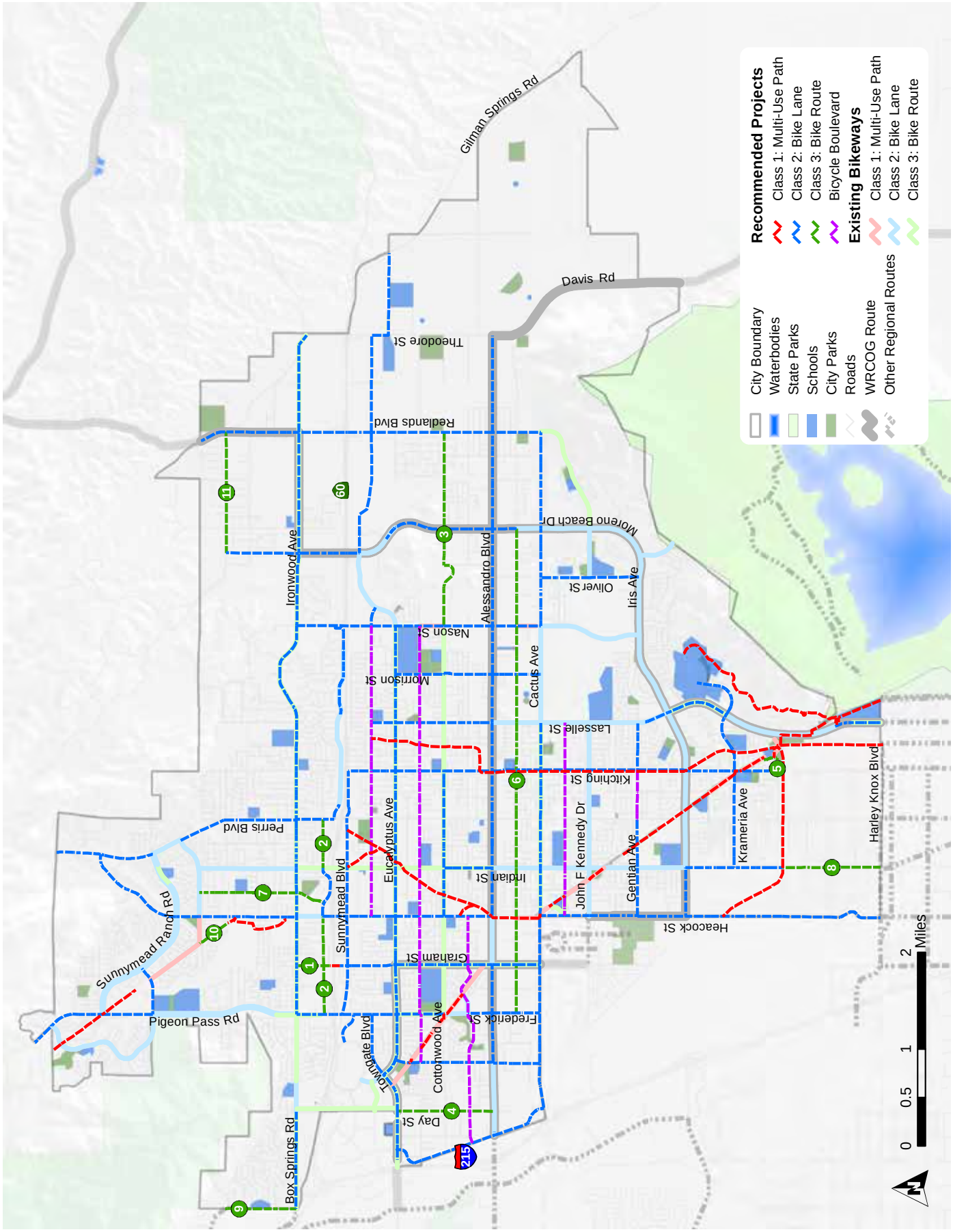


Table 14: Recommended Class 3 Bicycle Routes

Rank	Length (Miles)	Facility	From	To	Delta	Notes
1	0.35	Graham St	Ironwood	Olivewood Plaza	-4	• Recommended in conjunction with dedicated bicycle/pedestrian bridge over SR-60
2	1.52	Hemlock St	Pigeon Pass Rd	Heacock	-4	
			Indian	Perris	-12	
3	2.11	Cottonwood Ave	Nason	Redlands	-10	• ROW varies
4	1	Day St	Eucalyptus	Cottonwood	-7	
			Cottonwood	Sherman	-10	
			Sherman	Alessandro	5	
5	0.3	Camino Bellagio - Via Pamplona - Camino Marilena - Kitching	Class 1 Path (Seg 8)	Via Pamplona	-8	
			Camino Bellagio	Camino Marilena	-8	• Connects to existing Class 1 path - mid-block • Provide wayfinding throughout
			Via Pamplona	Kitching	-8	
			Camino Marilena	Class 1 (Seg 13)	-8	
6	5.01	Brodiaea Ave	Frederick	Moreno Beach Drive	-4	• Segments between Lasselle St and Moreno Beach Dr largely unbuilt
7	1.31	Davis St	Manzanita	Hemlock	-12	• Connect to Midland Elem School • Connects to Manzanita (Class 2) • Gap/unbuilt road may exist between Ironwood and Hemlock
8	1.01	Indian St	Mariposa Ave/ Flood Control Channel	Harley Knox	-1	• Industrial connection
9	0.73	Morton Rd	Penunuri Pl	Box Springs Rd	-4	
10	0.36	Parkland Ave	Southern end of Class 1, Segment 1	Mark Twain	0	
11	1.26	Locust Ave	Moreno Beach Drive	Redlands Blvd	-6	

"Delta" *column represents required right-of-way width to upgrade to Class 2 facility. In some cases where short segments of right-of-way are not wide enough for bicycle lanes, it is recommended to maintain Class 3 status throughout the segment for consistency.*

Figure 17: Recommended Bicycle Boulevards

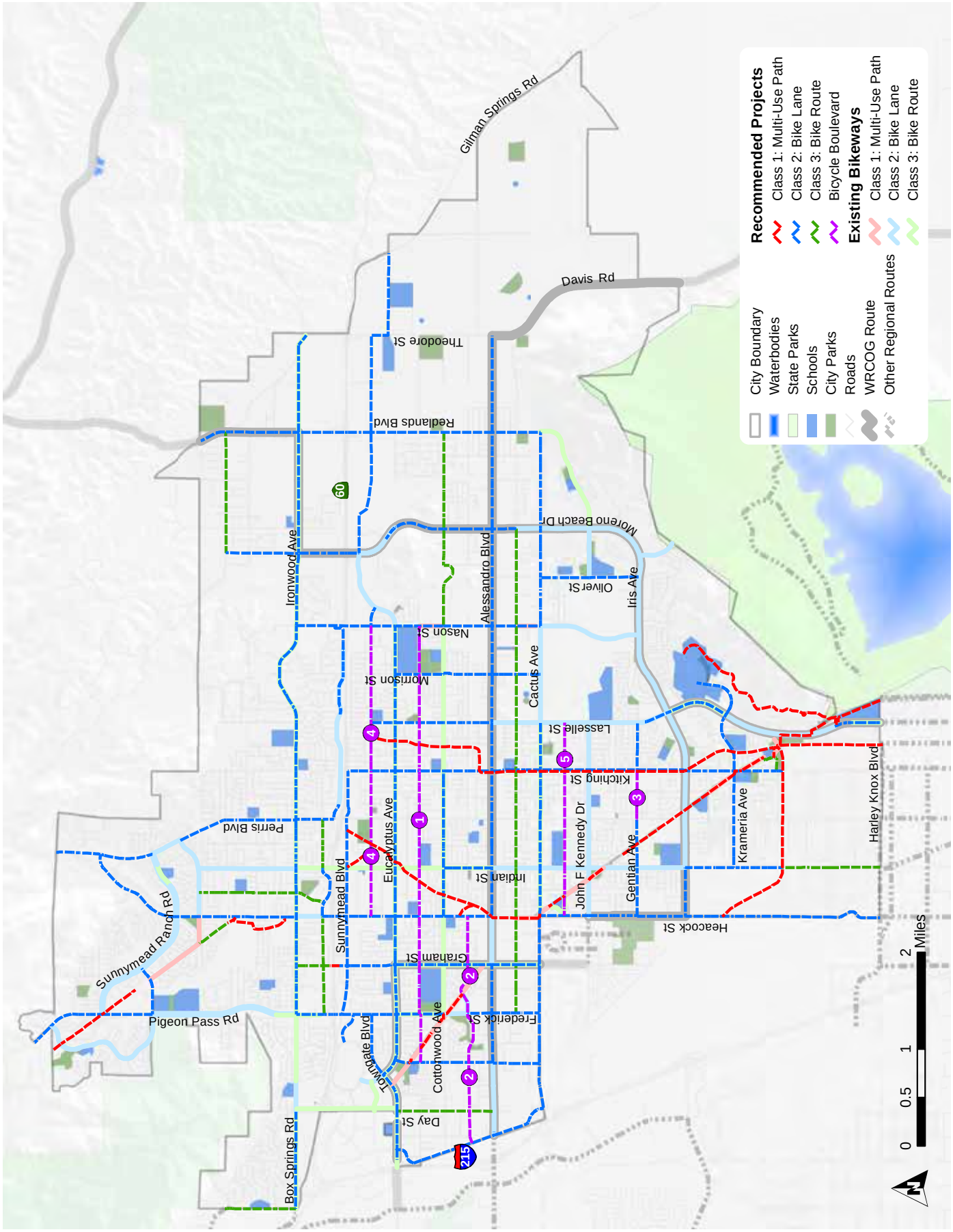


Table 15: Proposed Bicycle Boulevards

Rank	Length (Miles)	Facility	From	To	Existing Width (ft.)	On-street Parking	Notes
1	4.51	Dracaea Ave	Elsworth	Nason	44'	Yes	• Provide enhanced wayfinding at intersecting Class 1 path (Class 1; #3) • At Graham - enhanced crossing • At Running Deer - 4-way stop and yellow markings • At Indian - enhance existing 4-way crossing and 'T' NW corner of intersection • At Perris - enhanced crossing • At Kitching - enhanced crossing • At Lasselle - enhanced crossing • At Morrison - enhanced crossing • At Nason - green bike box
2	2.43	Bay Ave	I-215	Heacock	44'	Yes	• Several schools • Most signs already "flipped" • At I-215, median refuge to provide safe crossing between I-215 and Bay • At Ellsworth - use signage • At Frederick - use sensors/actuation and more prominent crosswalks • Past Frederick to Graham - use sharrows (too narrow for lanes) • At Heacock - green bike box
3	0.52	Gentian Ave	Perris	Kitching	44'	Yes	• Very short Bicycle Blvd connects what is otherwise Class 2 facility • Starts at Perris - include enhanced crossing and wayfinding there. • Ends at Kitching and would likely require bicycle/pedestrian bridge over Class 1, as well as enhanced crossing and wayfinding.
4	3	Fir Ave	Heacock	Nason	44'		• Connects to ball fields/schools • At Heacock - enhanced crossing • At Indian - enhanced crossing • At Perris - enhanced crossing • At two floodgate crossings - enhanced crossings • At Kitching - enhanced crossing • At floodgate - enhanced crossing • At Lasselle - enhanced crossing • At Morrison - enhanced crossing
5	1.99	Delphinium Ave	Heacock	Lasselle	44'		• Connects several schools and Juan Bautista de Anza Trail • At Lassell - enhanced crossing and median refuge • At Indian - enhanced crossing • At Perris - enhanced crossing • At Rio Bravo cul-de-sac - extension needed • At Class 1 - bridge needed • At Heacock - enhanced crossing

3.3 Future Opportunities

Based on City, County and public input, the following are long-term potential bicycle facilities that are generally a variety of project types that may hinge on future roadway development, adjacent jurisdictional actions, or legislative changes. Most represent connections with surrounding jurisdictions.

University of California Riverside (UCR)

A connection between Moreno Valley and the University of California Riverside (UCR) campus has been considered previously, including a specific plan over a decade ago. Several public meeting participants for this bicycle master plan suggested there is a continued need for a connection and that people are using this route. In fact, many cited the current, frequent use of an unimproved route along the railroad tracks to travel between Moreno Valley and the UCR campus. Anecdotal evidence also suggests that the northwestern area of Moreno Valley is becoming a preferred residential rental area for UCR students due to its proximity to the campus. Pending collaboration with the Southern California Regional Rail Authority (SCRRA), routing may employ adjacent rail right-of-way to provide a direct, low-stress route. Alternatively, routing may employ segments of Gernet Road and Watkins Drive.

Santa Ana River Trail

The aqueduct easement through the Sunnymead Ranch neighborhood of Moreno Valley is considered too steep for trail development. Instead, as part of a County proposed realignment of nearby Pidgeon Pass Road, the abandoned alignment may be retained as a trail route.

A route through this area is likely to continue northwest via Box Springs Mountain Park and the unincorporated Highgrove area, and is considered Moreno Valley's most direct connection with the Santa Ana River Trail, a major regional route. (At the time of this bicycle master plan, the County was preparing to develop a trails master plan for the Box Springs Canyon Mountain Park and vicinity.)

Redlands Boulevard

Redlands Boulevard entering Moreno Valley from the northeast is a planned WRCOG regional route. The County of Riverside is also proposing a trail separate but parallel with Redlands Boulevard along this segment.

Davis Road

Davis Road entering Moreno Valley from the southeast is a planned WRCOG regional route. The County has no plans for Davis Road, but supports its development as a trail route.

Lake Perris

The County strongly supports modifying the roadway around Lake Perris into a full loop around the lake since this would make it a much more desirable recreational, fitness and competitive route within easy reach of Moreno Valley.

Potential Cycle Tracks

The Governor signed Assembly Bill-1193 (Bikeways) in September 2014, which designates cycle tracks as an official bikeway type. Statewide guidelines are to be made available by January 1, 2016. The following routes were recommended for future cycle track consideration:

Alessandro Boulevard – Between Old 215 and Lasselle Street

Nason Street – Between Iris Avenue and Fir Avenue

Frederick Street – Between Alessandro and Sunnymead Boulevards

3.4 Improvements to Existing Facilities

Based on public input and field verification, the following are improvements recommended for existing bicycle facilities.

Multi-use Paths

Add distance markers. Also, along heavily used segments, a centerline stripe is recommended to identify right-of-way travel for all users.

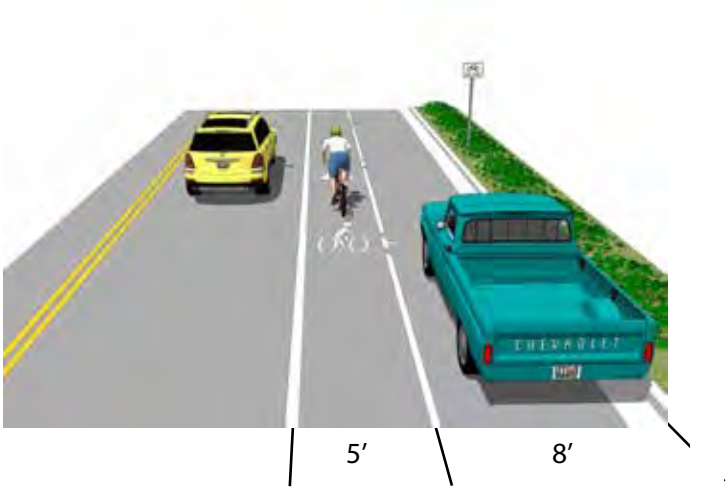
Bicycle Lanes

Whenever repaving projects occur, or repairs on streets with bicycle lanes, install bicycle detector loops or signal actuators.

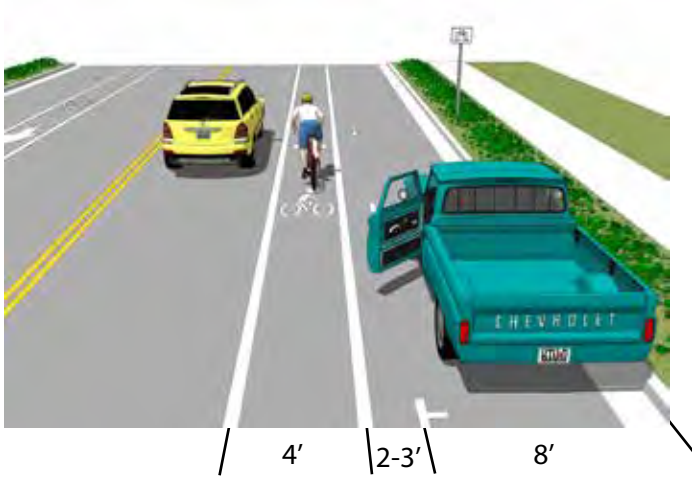
Wherever width is available, continue to add a buffer between the bicycle lane and parked cars or between adjacent travel lane and bicycle lane where on-street parking is not present.

Bicycle Routes

Add Shared Lane Markings or "Sharrows" to existing bicycle routes, particularly at transitions from bicycle lanes to shared travel lanes. Also install "Bikes May Use Full Lane" (CA MUTCD R4-11) signs along these routes.



Minimum standard width for bicycle lanes adjacent to on-street parking is five feet with eight foot parking stalls, for a total width of 13 feet. Lines on both sides of the bicycle lanes are recommended.



Where more than 13 feet is available, the extra space should be used for a buffer between the parking stalls and bicycle lanes. The bicycle lanes can be reduced to four feet minimum only when a buffer is provided between the bicycle lanes and parking stalls.

Bicycle Parking

Secure bicycle parking at likely destinations is an integral part of a bikeway network. Bicycle thefts are common and lack of secure parking is often cited as a reason people hesitate to ride a bicycle. The same consideration should be given to cyclists as to vehicle drivers, who expect convenient and secure parking at all destinations. Bicycle parking should be located in well-lit, secure locations close to the main entrance of a building, no further from the entrance than the closest automobile parking space. Bicycle parking should not interfere with pedestrian movement.

Bicycle racks should support the bicycle well and make it easy to secure it with a U-shaped lock through the bicycle's frame and the rack. The examples shown are a standard "inverted–U" rack and another art design rack that meets these criteria.

Adequate bicycle parking should be incorporated into any new development or redevelopment project. Bicycle parking should be given a balanced level of importance when considering car parking improvements or development. In commercial areas where bicycle traffic is more prevalent, as well as parks and shopping centers, increased bicycle parking is recommended. This provides an option for individuals who need to make a short trip to the local store to ride their bicycle rather than drive a car.

Increasing and providing secure bicycle parking will help promote and encourage kids to ride their bicycles to school if they know their bicycles will be safe. Bicycle parking should also be a standard amenity for existing and future parks.

Bicycle rack type plays a major role in the utilization of the bicycle racks. Only racks that support the bicycle at two points and allow convenient locking should be used. Racks that can secure the entire bicycle are preferred and recommended for installation in commercial areas, schools, parks and local businesses.

Custom racks that showcase local businesses may also be encouraged to improve aesthetics as long as the racks provide adequate security and reflect local context. For example, special districts may benefit from custom racks whose design aesthetic relates to other street furniture.

A successful bicycle rack design enables proper locking, which means the user must be able to secure a typically sized U-lock around the frame and one wheel to the locking area of the rack. Racks that support the bicycle, but either provide no way to lock the frame or require awkward lifting to enable locking, are not acceptable unless security is provided by other means, such as a locked enclosure or monitoring by attendants. See Appendix A and the Association of Pedestrian and Bicycle Professionals (APBP) *Bike Parking Guidelines* for more detailed information on bicycle parking design and placement.

Bicycle racks must be designed so that they:

- Do not bend wheels or damage other bicycle parts
- Accommodate high security U-shaped bicycle locks
- Accommodate securing the frame and wheels
- Do not trip pedestrians
- Are easily accessed yet protected from motor vehicles
- Are covered if users will leave their bicycles for long periods

To provide real security for the bicycle (with its potentially easily removed components) and accessories (lights, pump, tools and bags), either bicycle enclosures, lockers or a check-in service is required. Bicycle parking facilities are generally grouped into two classes:

Long-term - provides complete security and protection from weather. It is intended for situations where the bicycle is left unattended for long periods of time: apartments and condominium complexes, schools, places of employment and transit stops. These are usually lockers, cages or rooms in buildings.

Short-term - provides a means of locking the bicycle frame and wheels, but does not provide accessory and component security or weather protection unless covered. It is primarily for decentralized parking where bicycles are left for short periods of time and are visible and convenient to the building entrance.

To identify the number of bicycle parking at a specific land use, other cities have used various measurement methods such as a percentage of auto parking, unit count, proportion of building square footage and even building occupancy. There is a downside when determining bicycle parking spaces based on a percentage of vehicular parking spaces because when developments reduce the amount of parking spaces to create a more bicycle and pedestrian friendly environment, this reduction in the amount of vehicular parking also reduces the amount of bicycle parking. This then actually becomes a deterrent to increasing bicycle parking.

Determining bicycle parking demand is more appropriate when using the proportion of square footage or building occupancy. These units of measure are commonly used during plan check and can be easily integrated into the planning process.

The bicycle racks can be customized to incorporate an area's aesthetics, or designed to complement a specific building or business. For example, the City of Long Beach maintains a program funded by the American Recovery and Investment Act to help business owners install bicycle racks. Their program provides a range of rack designs, or business owners can provide their own custom designs.

Bicycle Corrals

Bicycle corrals are generally former vehicle parking stalls converted to bicycle parking. Most have been on-street conversions, but they are now being incorporated into shopping center parking lots as well. Corrals can accommodate up to 20 bicycles per former vehicle parking space. On-street bicycle corrals provide many benefits where bicycle use is high and/or growing:

- Businesses - Corrals provide a much higher customer to parking space ratio and advertise "bicycle friendliness." They also allow more outdoor seating for restaurants by moving the bicycle parking off the sidewalk. Some cities have instituted programs that allow local businesses to sponsor or adopt a bicycle corral to improve bicycle parking in front of their business.
- Pedestrians - Corrals clear the sidewalks and those installed at corners also serve as curb extensions.
- Cyclists - Corrals increase the visibility of cycling and greatly expand bicycle parking options.
- Vehicle drivers - Corrals improve visibility at intersections by preventing large vehicles from parking at street corners and blocking sight lines.

Especially where bicycle parking is very limited, an occasional parking space could be converted into a bicycle corral to increase the attraction of cycling to the commercial district instead of driving there. There is great variety in design including signage, protective barriers, curbs, custom paving or even simply striping.

In terms of placement, it is desirable to put bicycle corrals near intersections. Mid-block placement is not recommended because the corral can be hidden by parked motor vehicles, reducing visibility for both vehicle drivers and cyclists. Bicycle corral racks can be customized and have been designed and fabricated to complement specific locations, as well as available "off-the-shelf" designs sized to fit within a standard vehicle parking space. Refer to Appendix A: Design Guidelines and the APBP *Bike Parking Guidelines* for additional information.

3.5 Other Bicycle Facilities

Safe Routes to Transit

Best Practices in Bicycle Access to Transit

Integration of the bicycle master plan into the surrounding transportation and transit network improves the user experience by providing intuitive, safe and recognizable routes connecting active transportation and transit networks. Providing infrastructure for a broad range of users and mobility devices establishes a set of best practices for the development of a complete bicycle network master plan. The overarching goal of a bicycle master plan is to safely provide active transportation infrastructure to persons at all levels of cycling ability.

Improving bicycle access to transit helps to expand the sphere of influence for both cyclists and transit users, and can improve the transit rider and active transportation user relationship. A layered network enhancement of transit station area improvements allows for a connected multimodal transportation network. Improvements will be guided by a set of best practices as they apply to transit stops and stations, bicycle facilities and associated pedestrian improvements.

Transit Stop Improvements

Provide bus waiting areas with an improved level of comfort, encouraging transit use and creating a safer environment for users. Best practices include:

- Flush curb–to-bus boarding
- Ample seating spaces
- Shading
- Landscaping
- Lighting and public art where space permits

When feasible, include street furniture, trash cans and parking for mobility devices at transit stops.

Street side improvements at bus stations include dedicated bus-only lanes or bus pull-outs where transit stops offer direct bus access. Locate bus stops on the far-side of intersections where possible to ease pedestrian movement at intersections. Consider bus-only lanes or pull-outs near stops to prevent traffic congestion behind busses.

Bicycle Access Improvements

The improvement of access for bicycles to transit stations and stops should be centered around three overall goals:

- Decreasing the average travel time of cyclists accessing transit - This is achieved by decreasing wait times at intersections and by increasing speed and capacity along bicycle routes. Bicycle prioritized signal timing improvements decrease waiting times for cyclists and the provision of improved bicycle facilities increases the average users' speed.
- Decreasing point-to-point distances - This is achieved through the utilization of strategic short-cuts and increased street crossing opportunities. Off-street routes through utility easements and flood control channels or parks and mid-block crossings can be used to significantly reduce point to point distances.
- Supporting multi-modal transfer activity - Strengthen links between modal access points, such as bus stops and stations, or bicycle share kiosks and stations, by providing easily identifiable safe and efficient access routes between modes.

Modifying the allocation of street space near transit stations and stops is another key element in encouraging access to transit by bicycle. Elements include the following:

Reduced Lane Width

- Reduce vehicular lane widths, were possible, to help promote slower driving speeds, reduce the severity of vehicular crashes, and reduce crossing distances. Gain underutilized space for more transit-friendly uses, such as bus access, extended sidewalks, buffer-zones, protected bicycle lanes and bulb-outs.
- Where traffic volumes and bus usage permits, do not use lanes wider than 11 feet and ideally 10 feet. Use striping to channelize traffic and create buffer zones or delineate parking from travel lanes.
- Confirm lane width requirements for efficient operations.

Enhanced Bicycle Facilities

- Provide bicycle facilities separated and/or protected from vehicular traffic.
- Convert existing standard bicycle lanes or shared lanes into protected facilities where feasible, to protect cyclists from vehicular traffic.
- On streets with heavy traffic, multiple lanes, high parking turnover, double parking, and existing or potential high bicycle ridership, consider installing separated cycle tracks to protect cyclists and make cycling more comfortable and inviting to all users.
- On streets with high speeds, few driveways or cross streets and high demand for bicycle access, consider installing raised cycle tracks at the same level as the adjoining sidewalk.
- On streets where cyclists are already riding the wrong way, where direct access is very difficult for cyclists, where two way connections are needed, and where traffic is low-speed and low volume, consider installing contraflow bicycle lanes or routes that cut through blocks.
- Other protected facilities and bicycle enhancements recommended for transit zones can include buffered bicycle lanes, bicycle boxes, bicycle signal heads and bicycle signal detection.
- For separated facilities, use paint on the street surface to conform to bundled improvements.
- Consider signage, both directional and wayfinding.

Signal Modifications

- Slow vehicular speeds within transit zones.
- Give crossing priorities to pedestrians and cyclists.
- Time signals to ease traffic and minimize conflicts between pedestrians, cyclists and vehicles.
- Establish safe “transit zones” around major bus stops and transit station areas.
- Set vehicular signal timing for moderate progressive speeds, rather than aggressive speeds along bicycle routes.
- Time signals to provide pedestrians and cyclists lead time for crossing before vehicular travel.
- Use bus and bicycle detection at traffic signals for prioritization of bicycles.
- Add bicycle detection to traffic signals for crossings.

Bicycle Lanes

- Shift the balance of the roadway so that it caters more to cyclists of all types near major bus stops and transit station areas.
- Increase safety and comfort in the roadway for cyclists.
- Provide a passing lane for faster riders.
- Convert existing bicycle lanes into buffered bicycle lanes or cycle tracks within a quarter or half mile radius of the major bus stops or transit stations, where feasible. These facilities would be dedicated lanes, wider than standard bicycle lanes that welcome cyclists of varying speeds and abilities.
- Paint fast/slow indicators in the lane, giving ample room for passing at conflict points such as crosswalks and hills.
- Ideally provide buffers, such as painted, or raised planter, parking, or bollards, to comfortably separate cyclists from vehicular traffic.
- Incorporate informational signage, traffic markings, and dedicated signalization through intersections.
- At conflict zones, apply paint on streets.

3.6 Issues and Solutions

The following section describes typical bicycle safety issues, briefly discusses them and provides possible solutions. The graphic below and Table 16 illustrate issues that may be commonly experienced by regular cyclists. See Table 17 and the following pages for examples of possible solutions.

Figure 18: Typical Issues

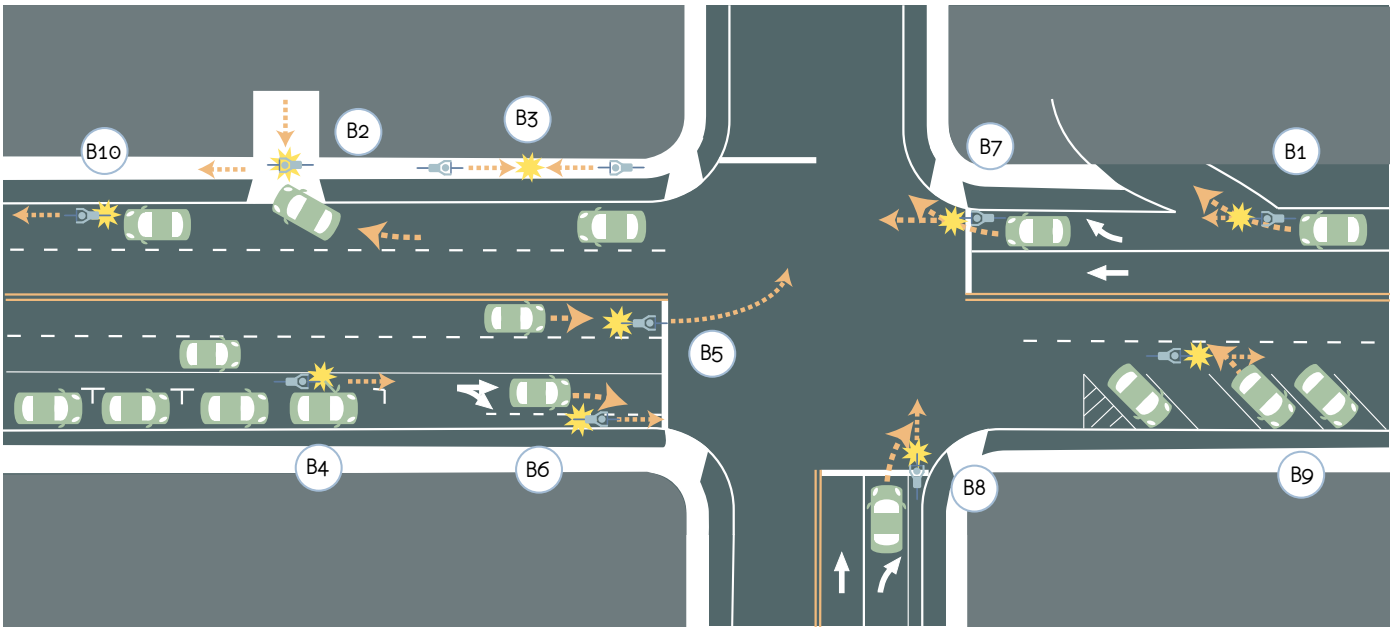


Table 16: Typical Issues

B1 - Crossing freeway on-ramps: Bicycle facilities that cross freeway on-ramps put cyclists in conflict with crossing traffic accelerating to highway speeds.	**1B, 8B, 9B**
B2 - Alley conflicts: Cyclists that use alleys for travel must be aware of visibility problems for drivers, pedestrians and other cyclists.	**1B, 2B**
B3 - Sidewalk conflicts: Cyclists riding on sidewalks may not be operating at pedestrian speeds and are at risk of collision with pedestrians and with vehicles at every driveway, intersection, alley and business entrance.	**1B, 2B, 3B, 14B**
B4 - Door zone: Cyclists riding adjacent to parallel parked vehicles can not be expected to ride closer than three feet to parked vehicles. They are at risk for being hit or running into an opening car door. This type of collision between a car door and a cyclist is often referred to as "dooring," and is especially hazardous because cyclists can be thrown into travel lane.	**4B**
B5 - Left turning conflicts: Cyclists needing to turn left must navigate their way to left turn lane (or left lane) are at risk for being hit because they are no longer where they are more likely to be seen.	**7B, 8B**
B6 - Right turning vehicles: Cyclists proceeding straight through intersection are at risk for being hit by right turning vehicles. This type of collision is often referred to as a "right hook."	**9B, 10B**
B7 - Right turn only lanes: Cyclists proceeding straight through an intersection are at risk for being hit by right turning vehicles. Bicycle lanes or shared lanes end before intersections without providing a facility to allow cyclists to continue through safely.	**9B, 11B, 12B**
B8 - Bicycle lanes improperly positioned at intersection: Bicycle lanes are installed to right of Right Turn Only Lanes. Cyclists proceeding straight through intersection are at risk for being hit by right turning vehicles. This type of collision referred to as a "right hook."	**9B, 11B**
B9 - Angled parking: Cyclists riding behind angled parking are vulnerable to being backed into due to impeded visibility from adjacent vehicles.	**10B**
B10 - Outside lane too narrow: Outside travel lane too narrow for bicycle lanes to be installed and to share with vehicles.	**1B, 4B, 8B, 13B**

Table 17: Potential Solutions

1B: Use caution, yield to slower users
2B: Ride in designated bicycle lanes, routes or streets
3B: Ride bicycle at pedestrian speed
4B: Mark proper lane placement with Shared Lane Markings or "Sharrows"
5B: Install a bicycle lane (6' preferred)
6B: If space is available, install 3' striped buffer between bicycle lanes and parking lane edge
7B: Install bike box
8B: Increase bicycle awareness signage, "Share the Road" or "Bikes May Use Full Lane" or "Shared Road"
9B: Add color to the bicycle lane at conflict points
10B: Install reverse angled head-out parking for improved sight lines and increased safety
11B: Install bicycle lanes between through travel and right-turn-only (RTL) lane
12B: Follow Caltrans MUTCD Figures 9C-4 and 9C-5
13B: Install Sharrows in through lane to direct cyclists through intersection
14B: Create districts where cycling is not allowed on sidewalks

1B) Sign and enforce appropriately when pedestrians and bicycles share sidewalks - Sacramento, CA

2B & 5B) Bicycle lanes on Pacific Coast Highway - Huntington Beach, CA

3B) Enforce reasonable cycling speed limits on facilities used by large numbers of pedestrians - Huntington Beach, CA

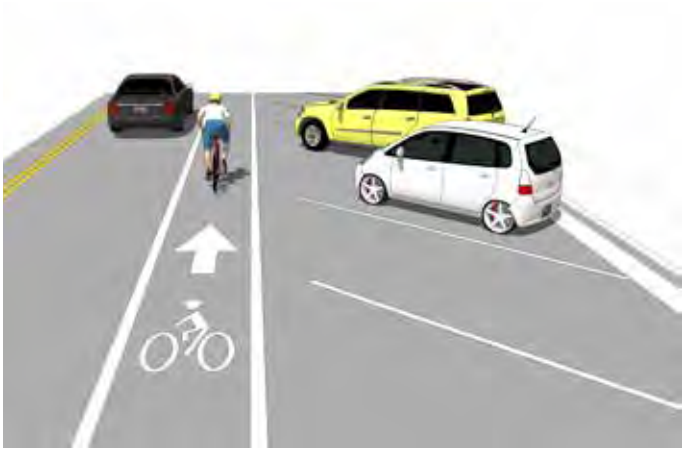
4B) Shared lane markings or "Sharrows" remind vehicle drivers to expect cyclists and help cyclists to properly place themselves within the roadway away from parked car doors. On streets with very high bicycle volumes, both purposes can be enhanced by supplementing markings with green paint - Oceanside and Long Beach, CA

6B) Buffering repurposes extra space from travel lanes to provide more distance between cyclists and vehicular parking or traffic. Extra space converted to buffering should be diagonally striped so it is not mistaken as a travel lane - Huntington Beach, CA

7B) Bike boxes are advanced stop bars for cyclists that provides them room to cue up in front of other vehicles waiting at a red light. While this treatment is still considered experimental, it is thought to increase cyclists' visibility, and therefore safety - Cambridge, MA

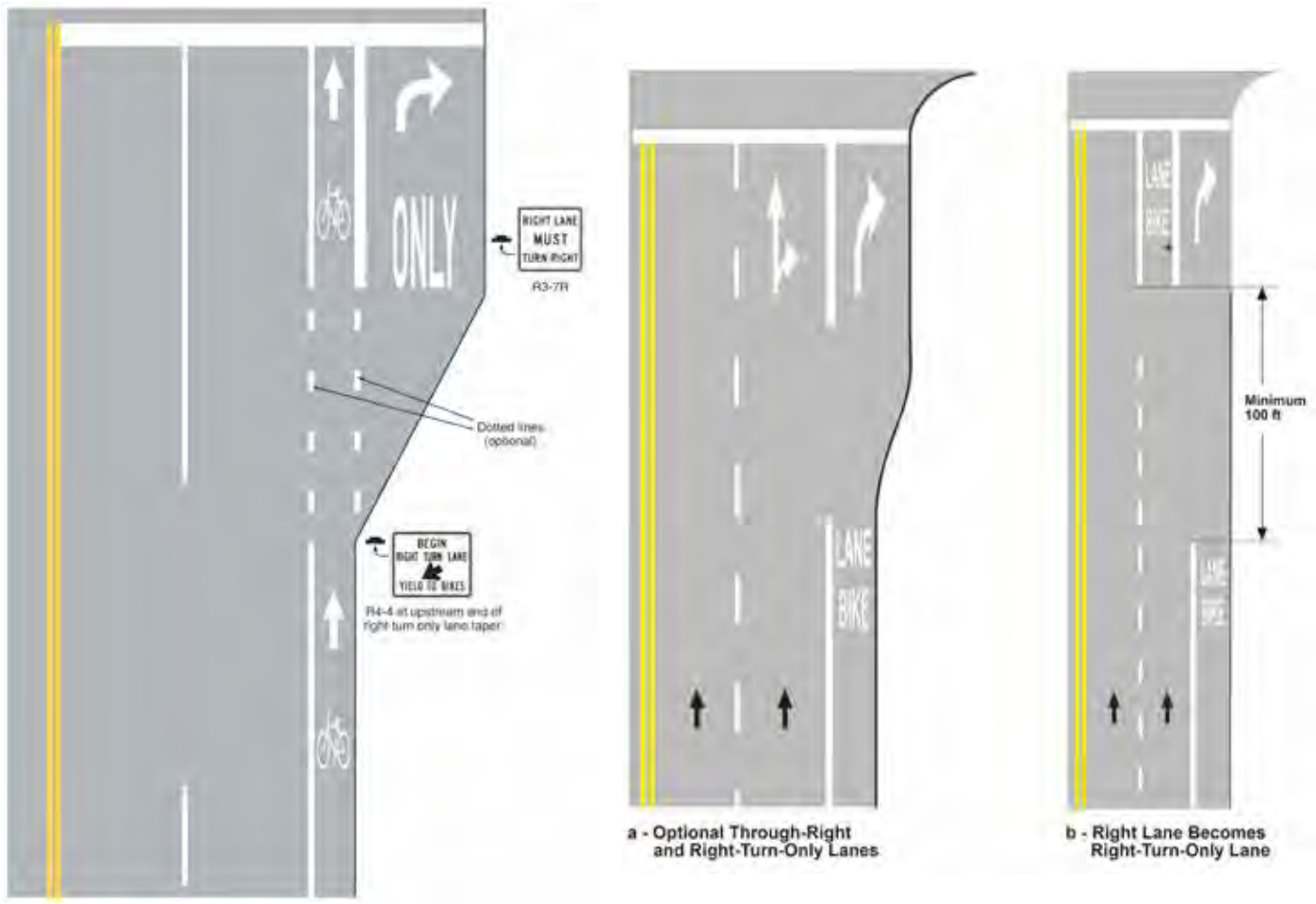
8B) Supplemental signage reminds vehicle drivers of bicycle traffic on the street - San Clemente, CA

9B) Color in the bicycle lane, especially in trasition zones where vehicle drivers must cross bicycle lanes, is a highly visible reminder to expect cyclists there - Seattle, WA



10B) Reverse angled parking greatly improves visibility of oncoming traffic, including cyclists, for vehicle drivers exiting parking stalls

11B) Bicycle lane properly installed between through travel lane and right-turn-only lane - Huntington Beach, CA



12B) Examples of Bicycle Lane Treatment at Right Turn Only Lane (2012 CA MUTCD)

13B) Shared lane marking directing cyclists through intersection - Philadelphia, PA

14B) Commercial district sign enforcing sidewalk policies - Coronado, CA

Bikeway Maintenance and Operations

Motor vehicle traffic tends to "sweep" debris like litter and broken glass toward the roadway edges where it can accumulate in bicycle lanes. Maneuvering to avoid such hazards can cause a cyclist to fall. In this way, proper maintenance directly affects safety and street sweeping must be a priority on roadways with bicycle facilities, especially in curb lanes and along the curbs themselves. Law enforcement can assist by requiring towing companies to fully clean up crash sites to prevent glass and debris from being left in place or simply swept to the curb or shoulder after collisions.

When any roadwork repairs are done by the City or other agencies, the roadway must be restored to satisfactory quality with particular attention to surface smoothness suitable for cycling. Striping must be restored to the prior markings, or new markings if called for in a project. Bicycles facilities also sometimes seem to "disappear" after roadway construction occurs. This can happen incrementally as paving repairs are made over time and are not promptly followed by proper re-striping. When combined with poor surface reconstruction following long periods out of service due to road work, bikeway facilities can be "lost," which can discourage cycling in general.

Construction projects that require the demolition and rebuilding of adjacent roadways can cause problems maintaining and restoring bikeway function. Construction activities controlled through permits, such as driveway, drainage and utility work, can have an important effect on roadway surface quality where cyclists operate in the form of mismatched pavement heights, rough surfaces or longitudinal gaps in adjoining pavements, or other pavement irregularities. Permit conditions should ensure that pavement foundation and surface treatments are restored to their pre-construction conditions, that no vertical irregularities will result and that no longitudinal cracks will develop. Strict specifications, standards and inspections designed to prevent these problems should be developed. A five year bond should be held to assure correction of any deterioration that might occur as a result of faulty reconstruction of the roadway surface.

Bicycle facilities should be swept regularly, at least twice a month, and preferably more often for heavily traveled routes. Also, adjacent shrubs and trees should be kept trimmed back to prevent encroachment into the pathway or obstructing cyclists' views.

3.7 Recommended Bicycle Programs

There has been a shift away from the traditional, compartmentalized "Five Es" approach developed by the League of American Bicyclists (Engineering, Education, Encouragement, Enforcement and Evaluation and Planning) and toward a more fully integrated and complementary menu of initiatives. By offering a menu rather than a prescriptive list, bicycle programming can more accurately address existing conditions and the desired outcomes of a given context. This approach allows for increased targeting of the "interested, but concerned" population of would-be cyclists and provides the greatest return on investment.

In addition to changes in the content and organization of bicycle programs, there has also been a shift in implementation strategies. Bicycle programs are increasingly targeted at specific project areas, often in conjunction with bicycle facility project construction. The implementation of a capital project represents a unique opportunity to promote a city's bicycle system and cycling as an attractive transportation option. According to the League of American Bicyclists', (Engineering) projects represent "*...the most visible and perhaps most tangible evidence of a great place for bicycling*" because new bicycle facilities attract the attention of cyclists and non-cyclists alike. They represent great opportunities to reach out to the "interested, but concerned" within the neighborhood. Effect on this target group will be strongest by directly linking facility improvements and supportive programs. In this way, bundling bicycle programs with projects represents a much higher return on investment for both.

The programs recommended for the City of Moreno Valley are organized as a menu of initiatives, each listed under a broad category:

- Education/Encouragement/Marketing
- Education/Enforcement
- Monitoring and Evaluation

These categories are not definitive. They are merely intended to offer some level of organization to the many program initiatives, the majority of which fall into more than one category.

Education/Encouragement/Marketing

1. Smart Trips Program Bundle

Smart Trips is a generic name for community-based transportation demand management (TDM) programs that provide tools and incentives to make cycling (and often walking, ride-sharing and transit) the preferred mode for particular trips. Traditionally, TDM programs are implemented as employer-based programs targeting the commute trip. Smart Trips are intended to complement efforts aimed at commute behavior by targeting other household trips. This is important because while many people find the prospect of commuting by bicycle daunting, they may be enticed to try riding for shorter trips around their neighborhood. Smart Trip programs have been shown to result in two to 14 percent reduction in drive-alone car trips and a significant increase in cycling.

Implementation of a variety of initiatives, leveraged as part of a Smart Trips program and delivered as a "bundle," has been important to the success of Smart Trips programs in other cities. The bundled delivery of Smart Trips initiatives (initiatives a-e, described below) allows for the saturation of a target audience within a target neighborhood and has been instrumental in maximizing limited outreach dollars.

a. Street Smarts Classes and Bicycle Ambassadors

This initiative promotes safe bicycling through community-based outreach, which helps bridge the gap between people who want to start riding and the availability of opportunities to help people learn to bicycle safely. Ideally, safety would be taught through bicycle safety courses delivered at the Cycling Education Center (described below) and on city streets, as appropriate. A Bicycle Ambassador program has recently been initiated by the Inland Empire Biking Alliance. The City should support this program through funding or, at least, in-kind contributions. While the Bicycle Ambassadors may serve the community at large, their impact would be greatest when working within neighborhoods targeted for Smart Trips program, where cycling facilities are planned. Bicycle Ambassadors could also offer great value in areas and among populations with a high latent demand for cycling and in areas with high collision rates.

Bicycle ambassador program logo - Ft. Collins, CO

b. Bicycle Friendly Businesses and Districts

The City can promote the League of American Bicyclists' (LAB) Bicycle Friendly Business program among local businesses to encourage cycling by their employees and customers. Businesses then use their bicycle friendliness as part of marketing. Benefits to employees often include attractive and secure bicycle parking, locker rooms, showers and reimbursement for trips made by bicycle, via the Bicycle Commuter Benefit Act. Under this Act, companies can reimburse employees on a tax-free basis for "reasonable expenses" incurred as a bicycle commuter. This can include the purchase of a bicycle and almost any type of accompanying equipment and accessories such as lights, racks and clothing, up to the annual limit of $240, or however much a company chooses to offer. Benefits to customers can include secure parking and discounts. Bicycle Friendly Business Districts combine the efforts of individual businesses to offer a more supportive and coherent cycling environment.

Application of this initiative would involve the promotion of Bicycle Friendly Business and District designation among businesses within the bikeway project areas and in conjunction with project implementation. A goal of this initiative would be establishing a scalable model for implementation for future bikeway projects within the City of Moreno Valley.

c. Community Bicycle Programs

Community bicycle programs, also known as Bike Kitchens, are commonly formed as grass roots initiatives by community members within low income and underserved communities to provide bicycles, helmets, maintenance and safety instruction to people as a means of expanding their transportation options and providing people better access to work and services. Existing Bike Kitchens serving communities surrounding Moreno Valley are Bike BBQ in Redlands, Loma Linda Bike Hospital in Loma Linda and Viva La Bike in Rancho Cucamonga.

The City of Moreno Valley should support the creation of a Bike Kitchen within its boundaries and leverage its resources in coordination with the bicycle facilities prioritized in the bicycle master plan. This combination will help to encourage an increase in cycling mode share, serve as a missing link in the public transit system, reduce GHG emissions and provide additional "green" jobs related to system management and maintenance. While it is likely infeasible to have a Bike Kitchen for each Smart Trips target area, any local Bike Kitchens and their resources should be marketed within those areas and directed towards target audiences.

d. Expand Traditional TDM – Employer Incentives

Existing TDM measures within the City of Moreno Valley include flexible work schedules, as well as Inland Empire Commuter Incentives offered by the Riverside County Transportation Commission (RCTC). Incentives offered are available to those switching from single occupancy vehicle trips to alternative modes and include both short-term and long-term perks ($2 per day for the first three months and premium coupon booklets for continuing participants, respectively). While the Commute Incentive program could certainly expand its offerings related to bicycle trips, this is largely beyond the purview of the City of Moreno Valley.

The City could, however, work with the RCTC and local major employers to expand the reach and marketing of its existing program. In addition to marketing to major employers, the City could deliver targeted marketing of available TDM benefits within Smart Trips target areas. The targeted marketing could be used to leverage participation in special challenges and competitions hosted by the City and regional planning agencies, such as Bike to Work/School Challenges). The City should also work with the RCTC to ensure the provision of appropriate TDM end-of-trip amenities for cycling like safe and secure bicycle parking and Safe Routes to Transit, particularly for bikeways identified by the bicycle master plan.

e. Events - Bike Month

Have the Mayor proclaim May as Bike Month and participate in Bike to Work Week events. Host pit stops during Bike to Work Weeks and Days. To increase encouragement, host Bike to Work days more often, such as monthly. Promote Bike Month or monthly Bike to Work days heavily within Smart Trips target areas and among target populations.

2. Safe Routes to School

a. Expand Moreno Valley's Safe Routes to School Program

Inactivity, and even obesity, among school-aged children is among the greatest public health crises in America. Encouraging children to walk or bicycle to school is one important means of combating this epidemic and has the potential to instill lifelong healthy habits. Successful Safe Routes to Schools (SRTS) programs not only provide encouragement and support for walking and cycling, but address legitimate safety concerns of many parents. SRTS programs tackle safety issues through education and infrastructure improvements. Wherever possible, SRTS efforts should be integrated into the larger processes of planning and project implementation.

Best practices in SRTS education programs combine more traditional print media and classroom tactics with experiential courses and clinics. For example, the Alameda County SRTS program provides an array of education and safety programs including Educator Guides, Skills Drills Bicycle Safety Course, Bicycle Clinics, Bicycle Safety Certification Program and Bikemobile, a mobile repair clinic (*http://alamedacountysr2s.org/*).

Ideally, Moreno Valley's existing SRTS program could partner with a Traffic Garden (see Section 3.a.) to offer more comprehensive traffic safety education, teaching children the fundamental rules and responsibilities of all modes. Participating schools could make attendance for field trips to the Traffic Garden compulsory and recurring, a component of Physical Education, with activities tailored to age groups. Barring the availability of a Traffic Garden, a makeshift streetscape could be created with chalk, for example. Supplemental exercises in the mechanics of actually riding a bike, from basic to advanced bicycle handling skills, could be provided as needed at the Cycling Education Center.

SRTS efforts at infrastructure improvement are unique in their incorporation of youth perspectives. Youth are encouraged to participate at all phases and even to serve as a Safe Routes to School liaison. Though Moreno Valley already has a SRTS program, further funding may be available through additional Safe Routes to Schools Grants, available at both the federal and State level. This funding can be used for a variety of activities including site-specific evaluation and planning, infrastructure costs and education programs. Assistance with funding applications and program facilitation is available from local non-profits. More information can be found at: *http://www.saferoutesinfo.org*.

b. Promote the Walking School Bus and Bicycle Train

These are volunteer-based programs in which children are chaperoned by adults as in they walk or bicycle to school. Parents often cite safety issues for their reluctance to allow their children to walk or ride to school. Providing adult supervision may help reduce those worries for families who live within walking or bicycling distance to school. The Temecula Bike Train, led by Inland Empire Biking Alliance Board Mem-

Bike to School event with police officer - Phoenix, AZ

ber Zak Schwank, is one highly successful Riverside County example. This Bike Train occurs every Friday with 25 to 100 schoolchildren. Moreno Valley can start with one school as a pilot program and expand to other school if there is demand. These programs and volunteer efforts require coordination and potential attention to other issues, such as safety training and liability. These efforts can coincide with other educational programs such as visits to the Traffic Garden and should be highlighted in conjunction with any project implementation in the area (*https://www.facebook.com/BikeTrain)*.

c. Participate in Walk and Bike to School Day

This one-day October event in more than 40 countries celebrates the many benefits of safely walking and cycling to school. Walking and rolling to school embodies the two main goals of First Lady Michelle Obama's Let's Move! Campaign: to increase children's physical activity and to empower parents to make these kinds of healthy choices. The National Center for Safe Routes to School, which serves as the clearinghouse for the federal Safe Routes to School (SRTS) program, coordinates online registration efforts and provides technical support and resources for Walk to School Day. For more information, go to *www.walktoschool.org*.

Implement the Boltage Program at Schools

This program's goal is to increase the number of children regularly riding or walking to school using advanced technology to count and provide incentives. A solar-powered, Radio Frequency ID (RFID) tag reader called a Zap machine automatically registers RFID tags attached to backpacks or helmets. As they pass, the Zap machine registers the number of times children ride or walk to school and securely uploads the data to the Boltage web site so children can see how close they are to earning a prize. The Boltage program is not a competition, but simply an encouragement to get children to ride their bikes or walk to school more often. For more information on pricing and funding this program, go to www.boltage.org.

3. Cycling Education Center

Create a Cycling Education Center at the Civic Center Campus adjacent to City Hall and the Conference and Recreation Center. The Center would serve as a clearinghouse for cycling educational materials, electronic and printed, and host a variety of courses. Course material would be bicycle-specific and, in the case of the Traffic Garden (described below), cover general mobility. Bicycle-specific areas would include:

- Handling skills (balance, starting, maneuvering, stopping)
- Riding in traffic skills (riding predictably, signaling, merging, obeying applicable laws)
- Safety gear (helmets, lights, visible clothing)
- Other (basic maintenance, locking your bicycle)

The Civic Center Campus, with a substantial amount of unused brown-field land and its proximity to several compatible existing and future land uses, would serve as a logical umbrella organization for the cycling education center. Important existing facilities include schools, parks and other civic facilities. Important future facilities include the impending Metrolink transit station and the improved bicycle facilities proposed by this plan. The proximity of a Cycling Education Center to these uses represents a more integrated approach to bicycle programming, where facilities provide opportunities for education and where education enhances use of those facilities. The Center's proximity to many Moreno Valley schools would facilitate its use, as well as to several improved cycling facilities, including the yet-to-be-connected Aqueduct Trail. This type of synergistic land use not only allows for real world educational opportunities, but also promotion of the bicycle network and a better return on the City's investments.

Teaching skills courses will require the training of licensed cycling instructors. The training for League of American Bicyclists Cycling Instructors is done in groups as needed when the number of interested cyclists reaches a minimum number. The City, local bicycle club or the Bicycle Advisory Committee must coordinate efforts to gather interest from the Police Department, Engineering and Planning Departments, local volunteers, advocates and cyclists. In the case of a Traffic Garden, detailed knowledge of laws related to all modes would be required. For this reason, the City's designated law enforcement liaison (Initiative 9) may be the most suitable referee.

a. Build and Operate a Traffic Garden

Traffic Gardens are mini-streetscapes where elementary-age children operate pedal-powered vehicles. The goal is to teach them how to be responsible roadway users. They have been a fixture in European cities for decades and exist in several US cities as "Safety Towns." Traffic Gardens are usually owned by their host cities and centrally located and the city's schoolchildren take regular field trips to it. Once there, they all assume various roadway-user roles and are accordingly assigned different privileges and responsibilities. A big part of the appeal of this educational tool, especially for children, is the game aspect.

The game is based on the hierarchy of roadway users, where ambulances have top priority, followed by police vehicles, transit, cars/bikes and pedestrians. Everyone wants to drive the ambulance because it is the most powerful. No one wants to be a pedestrian. A police officer or school official stands watch over the children with a megaphone. If someone makes a poor decision or acts irresponsibly, they are called out and demoted, having to work their way back up the hierarchy. Children learn that they must earn their right to operate a vehicle and that, if they behave poorly, they will have that privilege taken away immediately and publicly.

While this tool is traditionally reserved for young children, it could just as easily be used to educate adults, particularly those charged with traffic violations. The recent proliferation of new pedestrian and bicycle facility types, such as bicycle boulevards, shared lanes, HAWK pedestrian crossings, etc., without adequate education increases the chance of violations by even conscientious roadway users.

Traffic Gardens are a powerful educational tool because they are experiential and they require participants to experience the roadway through all modes. Education efforts aimed at understanding the "other" modes would be far less necessary if everyone used each mode from time to time. Barring this reality, Traffic Gardens offer a great simulation. The 2009 International Scan Team, a federally-sponsored delegation of pedestrian and bicycle professionals, was so impressed with Traffic Gardens they included them in their official policy recommendations.

Dutch traffic garden

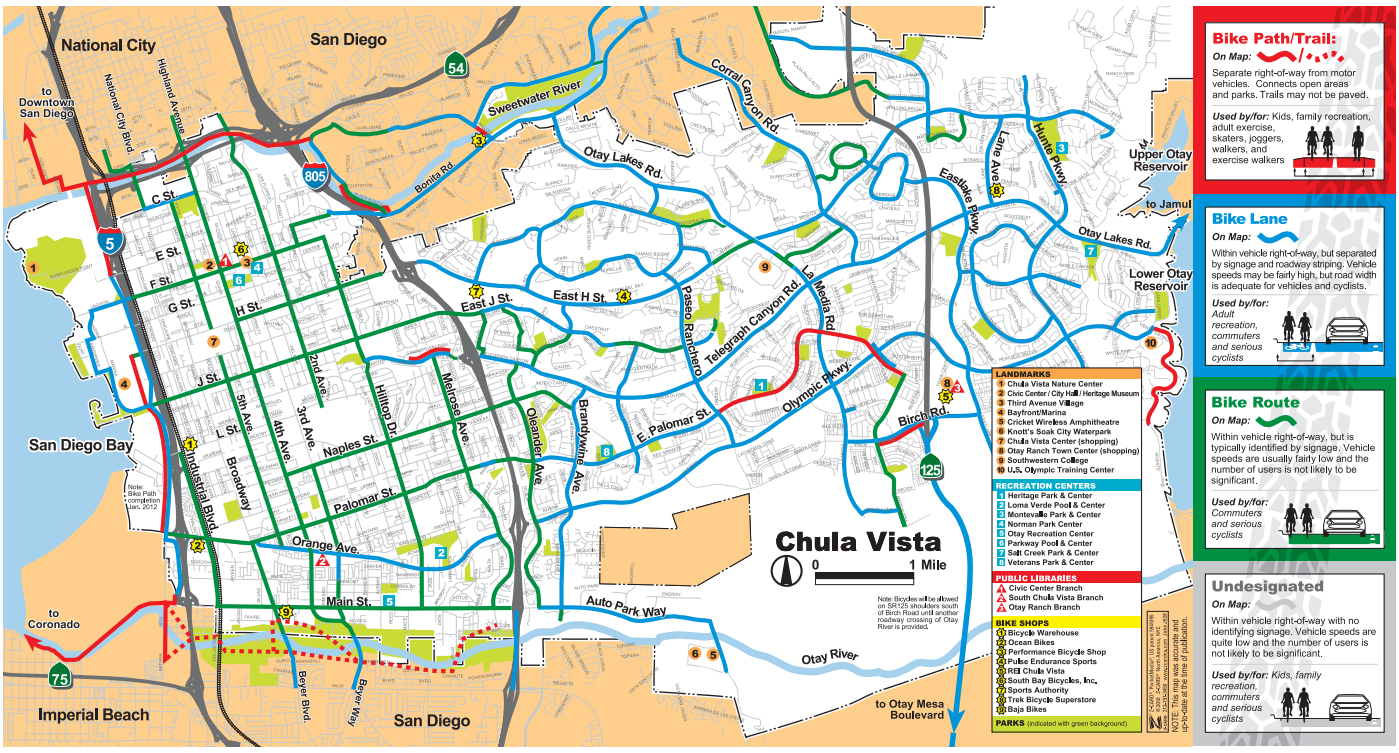
Washington Area Bicyclists Association traffic garden - Washington, DC

4. Maps and Signage

a. Produce an Updated Bicycle Facility Map

The bicycle system, built and planned, could be promoted through a publicity campaign and a user-friendly map that illustrates available utilitarian and recreational routes and their connection to regional routes. In addition to route location and distances, this map should include other essential information such as key destinations and rules of the road. While bicycle maps have traditionally included designations of facility type (Class 1, 2 and 3), the utility of this for the general public is increasingly questioned. Instead, information more directly related to preferred user experience, such as topography, traffic stress, the scenic or direct quality of a route, which varies from user to user, is seen as valuable.

The flip side of the map is an excellent place to locate education materials and sponsorship information. If printing costs are prohibitive, seeking funding though grants and sponsorship is recommended. The cartography and graphic design work of the map may be taken on by students of a local GIS or design class. The map should be made available in both hardcopy and digital format, with the latter available for download via the City website. Lastly, it is critical to update the map as new bicycle facilities are implemented or facilities are changed.



Example bicycle system map (http://www.chulavistaca.gov/clean/conservation/climate/alternative.asp)

Zmap Folding Maps

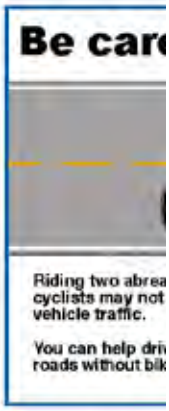
This is a proprietary folding map technology that allows users to quickly unfold and refold a map into an easy-to-carry pocket size package between cardstock covers.

SHARING THE ROAD SAFELY

Please take a moment to read through these tips to learn more about cycling safely in Oceanside.

Be polite and be smart. Show respect for all road users and you'll get respect in return.

Remember: Cyclists and drivers share the same roads, have the same rights and responsibilities, and must follow the same rules.



Portion of example educational graphics from reverse side of bicycle system map (http://www.ci.oceanside.ca.us/civica/filebank/blobdload.asp?BlobID=23013)

b. Partner with Google to Proved Better Bicycle Directions

Consistent with the effort to make cycling an easy choice for a broad range of people, bicycle maps should "break out of the cyclist silo" and become an integrated component of general mobility wayfinding. Google Maps is chief among general wayfinding applications, and currently includes the option of selecting bicycling for travel directions, but is limited in its utility. While driving directions and transit directions include a menu of options for preferred user experience ("avoid highways, avoid tolls, shortest travel time, fewest connections, etc."), there are none for cycling. As suggested previously, tailored cycling directions, based on preferred user experience, offer the greatest value to the range of people who cycle. Moreno Valley may choose to share data generated for this bicycle master plan, such as stress level, network connectivity, etc., with Google to improve the interface and to promote cycling. This pilot project could serve to catalyze a nationwide upgrade of Google Maps.

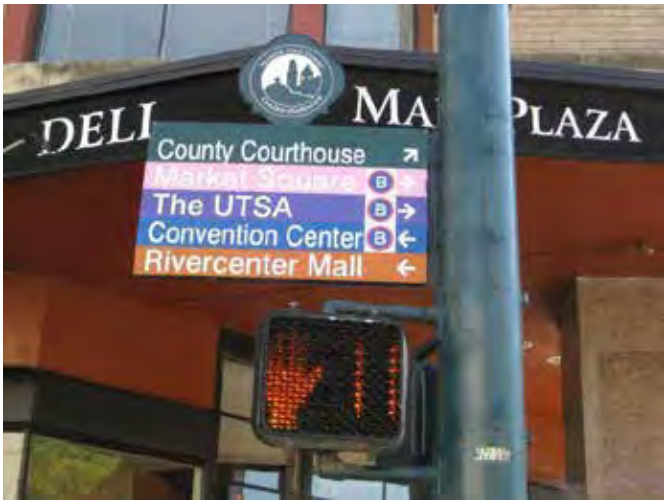
c. Develop and Implement a Wayfinding System

Directional signage allows new cyclists and tourists alike to find their way to their destination or nearby landmark via a recommended route. Wayfinding signage directs people and provides information about destinations, directions and/or distances. A highly legible and well-executed wayfinding system has the potential to increase comfort and safety, through even diverse and chaotic environments. Wayfinding systems can also achieve community objectives, such as the promotion of a local attractions and the resultant benefit of economic development. When applied on a regional level, wayfinding can link adjacent communities.

People are the single most important component in developing a wayfinding strategy. Public input on preferred routes, important destinations and the signage itself has proven invaluable. In designing a wayfinding strategy or system, the following questions need to be considered:

- What user types are likely to use the wayfinding system?
- Where are these users going?
- What do the users or visitors want to see and hear?
- What is the primary goal: navigation, directional information, orientation, location information, or interpretation?
- Is a clear message being sent by the signage?
- Based on the expected user types, what are the safest or most logical paths or routes?

Street/bicycle boulevard signage - Vancouver, B.C.



Bicycle wayfinding signage - San Antonio, TX

There is considerable variation in wayfinding signage legibility and utility. Wayfinding system development for Moreno Valley should begin with a thorough examination of best practices and should conclude with a clear set of guidelines related to actual signage design and design of the signage system.

Bicycle wayfinding sign - Portland , OR

d. Install Advisory Signage along Popular Routes

Alert drivers to the presence of cyclists, particularly on a shared facility, or where there is no dedicated bicycle facility. The message should serve to both advise motorists and legitimize the presence of cyclists. Cycling is an important component of the transportation system and should be respected by other modes. While the "Bikes May Use Full Lane" Sign (R4-11) is commonly accepted and generally conveys the intended message, current discourse suggests the use of stronger language ("Shared Road") – and accompanying education – where appropriate. This phrasing is powerful because it is a statement of fact and implies legal consequence for violators, whereas "Bikes May Use Full Lane" and "Share the Road" sound more like pleading cautions. Regardless of the exact language used, this type of sign should accompany any Shared Lane Markings used. Ample education and marketing should be provided to explain all new signage.

5. Professional Development

Develop or facilitate the development of an Active Transportation Professional Development program for the Riverside County region. The program would be oriented toward professionals, advocates, and the members of the public who wish to further their education in bicycle and pedestrian planning and design. Professional affiliations to target for the program include engineers, planners, bicycle advisory committees, health professionals, teachers and school administrators and law enforcement.

Program coursework could provide continuing education units (CEUs) to some professionals. The curriculum could include the following courses:

- Transportation Planning
- Bicycle Data Capture and Analysis
- Bicycle Planning
- Bicycle Facility Design
- Pedestrian Data Capture and Analysis
- Pedestrian Planning
- Pedestrian Facility Design
- Best Practices in Active Transportation Policies
- Instituting "Complete Streets" and "Routine Accommodation" Policies

The program could be developed in a largely self-sufficient manner, with student fees covering a majority of the costs.

6. Marketing Campaigns

Build awareness and general appeal of cycling as a safe and common mode of transportation. Marketing is about more than advertising. Communication and promotion play important roles. To get people to see cycling as a desirable mode choice, and to pay attention to safety, they must be engaged through effective marketing. More engaged people will lead to more people riding bicycles and it will lead to more aware cyclists, drivers and pedestrians and more people who care about bicycle safety.

Typical marketing campaigns, especially those initiated by government agencies, tend to be too information-laden and uninspiring. Lessons from the field of marketing point to the proven effectiveness of positive messages that inspire people and get out more to ride. The objective is not to get everybody to ride bicycles all of the time, but rather to target those most ready to change.

Bicycle safety campaign posters - San Francisco and Pittsburgh, PA

Messages should inspire people to move from "might" to "sometimes" and from "sometimes" to "often." For example, a targeted message might be one directed at people who currently solely ride for recreation and have never considered a short errand trip within their neighborhood, but would be open to the suggestion. Good marketing would make that suggestion and inspire people in that market segment to try cycling in their neighborhood for short errands. Other messages might target the market of people ready to improve their riding techniques or even those who may never ride, but who might be encouraged to treat cyclists with more care and civility.

"Share the Road" banner - Newport Beach, CA

7. Host a Ciclovia and Other Signature Events

A Ciclovía (also ciclovia or cyclovia in English) is a Spanish word that translates into "bicycle path" and is used to describe either a permanently designated bicycle route or a temporary event where the street is closed to vehicles for use by people and non-motorized transportation. Ciclovia events are celebrations of livable streets and communities, encouraging citizens and businesses to get out in the street and enjoy their city through active participation. While Bogotá, Colombia is often credited with starting ciclovias, they have gained considerable popularity in the United States in the past five years.

While all Ciclovia events are alike in their creation of a people-oriented, car-free space, they are otherwise unique. In some cities, the event occurs once or twice a year, while in others it occurs every Saturday or Sunday throughout the entire summer. Some cities re-use routes, while others, like Portland and Chicago, host the events in different locations around the city each weekend. Some routes form a circuitous route, while others are linear. Most include parks or other open public spaces. Most include music, performance, games and other activities, some of which is scripted and some spontaneous. Ciclovias often have a theme of health, exercise and active transportation and include groups promoting free, healthy activities stationed along the route. Ciclovia routes can incorporate and highlight new bikeways and preferred routes, encouraging their use and maximizing investment.

In addition to Ciclovias, the City can promote cycling through more sport-oriented events such as road and cyclocross rides and races. By joining forces with a local bicycle coalition (Inland Empire Biking Alliance or IEBA) or club, the City can maximize resources and participation. The City and the IEBA did just this for their inaugural "Ride MoVal" event in the fall of 2013. The event consisted of four routes, ranging in distance from five miles to a metric century (62 miles), with proceeds directed to Moreno Valley Unified School District sports programs. Organizers plan on making it an annual event along with a possible cyclocross race series.

Events focused on the sport of cycling are important because they promote cycling and people who cycle for recreation may consider cycling for everyday, utilitarian trips. The very act of cycling, of course, carries important co-benefits of health and wellness, but utilitarian cycling provides additional benefits associated with converting vehicle trips to cycling trips such as cleaner air, increased savings (for both cyclists and the local government) and increased stimulation of the local economy.

Ciclovia events (CicLAvia) - Los Angeles, CA

Ride MoVal event - Moreno Valley, CA

Education/Enforcement

8. Educate All Police Department Staff Regarding Cycling Issues and concerns

If the ultimate aim is to promote cycling as a legitimate form of transportation, all officers should receive some form of bicycle training and should be offered LCI training, if possible.

Police bicycle patrol - Easley, SC

9. Designate a Law Enforcement Liaison Responsible for Cycling Issues and Concerns

This liaison would be the main contact for Moreno Valley residents concerning bicycle-related incidents. This liaison would perform the important function of communication between law enforcement and cyclists. The liaison would be in charge of the supplemental education of fellow officers regarding bicycling rules, etiquette and behavior. The liaison could be the same person as the referee for the Traffic Garden and should be LCI certified, as well as ride a bicycle while on duty, as appropriate. Allocate funding for the training and support of this duty, as well as for necessary bicycle equipment.

10. Targeted Enforcement

The Moreno Valley Police Department uses targeted enforcement to educate motorists and cyclists about applicable traffic laws and the need to share the road. These efforts are an effective way to expand motorist and cyclist education. Targeted enforcement should be expanded to warn and educate motorists and cyclists about laws, rules of the road and safety procedures. This could be in the form of a brochure or tip card explaining each user's rights and responsibilities. Targeted enforcement may help mitigate the following traffic safety problems:

- Speeding in school zones
- Illegal passing of school busses
- Parking violations – bus zone, crosswalks, residential driveways, time zones
- Risks to cyclists during drop-off and pick-up times
- Lack of safety patrol/crossing guard operations
- Unsafe cycling practices
- Other school zone traffic law violations

This approach has been successful in Los Angeles where four officers, one for each Police Department Traffic Division, have been dedicated solely to bicycle safety and outreach. Locally, the Riverside County Sheriff's Department garnered national attention with its "Gingerbread Man" crossing enforcement sting program. Its purpose is to educate drivers about the crosswalk laws and to make them more aware of the dangers of speeding and inattention, especially near schools. *(http://blog.pe.com/breaking-news/2013/09/26/moreno-valley-gingerbread-man-helps-nab-crosswalk-violators/)*

11. Institute a Mobility Safety Program

Under this program, when stopping adult motorists, cyclists and pedestrians for minor traffic violations, law enforcement officers have the ability to issue an Adult Mobility Citation in lieu of a regular Traffic Citation. Under this program, individuals are offered two choices. They can either contest or ignore the citation, in which case it is forwarded to the courts and treated as a normal traffic citation, or they can attend a Mobility Safety Program to have the citation waived. A Mobility Safety Program should be conducted for a specific number of hours and be designed to decrease traffic collisions and encourage safe behavior for all modes.

12. Distribute Lights and Helmets to Cyclists

If law enforcement officers observe a cyclist riding at night without the proper reflectors or lights, they may give the cyclist a light along with a note or friendly reminder about the light requirement and its importance. This provides a positive and educational interaction rather than a punitive one. This program could be funded through a safety-oriented grant. Many cities have targeted the end of daylight savings as an ideal time to perform this function.

Helmet giveaway programs are another opportunity for positive education and interaction. Law enforcement departments have conducted public events to hand out helmets, as well as distributing them in the community during the course of patrol when an officer sees a child riding helmetless.

Riverside County Sheriff traffic enforcement - Moreno Valley, CA

Helmet giveaway - San Diego, CA

Monitoring and Evaluation

13. Create City Staff Bicycle Coordinator Position

The creation of a Bicycle Coordinator position would demonstrate the City's commitment to cycling and "Complete Streets." A bicycle coordinator or program manager can help coordinate between City departments to ensure projects planning consistency and cooperation. A bicycle coordinator would manage programs and implement projects listed in the bicycle master plan, and would be responsible for updating the plan in a timely manner. This includes maintaining a prioritized list of improvements, updating cost estimates and identifying appropriate funding sources. This investment in staff is often returned since this position usually is responsible for securing State and federal funding for bicycle projects.

14. Bicycle Pedestrian Advisory Committee

A Bicycle Advisory Committee (BAC) assists the City with implementation of plan projects, policies and programs. The BAC allows City staff, volunteers and bicycle advocates to continue efforts to improve cycling throughout the City. This group acts as a community liaison and addresses issues concerning local cycling. The BAC can review the implementation and regularly evaluate the progress of improvements in the Bicycle Master Plan. City support is imperative for creating the committee, budgeting time and resources for City staff and elected officials to attend and to support these meetings. Some cities have developed bicycle and pedestrian or active transportation advisory committees.

15. Count Cyclists and Review Collision Data

Conduct regular cyclist counts throughout the City to determine baseline mode share and subsequent changes. Gathering cyclist counts would allow the City to collect information on where the most cycling occurs. This assists in prioritizing and justifying projects when funding is solicited and received. Counts can also be used to study cycling trends throughout the City. Analysis that could be conducted includes:

- Changes in volumes before and after projects have been implemented
- Prioritization of local and regional projects
- Research on clean air change with increased bicycle use

Counts should be conducted at the same locations and at the same times every year. Conducting counts during different seasons within the year may be beneficial to understanding the differences in bicycle traffic volumes based on weather. In addition, bicycle counts should be collected as part of any existing traffic counts. Results of the number of cyclists should be regularly recorded for inclusion in the bicycle report card (See section 17).

The Moreno Valley Police Department should continue to collect and track collision data. Regular reports of traffic collisions should be presented at the Bicycle Advisory Committee. Traffic collisions involving cyclists could be reviewed and analyzed regularly to develop plans to reduce their frequency and severity. Any such plans should include Police Department involvement and should be monitored to determine their effectiveness. Results of the number of bicycle-related traffic collisions should be recorded in the bicycle report card.

16. Law Enforcement Referral Process

Design a communication process that encourages students and parents to notify the school and police of the occurrence of a crash or near-miss during school commute trips involving auto, bus, pedestrian or bicycle transportation. Include not only the Police Department, but also the Traffic Safety Commission, the Planning Department and SRTS stakeholders in this reporting system to help better use data generated. Enlist the help of law enforcement with a number of traffic safety duties:

- Enforcement of traffic and parking laws through citations and warnings.
- Targeted enforcement of problem areas – an intensive, focused effort during the first two weeks of school, as well as a strategy for the rest of the year.
- Participation in traffic safety programs: Traffic Garden, SRTS Task Force, etc.

Los Angeles has a successful program called the LA Bike Map that allows cyclists to submit incidents, see them displayed instantly, and study the overall pattern, dynamically, in one place.

17. Develop a Bicycle Report Card

The City could develop a bicycle report card, a checklist used to measure the success of plan implementation, as well as effort made, within the City. The report card could be used to identify the magnitude of accomplishments in the previous year and general trends. The bicycle report card could include, but not be limited to, keeping track of system completion, user counts and bicycle related collisions.

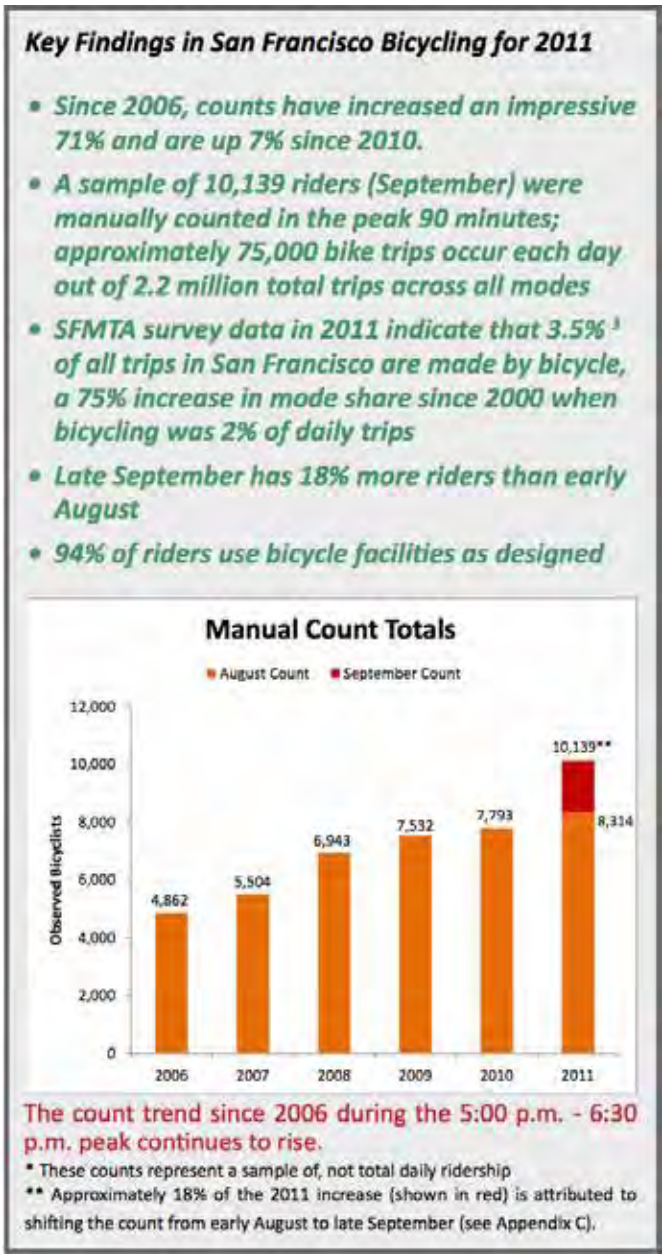
The City can use the report card to track trends, placing more value on relative than absolute gains (in system completion, mode share and safety). For example, an upward trend in travel by bicycle would be viewed as a success, regardless of the specific increase in the number of cyclists. Safety should be considered relative to the increase in cyclists. Sometimes crash numbers go up simply because cycling increases, at least initially. Instead, measure crashes as a percentage of an estimated overall mode share count.

A major portion of the bicycle report card would be an evaluation of system completion. An upward trend would indicate that the City is progressing in its efforts to complete the bicycle network identified in this document. The report card could be developed to utilize information collected as part of annual and on-going evaluations, as discussed in the previous sections. The report card is not intended to be an additional task for City staff, but rather a means of documenting and publicizing the City's efforts related to bicycle planning. If a Bicycle Advisory Committee is appointed, it can be a task of the committee to review the report cards and adjust future plans and goals accordingly.

In addition to quantifying accomplishments related to the bicycle plan, the City should strive to quantify its efforts. These may be quantified as money spent, staff hours devoted or other in-kind contributions. The quantified effort should be submitted as a component of the bicycle report card. Some cities publish their bicycle report cards online.

18. Apply for Bicycle Friendly Community/ Neighborhood Designation

Bicycle Friendly Community/Neighborhood Designation is part of an official program offered by the League of American Bicyclists intended to provide communities with guidance on becoming more bicycle friendly and to offer recognition for their achievements. Like the report card described above, applying for Bicycle Friendly Community/Neighborhood Designation provides a standard by which Moreno Valley can measure its progress. From the LAB's own website:



Bicycle Report Card excerpt - San Francisco MTA

> *"The Bicycle Friendly Community (BFC) program provides a roadmap to improve conditions for bicycling and the guidance to make your distinct vision for a better, bikeable community a reality. A community recognized by the League as Bicycle Friendly welcomes bicyclists by providing safe accommodation for cycling and encouraging people to bike for transportation and recreation."*

4 Bikeway Funding

4.1 Cost Estimates

The proposed bicycle facilities support the goal of improving connectivity and generally expanding the dedicated bicycle network. Cost estimates were developed based on recent construction bid results in California. All costs are assumed to be in 2014 dollars.

Tasks needed to be accomplished prior to facility design, such as environmental clearance, can sometimes be even higher than actual project construction costs. This is generally addressed on a case-by-case basis since not all projects will require such additional analysis. For example, Class 2 bicycle lanes are generally exempt from CEQA review.

This section provides planning-level construction cost estimates for the facilities listed in the plan and the methodology behind the cost estimation. Note that these figures do not include right-of-way acquisition or utility relocation.

Costs were based on recent construction bid data for materials costs, assumptions for facility geometry and recent experience with similar projects in southern California. All of the costs include the following assumed additional factors:

Construction Cost	
Contingency	20 percent
Bonding/Mobilization/Contractor Int Mngt	7.5 percent
Total:	**27.5 percent**

Design/Management/Permitting/Engineering	
Engineering/Design	10 percent
Environmental Clearance	4 percent
Permitting	2 percent
Bid Support Services	3 percent
Project Management	3 percent
Traffic Management Services	3 percent
Total:	**25.0 percent**

Class 1 Multi-use Path Costs

Unlike Class 2 and 3 facilities, Class 1 paths are separate from roadways, meaning that planning level cost estimation requires a measure of preliminary design to address conditions and to determine feasibility. For this reason, relatively detailed cost estimates were developed for each proposed Class 1 segment. This is in contrast with the other facility types, which occur on-street and for which per-mile costs can be generally applied.

Class 2 Bicycle Lane Costs

Class 2 bicycle lane cost can fall within a range of potential conditions. At the low end, it assumes that adequate space exists within the roadway to simply add bicycle lane striping and markings without modifying the roadway further, that the roadway is in good condition and does not require maintenance or rehabilitation as part of the striping project, and no modifications to intersection signal equipment are assumed.

At the next level of complexity, there is sufficient curb-to-curb width to install bicycle lanes, but modifications to existing striping would be necessary. This includes removal of existing striping and installation of new striping, as well as slurry-seal maintenance. This could include a reduction in vehicle lanes or narrowing of existing lanes.

The high end in terms of cost occurs where the curb-to-curb width is not sufficient to install bicycle lanes and the roadway would need to be widened by at least 10 feet to accommodate them. This could therefore include widened pavement sections, new curb, gutter and sidewalk, and street light relocation. Intersections may also need to be modified to move signal equipment and install new curb returns.

Proposed bicycle lanes were assigned an average per-mile cost of $58,080.

Class 3 Bicycle Route Costs

This category assumes signage and shared-use pavement markings ("Sharrows") only along the length of the route at intervals of 0.25 miles in each direction and at intersections, and that the roadway does not require rehabilitation or pre-construction maintenance. Class 3 bicycle routes were assigned an average per-mile cost of $13,200.

Bicycle Boulevard Costs

Bicycle boulevards are essentially Class 3 route facilities that may feature physical roadway modifications such as traffic calming measures or changes in intersection priority or access. Bicycle boulevard projects can therefore vary widely in cost, primarily due to the level of physical construction designed into them.

Because bicycle boulevards need to be evaluated in more detail to determine the extent of desired modification, this plan assumes that their costs are equivalent to those of typical Class 3 facilities employing signage and pavement markings only, to be revised as needed in final design prior to implementation.

Class 1 Multi-use Path Construction Cost Estimate Summary

PID	Project Name	Length (FT)	Cost (USD)
1	Juan Bautista De Anza Trail - P8	15,297	$5,116,559
2	Juan Bautista De Anza Trail - P4	2,188	$775,504
3	Juan Bautista De Anza Trail - P6	2,095	$670,274
4	Juan Bautista De Anza Trail - P3	3,557	$1,207,683
5	Juan Bautista De Anza Trail - P1	5,605	$1,567,109
6	Juan Bautista De Anza Trail - P5	6,749	$2,147,334
7	Juan Bautista De Anza Trail - P7	1,514	$595,547
8	Moreno Valley College Path	11,991	$3,089,831
9	Kitching Aqueduct Path	23,577	$7,282,306
10	Graham St Bike/Ped Bridge	530	$412,982
11	Juan Bautista De Anza Trail - P2	3,839	$1,159,684
12	Juan Bautista De Anza Trail - P9	2,777	$948,712
13	Rancho Verde High School Path	2,486	$637,042
14	South City Aqueduct Path	16,956	$4,360,686

Class 2 Bicycle Lane Construction Cost Estimate Summary

PID	Project Name	Length (FT)	Cost (USD)
1	Alessandro Boulevard	42,492	$467,412
2	Lasselle Street	13,911	$153,021
3	Iris Avenue	20,283	$223,113
4	Heacock Street	40,335	$443,685
5	Pigeon Pass Road	9,056	$99,616
6	Graham Street	10,969	$120,659
7	Perris Boulevard	13,939	$153,329
8	Cactus Avenue	31,530	$346,830
9	Ironwood Avenue	32,320	$355,520
10	Sunnymead Boulevard	13,329	$146,619
11	Cottonwood Avenue	7,921	$87,131
12	Indian Street	7,939	$87,329
13	Eucalyptus Avenue	52,029	$572,319
14	Moreno Beach Boulevard	20,035	$220,385
15	Frederick Street	9,896	$108,856
16	Towngate Avenue	3,471	$38,181
17	Kitching Street	23,747	$261,217
18	Box Springs Road	5,304	$58,344
19	Elder Avenue	11,130	$122,429
20	Gentian Avenue	7,808	$85,888
21	Centerpoint Drive	1,721	$18,931
22	Hemlock Avenue	10,905	$119,955
23	Old Lake Drive	2,691	$29,601
24	Elsworth Street	7,886	$86,746
25	Redlands Boulevard	18,677	$205,447
26	Fir Ave	1,049	$11,539
27	Krameria Avenue	11,778	$129,558
28	Oliver Street	5,382	$59,202
29	Morrison Street	7,985	$87,835
30	Old 215/Valley Springs Parkway	9,253	$101,783
31	Nason Street	13,308	$146,388

Class 3 Bicycle Route Construction Cost Estimate Summary

PID	Project Name	Length (FT)	Cost (USD)
1	Graham Street	1,823	$4,558
2	Hemlock Avenue	8,001	$20,003
3	Cottonwood Avenue	11,120	$27,800
4	Day Street	5,289	$13,223
5	Camino Bellagio/Via Pamplona	1,568	$3,920
6	Brodiaea Avenue	26,430	$66,075
7	Davis Street	6,923	$17,308
8	Indian Street	5,335	$13,338
9	Morton Road	3,876	$9,690
10	Parkland Avenue	1,921	$4,803
11	Locust Avenue	6,626	$16,565

Bicycle Boulevard Construction Cost Estimate Summary*

PID	Project Name	Length (FT)	Cost (USD)
1	Bay Avenue	12,825	$32,063
2	Delphinium Avenue	10,522	$26,305
3	Dracaea Avenue	23,825	$59,563
4	Fir Avenue	15,844	$39,610
5	Gentian Avenue	2,723	$6,808

**Note: Bicycle boulevards have not yet been widely implemented, so no widely accepted standards exist. Their costs are therefore highly variable and can increase significantly if the full range of potential physical improvements are included, such as motor vehicle traffic diverters, median refuge islands, roundabouts, street trees, improved lighting, etc.*

These cost figures reflect the extreme low range with minimal physical improvements matching those of Class 3 bicycle routes, which typically include signage and shared lane ("Sharrow") markings only.

Class 1 Multi-Use Path Construction Cost Estimates

Project Segment: Juan Bautista de Anza Trail - Segment P1

Project Length (Feet)	5,605
Project Length (Miles)	1.06

Items	Unit Cost	Unit	QTY	Cost Estimate
Demolition				
Clear and Grub	$1	SF	67,260	$67,260
Remove and Replace Curb and Gutter (includes grading)	$42	LF	5,605	$235,410
Asphalt	$4	SF	67,260	$269,040
Excavate and Export 1,000-20,000	$35	CY	4,982	$174,378
Removing Traffic Stripes	$4	LF	5,605	$22,420
			Demolition Totals:	$768,508
Paving				
Asphalt	$2	SF	67,260	$134,520
Curb Ramps	$1,000	EA	16	$16,000
Truncated Dome	$400	EA	16	$6,400
			Paving Totals:	$156,920
Signage/Wayfinding				
Bicycle Path Signs (with core drilling)	$350	EA	16	$5,600
Bicycle Lane/Sharrow Marking, Paint	$180	EA	16	$2,880
Bicycle Detector Loop	$700	EA	16	$11,200
Wayfinding/Informative Signs	$350	EA	22	$7,700
Regulatory Signs (Stop signs, etc.)	$350	EA	32	$11,200
			Signage Totals:	$38,580
Road Striping				
Centerline Striping	$1	LF	5,605	$5,605
Crosswalk Striping at signalized intersection (with detector modifications)	$5,000	EA	1	$5,000
High Visibility Crosswalk Striping (no detector modifications) (11)	$2,500	EA	6	$15,000
			Striping Totals:	$25,605
Enhanced Safety Measures				
Rectangular Rapid Flashing Beacon/Pedestrian Signal	$22,000	EA	1	$22,000
Refuge Island	$16,000	EA	1	$16,000
			Safety Measure Totals:	$38,000

* Cost estimate does not include land acquisition or utilities

Base Line Cost:	$1,027,613
CONSTRUCTION COST	
Contingency (20%):	$205,523
Bonding / Mobilization / Contractor Internal Management (7.5%):	$77,071
TOTAL CONSTRUCTION COST:	$282,594
DESIGN / MANAGEMENT / PERMITTING / ENGINEERING	
Engineering / Design (10%):	$102,761
Environmental Clearance (4%):	$41,105
Permitting (2%):	$20,552
Bid Support Services (3%):	$30,828
Project Management (3%):	$30,828
Traffic Management Services (3%):	$30,828
TOTAL SOFT COST:	$256,903
TOTAL COST:	$1,567,109

Project Segment: Juan Bautista de Anza Trail - Segment P2

Project Length (Feet)	3,839
Project Length (Miles)	0.73

Items	Unit Cost	Unit	QTY	Cost Estimate
Demolition				
Clear and Grub	$1	SF	46,065	$46,065
Remove and Replace Curb and Gutter (includes grading)	$42	LF	3,839	$161,229
Asphalt	$4	SF	46,065	$184,261
Excavate and Export 1,000-20,000	$35	CY	3,412	$119,429
Removing Traffic Stripes	$4	LF	3,839	$15,355
			Demolition Totals:	$526,339
Paving				
Asphalt	$2	SF	46,065	$92,131
Curb Ramps	$1,000	EA	8	$8,000
Truncated Dome	$400	EA	8	$3,200
			Paving Totals:	$103,331
Signage/Wayfinding				
Bicycle Path Signs (with core drilling)	$350	EA	8	$2,800
Bicycle Lane/Sharrow Marking, Paint	$180	EA	8	$1,440
Bicycle Detector Loop	$700	EA	8	$5,600
Wayfinding/Informative Signs	$350	EA	10	$3,500
Regulatory Signs (Stop signs, etc.)	$350	EA	16	$5,600
			Signage Totals:	$18,940
Road Striping				
Centerline Striping	$1	LF	3,839	$3,839
High Visibility Crosswalk Striping (no detector modifications) (11)	$2,500	EA	4	$10,000
			Striping Totals:	$13,839
Enhanced Safety Measures				
Rectangular Rapid Flashing Beacon/Pedestrian Signal	$22,000	EA	1	$22,000
Pedestrian Hybrid Beacon (PHB)	$60,000	EA	1	$60,000
Refuge Island	$16,000	EA	1	$16,000
			Safety Measure Totals:	$98,000

* Cost estimate does not include land acquisition or utilities

Base Line Cost:	$760,449
CONSTRUCTION COST	
Contingency (20%):	$152,090
Bonding / Mobilization / Contractor Internal Management (7.5%):	$57,034
TOTAL CONSTRUCTION COST:	$209,123
DESIGN / MANAGEMENT / PERMITTING / ENGINEERING	
Engineering / Design (10%):	$76,045
Environmental Clearance (4%):	$30,418
Permitting (2%):	$15,209
Bid Support Services (3%):	$22,813
Project Management (3%):	$22,813
Traffic Management Services (3%):	$22,813
TOTAL SOFT COST:	$190,112
TOTAL COST:	$1,159,684

Class 1 Multi-Use Path Construction Cost Estimates

Project Segment: Juan Bautista de Anza Trail - Segment P3

Project Length (Feet)	3,557
Project Length (Miles)	0.67

Items	Unit Cost	Unit	QTY	Cost Estimate
Demolition				
Clear and Grub	$1	SF	42,685	$42,685
Remove and Replace Curb and Gutter (includes grading)	$42	LF	3,557	$149,399
Asphalt	$4	SF	42,685	$170,742
Concrete Pavement	$9	SF	2,445	$22,005
Excavate and Export 1,000-20,000	$35	CY	3,162	$110,666
Removing Traffic Stripes	$4	LF	3,557	$14,228
			Demolition Totals:	$509,725
Paving				
Asphalt	$2	SF	42,685	$85,371
Curb Ramps	$1,000	EA	14	$14,000
Truncated Dome	$400	EA	14	$5,600
			Paving Totals:	$104,971
Signage/Wayfinding				
Bicycle Path Signs (with core drilling)	$350	EA	14	$4,900
Bicycle Lane/Sharrow Marking, Paint	$180	EA	14	$2,520
Bicycle Detector Loop	$700	EA	14	$9,800
Wayfinding/Informative Signs	$350	EA	19	$6,650
Regulatory Signs (Stop signs, etc.)	$350	EA	28	$9,800
			Signage Totals:	$33,670
Road Striping				
Centerline Striping	$1	LF	3,557	$3,557
Crosswalk Striping at signalized intersection (with detector modifications)	$5,000	EA	1	$5,000
High Visibility Crosswalk Striping (no detector modifications) (11)	$2,500	EA	6	$15,000
			Striping Totals:	$23,557
Enhanced Safety Measures				
Rectangular Rapid Flashing Beacon/Pedestrian Signal	$22,000	EA	2	$44,000
Pedestrian Hybrid Beacon (PHB)	$60,000	EA	1	$60,000
Refuge Island	$16,000	EA	1	$16,000
			Safety Measure Totals:	$120,000

* Cost estimate does not include land acquisition or utilities

Base Line Cost:	$791,923
CONSTRUCTION COST	
Contingency (20%):	$158,385
Bonding / Mobilization / Contractor Internal Management (7.5%):	$59,394
TOTAL CONSTRUCTION COST:	$217,779
DESIGN / MANAGEMENT / PERMITTING / ENGINEERING	
Engineering / Design (10%):	$79,192
Environmental Clearance (4%):	$31,677
Permitting (2%):	$15,838
Bid Support Services (3%):	$23,758
Project Management (3%):	$23,758
Traffic Management Services (3%):	$23,758
TOTAL SOFT COST:	$197,981
TOTAL COST:	$1,207,683

Project Segment: Juan Bautista de Anza Trail - Segment P4

Project Length (Feet)	2,188
Project Length (Miles)	0.41

Items	Unit Cost	Unit	QTY	Cost Estimate
Demolition				
Clear and Grub	$1	SF	26,257	$26,257
Remove and Replace Curb and Gutter (includes grading)	$42	LF	2,188	$91,899
Asphalt	$4	SF	26,257	$105,028
Excavate and Export 1,000-20,000	$35	CY	1,945	$68,074
Removing Traffic Stripes	$4	LF	2,188	$8,752
			Demolition Totals:	$300,010
Paving				
Asphalt	$2	SF	26,257	$52,514
Curb Ramps	$1,000	EA	6	$6,000
Truncated Dome	$400	EA	6	$2,400
			Paving Totals:	$60,914
Fences and Gates				
5' Chainlink Fence	$18	LF	2,188	$39,385
			Fences and Gates Totals:	$39,385
Bridges				
Pedestrian/Bicycle Culvert Bridge	$100	LF	85	$8,500
			Bridge Totals:	$8,500
Signage/Wayfinding				
Bicycle Path Signs (with core drilling)	$350	EA	6	$2,100
Bicycle Lane/Sharrow Marking, Paint	$180	EA	6	$1,080
Bicycle Detector Loop	$700	EA	6	$4,200
Wayfinding/Informative Signs	$350	EA	7	$2,450
Regulatory Signs (Stop signs, etc.)	$350	EA	12	$4,200
			Signage Totals:	$14,030
Road Striping				
Centerline Striping	$1	LF	2,188	$2,188
Crosswalk Striping at signalized intersection (with detector modifications)	$5,000	EA	1	$5,000
High Visibility Crosswalk Striping (no detector modifications) (11)	$2,500	EA	1	$2,500
			Striping Totals:	$9,688
Enhanced Safety Measures				
Pedestrian Hybrid Beacon (PHB)	$60,000	EA	1	$60,000
Refuge Island	$16,000	EA	1	$16,000
			Safety Measure Totals:	$76,000

* Cost estimate does not include land acquisition or utilities

Base Line Cost:	$508,527
CONSTRUCTION COST	
Contingency (20%):	$101,705
Bonding / Mobilization / Contractor Internal Management (7.5%):	$38,140
TOTAL CONSTRUCTION COST:	$139,845
DESIGN / MANAGEMENT / PERMITTING / ENGINEERING	
Engineering / Design (10%):	$50,853
Environmental Clearance (4%):	$20,341
Permitting (2%):	$10,171
Bid Support Services (3%):	$15,256
Project Management (3%):	$15,256
Traffic Management Services (3%):	$15,256
TOTAL SOFT COST:	$127,132
TOTAL COST:	$775,504

Class 1 Multi-Use Path Construction Cost Estimates

Project Segment: Juan Bautista de Anza Trail - Segment P5

Project Length (Feet)	6,750
Project Length (Miles)	1.28

Items	Unit Cost	Unit	QTY	Cost Estimate
Demolition				
Clear and Grub	$1	SF	80,996	$80,996
Remove and Replace Curb and Gutter (includes grading)	$42	LF	6,750	$283,488
Asphalt	$4	SF	80,996	$323,986
Excavate and Export 1,000-20,000	$35	CY	6,000	$209,991
			Demolition Totals:	$898,461
Paving				
Asphalt	$2	SF	80,996	$161,993
Curb Ramps	$1,000	EA	8	$8,000
Truncated Dome	$400	EA	8	$3,200
			Paving Totals:	$173,193
Fences and Gates				
5' Chainlink Fence	$18	LF	6,750	$121,495
			Fences and Gates Totals:	$121,495
Bridges				
Pedestrian/Bicycle Culvert Bridge	$100	LF	85	$8,500
			Bridge Totals:	$8,500
Signage/Wayfinding				
Bicycle Path Signs (with core drilling)	$350	EA	8	$2,800
Bicycle Lane/Sharrow Marking, Paint	$180	EA	8	$1,440
Bicycle Detector Loop	$700	EA	8	$5,600
Wayfinding/Informative Signs	$350	EA	10	$3,500
Regulatory Signs (Stop signs, etc.)	$350	EA	16	$5,600
			Signage Totals:	$18,940
Road Striping				
High Visibility Crosswalk Striping (no detector modifications) (11)	$2,500	EA	7	$17,500
			Striping Totals:	$17,500
Enhanced Safety Measures				
Rectangular Rapid Flashing Beacon/Pedestrian Signal	$22,000	EA	7	$154,000
Refuge Island	$16,000	EA	1	$16,000
			Safety Measure Totals:	$170,000

* Cost estimate does not include land acquisition or utilities

Base Line Cost:	$1,408,088
CONSTRUCTION COST	
Contingency (20%):	$281,618
Bonding / Mobilization / Contractor Internal Management (7.5%):	$105,607
TOTAL CONSTRUCTION COST:	$387,224
DESIGN / MANAGEMENT / PERMITTING / ENGINEERING	
Engineering / Design (10%):	$140,809
Environmental Clearance (4%):	$56,324
Permitting (2%):	$28,162
Bid Support Services (3%):	$42,243
Project Management (3%):	$42,243
Traffic Management Services (3%):	$42,243
TOTAL SOFT COST:	$352,022
TOTAL COST:	$2,147,334

Project Segment: Juan Bautista de Anza Trail - Segment P6

Project Length (Feet)	2,095
Project Length (Miles)	0.40

Items	Unit Cost	Unit	QTY	Cost Estimate
Demolition				
Clear and Grub	$1	SF	25,143	$25,143
Remove and Replace Curb and Gutter (includes grading)	$42	LF	2,095	$88,002
Asphalt	$4	SF	25,143	$100,574
Excavate and Export 1,000-20,000	$35	CY	1,862	$65,187
Removing Traffic Stripes	$4	LF	2,095	$8,381
			Demolition Totals:	$287,287
Paving				
Asphalt	$2	SF	25,143	$50,287
Curb Ramps	$1,000	EA	8	$8,000
Truncated Dome	$400	EA	8	$3,200
			Paving Totals:	$61,487
Fences and Gates				
5' Chainlink Fence	$18	LF	2,095	$37,715
			Fences and Gates Totals:	$37,715
Signage/Wayfinding				
Bicycle Path Signs (with core drilling)	$350	EA	8	$2,800
Bicycle Lane/Sharrow Marking, Paint	$180	EA	8	$1,440
Bicycle Detector Loop	$700	EA	8	$5,600
Wayfinding/Informative Signs	$350	EA	10	$3,500
Regulatory Signs (Stop signs, etc.)	$350	EA	16	$5,600
			Signage Totals:	$18,940
Road Striping				
Centerline Striping	$1	LF	2,095	$2,095
Crosswalk Striping at signalized intersection (with detector modifications)	$5,000	EA	1	$5,000
High Visibility Crosswalk Striping (no detector modifications) (11)	$2,500	EA	2	$5,000
			Striping Totals:	$12,095
Enhanced Safety Measures				
Rectangular Rapid Flashing Beacon/Pedestrian Signal	$22,000	EA	1	$22,000
			Safety Measure Totals:	$22,000

* Cost estimate does not include land acquisition or utilities

Base Line Cost:	$439,524
CONSTRUCTION COST	
Contingency (20%):	$87,905
Bonding / Mobilization / Contractor Internal Management (7.5%):	$32,964
TOTAL CONSTRUCTION COST:	$120,869
DESIGN / MANAGEMENT / PERMITTING / ENGINEERING	
Engineering / Design (10%):	$43,952
Environmental Clearance (4%):	$17,581
Permitting (2%):	$8,790
Bid Support Services (3%):	$13,186
Project Management (3%):	$13,186
Traffic Management Services (3%):	$13,186
TOTAL SOFT COST:	$109,881
TOTAL COST:	$670,274

Class 1 Multi-Use Path Construction Cost Estimates

Project Segment: Juan Bautista de Anza Trail - Segment P7

Project Length (Feet)	1,515
Project Length (Miles)	0.29

Items	Unit Cost	Unit	QTY	Cost Estimate
Demolition				
Clear and Grub	$1	SF	18,176	$18,176
Remove and Replace Curb and Gutter (includes grading)	$42	LF	1,515	$63,615
Asphalt	$4	SF	18,176	$72,702
Excavate and Export 1,000-20,000	$35	CY	1,346	$47,122
Removing Traffic Stripes	$4	LF	1,515	$6,059
			Demolition Totals:	$207,673
Paving				
Asphalt	$2	SF	18,176	$36,351
Curb Ramps	$1,000	EA	4	$4,000
Truncated Dome	$400	EA	4	$1,600
			Paving Totals:	$41,951
Fences and Gates				
5' Chainlink Fence	$18	LF	1,515	$27,263
			Fences and Gates Totals:	$27,263
Signage/Wayfinding				
Bicycle Path Signs (with core drilling)	$350	EA	4	$1,400
Bicycle Lane/Sharrow Marking, Paint	$180	EA	4	$720
Bicycle Detector Loop	$700	EA	4	$2,800
Wayfinding/Informative Signs	$350	EA	4	$1,400
Regulatory Signs (Stop signs, etc.)	$350	EA	8	$2,800
			Signage Totals:	$9,120
Road Striping				
Centerline Striping	$1	LF	1,515	$1,515
High Visibility Crosswalk Striping (no detector modifications) (11)	$2,500	EA	2	$5,000
			Striping Totals:	$6,515
Enhanced Safety Measures				
Rectangular Rapid Flashing Beacon/Pedestrian Signal	$22,000	EA	1	$22,000
Pedestrian Hybrid Beacon (PHB)	$60,000	EA	1	$60,000
Refuge Island	$16,000	EA	1	$16,000
			Safety Measure Totals:	$98,000

* Cost estimate does not include land acquisition or utilities

Base Line Cost:	$390,523
CONSTRUCTION COST	
Contingency (20%):	$78,105
Bonding / Mobilization / Contractor Internal Management (7.5%):	$29,289
TOTAL CONSTRUCTION COST:	$107,394
DESIGN / MANAGEMENT / PERMITTING / ENGINEERING	
Engineering / Design (10%):	$39,052
Environmental Clearance (4%):	$15,621
Permitting (2%):	$7,810
Bid Support Services (3%):	$11,716
Project Management (3%):	$11,716
Traffic Management Services (3%):	$11,716
TOTAL SOFT COST:	$97,631
TOTAL COST:	$595,547

Project Segment: Juan Bautista de Anza Trail - Segment P8

Project Length (Feet)	15,298
Project Length (Miles)	2.90

Items	Unit Cost	Unit	QTY	Cost Estimate
Demolition				
Clear and Grub	$1	SF	183,572	$183,572
Remove and Replace Curb and Gutter (includes grading)	$42	LF	15,298	$642,502
Asphalt	$4	SF	183,572	$734,288
Excavate and Export 1,000-20,000	$35	CY	13,598	$475,928
Removing Traffic Stripes	$4	LF	15,298	$61,191
			Demolition Totals:	$2,097,481
Paving				
Asphalt	$2	SF	183,572	$367,144
Curb Ramps	$1,000	EA	48	$48,000
Truncated Dome	$400	EA	48	$19,200
			Paving Totals:	$434,344
Fences and Gates				
5' Chainlink Fence	$18	LF	15,298	$275,358
			Fences and Gates Totals:	$275,358
Signage/Wayfinding				
Bicycle Path Signs (with core drilling)	$350	EA	48	$16,800
Bicycle Lane/Sharrow Marking, Paint	$180	EA	48	$8,640
Bicycle Detector Loop	$700	EA	48	$33,600
Wayfinding/Informative Signs	$350	EA	70	$24,500
Regulatory Signs (Stop signs, etc.)	$350	EA	96	$33,600
			Signage Totals:	$117,140
Road Striping				
Centerline Striping	$1	LF	15,298	$15,298
Crosswalk Striping at signalized intersection (with detector modifications)	$5,000	EA	4	$20,000
High Visibility Crosswalk Striping (no detector modifications) (11)	$2,500	EA	15	$37,500
			Striping Totals:	$72,798
Enhanced Safety Measures				
Rectangular Rapid Flashing Beacon/Pedestrian Signal	$22,000	EA	1	$22,000
Pedestrian Hybrid Beacon (PHB)	$60,000	EA	4	$240,000
Refuge Island	$16,000	EA	6	$96,000
			Safety Measure Totals:	$358,000

* Cost estimate does not include land acquisition or utilities

Base Line Cost:	$3,355,121
CONSTRUCTION COST	
Contingency (20%):	$671,024
Bonding / Mobilization / Contractor Internal Management (7.5%):	$251,634
TOTAL CONSTRUCTION COST:	$922,658
DESIGN / MANAGEMENT / PERMITTING / ENGINEERING	
Engineering / Design (10%):	$335,512
Environmental Clearance (4%):	$134,205
Permitting (2%):	$67,102
Bid Support Services (3%):	$100,654
Project Management (3%):	$100,654
Traffic Management Services (3%):	$100,654
TOTAL SOFT COST:	$838,780
TOTAL COST:	$5,116,559

Class 1 Multi-Use Path Construction Cost Estimates

Project Segment: Juan Bautista de Anza Trail - Segment P9

Project Length (Feet)	2,777
Project Length (Miles)	0.53

Items	Unit Cost	Unit	QTY	Cost Estimate
Demolition				
Clear and Grub	$1	SF	33,328	$33,328
Remove and Replace Curb and Gutter (includes grading)	$42	LF	2,777	$116,649
Asphalt	$4	SF	33,328	$133,313
Concrete Pavement	$9	SF	625	$5,625
Excavate and Export 1,000-20,000	$35	CY	2,469	$86,406
Removing Traffic Stripes	$4	LF	2,777	$11,109
			Demolition Totals:	$386,430
Paving				
Asphalt	$2	SF	33,328	$66,656
Curb Ramps	$1,000	EA	10	$10,000
Truncated Dome	$400	EA	10	$4,000
			Paving Totals:	$80,656
Fences and Gates				
5' Chainlink Fence	$18	LF	2,777	$49,992
			Fences and Gates Totals:	$49,992
Bridges				
Pedestrian/Bicycle Bridge	$320	LF	145	$46,400
			Bridge Totals:	$46,400
Signage/Wayfinding				
Bicycle Path Signs (with core drilling)	$350	EA	10	$3,500
Bicycle Lane/Sharrow Marking, Paint	$180	EA	10	$1,800
Bicycle Detector Loop	$700	EA	10	$7,000
Wayfinding/Informative Signs	$350	EA	13	$4,550
Regulatory Signs (Stop signs, etc.)	$350	EA	20	$7,000
			Signage Totals:	$23,850
Road Striping				
Centerline Striping	$1	LF	2,777	$2,777
Crosswalk Striping at signalized intersection (with detector modifications)	$5,000	EA	1	$5,000
High Visibility Crosswalk Striping (no detector modifications) (11)	$2,500	EA	2	$5,000
			Striping Totals:	$12,777
Enhanced Safety Measures				
Rectangular Rapid Flashing Beacon/Pedestrian Signal	$22,000	EA	1	$22,000
			Safety Measure Totals:	$22,000

* Cost estimate does not include land acquisition or utilities

Base Line Cost:	$622,106
CONSTRUCTION COST	
Contingency (20%):	$124,421
Bonding / Mobilization / Contractor Internal Management (7.5%):	$46,658
TOTAL CONSTRUCTION COST:	$171,079
DESIGN / MANAGEMENT / PERMITTING / ENGINEERING	
Engineering / Design (10%):	$62,211
Environmental Clearance (4%):	$24,884
Permitting (2%):	$12,442
Bid Support Services (3%):	$18,663
Project Management (3%):	$18,663
Traffic Management Services (3%):	$18,663
TOTAL SOFT COST:	$155,526
TOTAL COST:	$948,712

Project Segment: Moreno Valley College Path

Project Length (Feet)	11,991
Project Length (Miles)	2.27

Items	Unit Cost	Unit	QTY	Cost Estimate
Demolition				
Clear and Grub	$1	SF	143,894	$143,894
Remove and Replace Curb and Gutter (includes grading)	$42	LF	11,991	$503,628
Asphalt	$4	SF	143,894	$575,575
Excavate and Export 1,000-20,000	$35	CY	10,659	$373,058
Removing Traffic Stripes	$4	LF	11,991	$47,965
			Demolition Totals:	$1,644,120
Paving				
Asphalt	$2	SF	143,894	$287,788
Curb Ramps	$1,000	EA	4	$4,000
Truncated Dome	$400	EA	4	$1,600
			Paving Totals:	$293,388
Signage/Wayfinding				
Bicycle Path Signs (with core drilling)	$350	EA	4	$1,400
Bicycle Lane/Sharrow Marking, Paint	$180	EA	4	$720
Bicycle Detector Loop	$700	EA	4	$2,800
Wayfinding/Informative Signs	$350	EA	4	$1,400
Regulatory Signs (Stop signs, etc.)	$350	EA	8	$2,800
			Signage Totals:	$9,120
Road Striping				
Centerline Striping	$1	LF	11,991	$11,991
Crosswalk Striping at signalized intersection (with detector modifications)	$5,000	EA	1	$5,000
High Visibility Crosswalk Striping (no detector modifications) (11)	$2,500	EA	1	$2,500
			Striping Totals:	$19,491
Enhanced Safety Measures				
Pedestrian Hybrid Beacon (PHB)	$60,000	EA	1	$60,000
			Safety Measure Totals:	$60,000

* Cost estimate does not include land acquisition or utilities

Base Line Cost:	$2,026,119
CONSTRUCTION COST	
Contingency (20%):	$405,224
Bonding / Mobilization / Contractor Internal Management (7.5%):	$151,959
TOTAL CONSTRUCTION COST:	$557,183
DESIGN / MANAGEMENT / PERMITTING / ENGINEERING	
Engineering / Design (10%):	$202,612
Environmental Clearance (4%):	$81,045
Permitting (2%):	$40,522
Bid Support Services (3%):	$60,784
Project Management (3%):	$60,784
Traffic Management Services (3%):	$60,784
TOTAL SOFT COST:	$506,530
TOTAL COST:	$3,089,831

Class 1 Multi-Use Path Construction Cost Estimates

Project Segment: Rancho Verde High School Path

Project Length (Feet)	2,486
Project Length (Miles)	0.47

Items	Unit Cost	Unit	QTY	Cost Estimate
Demolition				
Clear and Grub	$1	SF	29,832	$29,832
Remove and Replace Curb and Gutter (includes grading)	$42	LF	2,486	$104,413
Asphalt	$4	SF	29,832	$119,329
Excavate and Export 1,000-20,000	$35	CY	2,210	$77,343
Removing Traffic Stripes	$4	LF	2,486	$9,944
			Demolition Totals:	$340,862
Paving				
Asphalt	$2	SF	29,832	$59,665
Curb Ramps	$1,000	EA	4	$4,000
Truncated Dome	$400	EA	4	$1,600
			Paving Totals:	$65,265
Signage/Wayfinding				
Bicycle Path Signs (with core drilling)	$350	EA	4	$1,400
Bicycle Lane/Sharrow Marking, Paint	$180	EA	4	$720
Bicycle Detector Loop	$700	EA	4	$2,800
Wayfinding/Informative Signs	$350	EA	4	$1,400
Regulatory Signs (Stop signs, etc.)	$350	EA	8	$2,800
			Signage Totals:	$9,120
Road Striping				
Centerline Striping	$1	LF	2,486	$2,486
			Striping Totals:	$2,486

* Cost estimate does not include land acquisition or utilities

Base Line Cost:	$417,733
CONSTRUCTION COST	
Contingency (20%):	$83,547
Bonding / Mobilization / Contractor Internal Management (7.5%):	$31,330
TOTAL CONSTRUCTION COST:	$114,876
DESIGN / MANAGEMENT / PERMITTING / ENGINEERING	
Engineering / Design (10%):	$41,773
Environmental Clearance (4%):	$16,709
Permitting (2%):	$8,355
Bid Support Services (3%):	$12,532
Project Management (3%):	$12,532
Traffic Management Services (3%):	$12,532
TOTAL SOFT COST:	$104,433
TOTAL COST:	$637,042

Project Segment: Kitching Aqueduct Path

Project Length (Feet)	23,578
Project Length (Miles)	4.47

Items	Unit Cost	Unit	QTY	Cost Estimate
Demolition				
Clear and Grub	$1	SF	282,934	$282,934
Remove and Replace Curb and Gutter (includes grading)	$42	LF	23,578	$990,267
Asphalt	$4	SF	282,934	$1,131,734
Concrete Pavement	$9	SF	700	$6,300
Excavate and Export 1,000-20,000	$35	CY	20,958	$733,531
Removing Traffic Stripes	$4	LF	23,578	$94,311
Removing Parking Stripes	$25	EA	48	$1,200
			Demolition Totals:	$3,240,278
Paving				
Bulb-out/Curb Extension	$13,000	EA	3	$39,000
Asphalt	$2	SF	282,934	$565,867
Curb Ramps	$1,000	EA	32	$32,000
Truncated Dome	$400	EA	32	$12,800
			Paving Totals:	$649,667
Fences and Gates				
5' Chainlink Fence	$18	LF	23,578	$424,400
			Fences and Gates Totals:	$424,400
Signage/Wayfinding				
Bicycle Path Signs (with core drilling)	$350	EA	32	$11,200
Bicycle Lane/Sharrow Marking, Paint	$180	EA	32	$5,760
Bicycle Detector Loop	$700	EA	32	$22,400
Wayfinding/Informative Signs	$350	EA	46	$16,100
Regulatory Signs (Stop signs, etc.)	$350	EA	64	$22,400
			Signage Totals:	$77,860
Road Striping				
Centerline Striping	$1	LF	23,578	$23,578
Crosswalk Striping at signalized intersection (with detector modifications)	$5,000	EA	4	$20,000
High Visibility Crosswalk Striping (no detector modifications) (11)	$2,500	EA	7	$17,500
			Striping Totals:	$61,078
Enhanced Safety Measures				
Rectangular Rapid Flashing Beacon/Pedestrian Signal	$22,000	EA	3	$66,000
Pedestrian Hybrid Beacon (PHB)	$60,000	EA	4	$240,000
Refuge Island	$16,000	EA	1	$16,000
			Safety Measure Totals:	$322,000

* Cost estimate does not include land acquisition or utilities

Base Line Cost:	$4,775,283
CONSTRUCTION COST	
Contingency (20%):	$955,057
Bonding / Mobilization / Contractor Internal Management (7.5%):	$358,146
TOTAL CONSTRUCTION COST:	$1,313,203
DESIGN / MANAGEMENT / PERMITTING / ENGINEERING	
Engineering / Design (10%):	$477,528
Environmental Clearance (4%):	$191,011
Permitting (2%):	$95,506
Bid Support Services (3%):	$143,258
Project Management (3%):	$143,258
Traffic Management Services (3%):	$143,258
TOTAL SOFT COST:	$1,193,821
TOTAL COST:	$7,282,306

Class 1 Multi-Use Path Construction Cost Estimates

Project Segment: South City Aqueduct Path

Project Length (Feet)	16,957
Project Length (Miles)	3.21

Items	Unit Cost	Unit	QTY	Cost Estimate
Demolition				
Clear and Grub	$1	SF	203,483	$203,483
Remove and Replace Curb and Gutter (includes grading)	$42	LF	16,957	$712,191
Asphalt	$4	SF	203,483	$813,933
Excavate and Export 1,000-20,000	$35	CY	15,073	$527,549
Removing Traffic Stripes	$4	LF	16,957	$67,828
			Demolition Totals:	$2,324,983
Paving				
Asphalt	$2	SF	203,483	$406,966
Curb Ramps	$1,000	EA	12	$12,000
Truncated Dome	$400	EA	12	$4,800
			Paving Totals:	$423,766
Fences and Gates				
5' Chainlink Fence	$18	LF	16,957	(includes grading)
			Fences and Gates Totals:	$0
Signage/Wayfinding				
Bicycle Path Signs (with core drilling)	$350	EA	12	$4,200
Bicycle Lane/Sharrow Marking, Paint	$180	EA	12	$2,160
Bicycle Detector Loop	$700	EA	12	$8,400
Wayfinding/Informative Signs	$350	EA	16	$5,600
Regulatory Signs (Stop signs, etc.)	$350	EA	24	$8,400
			Signage Totals:	$28,760
Road Striping				
Centerline Striping	$1	LF	16,957	$16,957
High Visibility Crosswalk Striping (no detector modifications) (11)	$2,500	EA	2	$5,000
			Striping Totals:	$21,957
Enhanced Safety Measures				
Rectangular Rapid Flashing Beacon/Pedestrian Signal	$22,000	EA	2	$44,000
Refuge Island	$16,000	EA	1	$16,000
			Safety Measure Totals:	$60,000

* Cost estimate does not include land acquisition or utilities

Base Line Cost:	$2,859,466
CONSTRUCTION COST	
Contingency (20%):	$571,893
Bonding / Mobilization / Contractor Internal Management (7.5%):	$214,460
TOTAL CONSTRUCTION COST:	$786,353
DESIGN / MANAGEMENT / PERMITTING / ENGINEERING	
Engineering / Design (10%):	$285,947
Environmental Clearance (4%):	$114,379
Permitting (2%):	$57,189
Bid Support Services (3%):	$85,784
Project Management (3%):	$85,784
Traffic Management Services (3%):	$85,784
TOTAL SOFT COST:	$714,867
TOTAL COST:	$4,360,686

Project Segment: Graham Street/Bicycle-Ped Bridge

Project Length (Feet)	531
Project Length (Miles)	0.10

Items	Unit Cost	Unit	QTY	Cost Estimate
Demolition				
Clear and Grub	$1	SF	6,369	$6,369
Remove and Replace Curb and Gutter (includes grading)	$42	LF	531	$22,290
Asphalt	$4	SF	6,369	$25,474
Excavate and Export 1,000-20,000	$35	CY	472	$16,511
Removing Traffic Stripes	$4	LF	531	$2,123
			Demolition Totals:	$72,767
Paving				
Asphalt	$2	SF	6,369	$12,737
Curb Ramps	$1,000	EA	4	$4,000
Truncated Dome	$400	EA	4	$1,600
			Paving Totals:	$18,337
Fences and Gates				
5' Chainlink Fence	$18	LF	531	$9,553
			Fences and Gates Totals:	$9,553
Bridges				
Pedestrian/Bicycle Bridge	$320	LF	375	$120,000
			Bridge Totals:	$120,000
Signage/Wayfinding				
Bicycle Path Signs (with core drilling)	$350	EA	4	$1,400
Bicycle Lane/Sharrow Marking, Paint	$180	EA	4	$720
Bicycle Detector Loop	$700	EA	4	$2,800
Wayfinding/Informative Signs	$350	EA	4	$1,400
Regulatory Signs (Stop signs, etc.)	$350	EA	8	$2,800
			Signage Totals:	$9,120
Road Striping				
Centerline Striping	$1	LF	531	$531
High Visibility Crosswalk Striping (no detector modifications) (11)	$2,500	EA	1	$2,500
			Striping Totals:	$3,031
Enhanced Safety Measures				
Rectangular Rapid Flashing Beacon/Pedestrian Signal	$22,000	EA	1	$22,000
Refuge Island	$16,000	EA	1	$16,000
			Safety Measure Totals:	$38,000

* Cost estimate does not include land acquisition or utilities

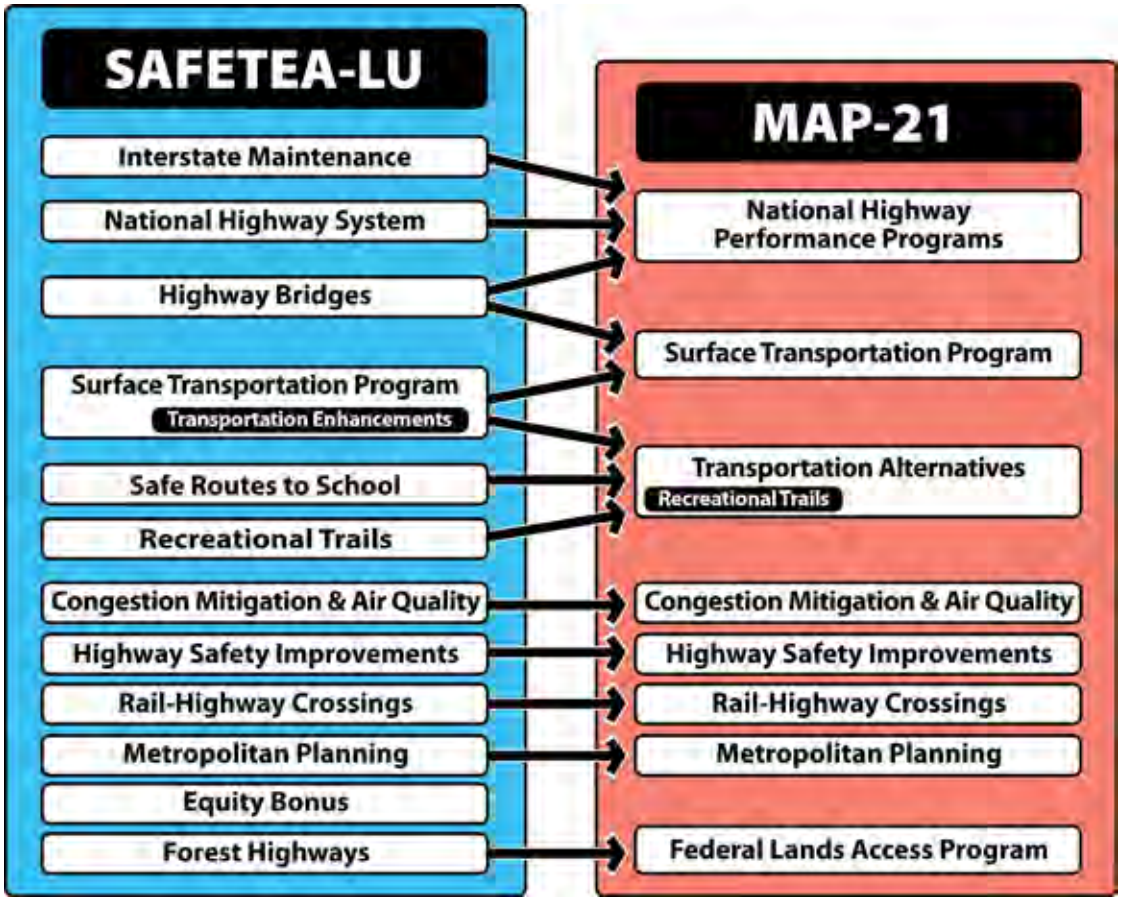
Base Line Cost:	$270,808
CONSTRUCTION COST	
Contingency (20%):	$54,162
Bonding / Mobilization / Contractor Internal Management (7.5%):	$20,311
TOTAL CONSTRUCTION COST:	$74,472
DESIGN / MANAGEMENT / PERMITTING / ENGINEERING	
Engineering / Design (10%):	$27,081
Environmental Clearance (4%):	$10,832
Permitting (2%):	$5,416
Bid Support Services (3%):	$8,124
Project Management (3%):	$8,124
Traffic Management Services (3%):	$8,124
TOTAL SOFT COST:	$67,702
TOTAL COST:	$412,982

4.2 Funding Sources

Federal, State and local government agencies invest billions of dollars every year in the nation's transportation system. Only a fraction of that funding is used in development projects, policy development and planning to improve conditions for cyclists. Even though appropriate funds are limited, they are available, but desirable projects sometimes go unfunded because communities may be unaware of a fund's existence, or may apply for the wrong type of grants. Also, the competition between municipalities for the available bikeway funding is often fierce.

Whenever federal funds are used for bicycle projects, a certain level of State and/or local matching funding is generally required. State funds are often available to local governments on the similar terms. Almost every implemented bicycle program and facility in the United States has had more than one funding source and it often takes a good deal of coordination to pull the various sources together.

According to the Federal Highway Administration's (FHWA) publication, *An Analysis of Current Funding Mechanisms for Bicycle and Pedestrian Programs at the Federal, State and Local Levels*, where successful local bicycle facility programs exist, there is usually a full time bicycle coordinator with extensive understanding of funding sources. Cities such as Seattle, Washington, Portland, Oregon and Tucson are prime examples. Bicycle coordinators are often in a position to develop a competitive project and detailed proposal that can be used to improve conditions for cyclists within their jurisdictions. Some of the following information on federal and State funding sources was derived from the previously mentioned FHWA publication.



Federal Sources

The long legacy of U.S. Department of Transportation Enhancement Funds SAFETEA-LU (*Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users)* has ended and has been substantially replaced with a new funding mechanism entitled MAP-21. MAP-21 (*Moving Ahead for Progress in the 21st Century*) was approved by Congress and signed by the President in 2012.

MAP-21 replaces SAFETEA-LU with a similar amount of total funding, but significantly changes the overall number and scope of programs. The number of programs has been consolidated by two-thirds. The graphic on the previous page illustrates the relationship between the two federal funding sources. The Transportation Enhancements (TE) program has been eliminated and replaced with Transportation Alternatives (TA). The Recreational Trails program is now housed under the Transportation Alternatives Program. Bicycle projects remain eligible for major funding and MAP-21 does have an emphasis on safety and active transportation with a 30 percent increase in CMAQ, doubled Highway Safety Improvement funds and specific mentions of bicycle projects.

There remains some uncertainties regarding the details and interpretations of these changes. The federal levels of funding and scope have been set, yet it remains to be defined how the State and local programs will individually implement these funding mechanisms. Also, the latest reauthorization period is nearing its end, setting the stage for the next chapter of reauthorization.

Safe Routes to School Programs

There are two separate Safe Routes to School Programs administered by Caltrans. There is the State-legislated program referred to as SR2S and there is the Federal Program referred to as SRTS. Both programs are intended to achieve the same basic goal of increasing the number of children walking and cycling to school by making it safer for them to do so. The differences between the two programs are as follows:

- **Legislative Authority**
  SR2S - Streets & Highways Code Section 2330-2334
  SRTS - Section 1404 in SAFETEA-LU
- **Expires**
  SR2S - AB-57 extended program indefinitely
  SRTS - Pending SAFETEA-LU reauthorization.
- **Eligible Applicants**
  SR2S - Cities and counties
  SRTS - State, local, and regional agencies experienced in meeting federal transportation requirements. Non-profit organizations, school districts, public health departments, and Native American Tribes must partner with a city, county, MPO, or RTPA to serve as the responsible agency for their project.
- **Eligible Projects**
  SR2S - Infrastructure projects
  SRTS - Stand-alone infrastructure or non-infrastructure projects
- **Local Match**
  SR2S - 10 percent minimum required
  SRTS – None
- **Project Completion Deadline**
  SR2S - Within 4 ½ years after project funds are allocated to the agency
  SRTS - Within 4 ½ years after project is amended into FTIP
- **Restriction on Infrastructure Projects**
  SR2S - Must be located in the vicinity of a school
  SRTS - Infrastructure projects must be within 2 miles of a grade school or middle school
- **Targeted Beneficiaries**
  SR2S - Children in grades K-12
  SRTS - Children in grades K-8
- **Funding**
  SR2S - $24.25M annual funding
  SRTS - $23M annual funding

The Safe Routes to School Program funds nonmotorized facilities in conjunction with improving access to schools through the Caltrans Safe Routes to School Coordinator. For more information visit: *http://www.dot.ca.gov/hq/LocalPrograms/saferoutes/saferoutes.htm*

Department of the Interior - Land and Water Conservation Fund (LWCF)

The U.S. Recreation and Heritage Conservation Service and the State Department of Park and Recreation administer this funding source. Any project for which LWCF funds are desired must meet two specific criteria. The first is that projects acquired or developed under the program must be primarily for recreational use and not transportation purposes and the second is that the lead agency must guarantee to maintain the facility in perpetuity for public recreation. The application will be considered using criteria such as priority status within the State Comprehensive Outdoor Recreation Plan (SCORP). The State Department of Park and Recreation will select which projects to submit to the National Park Service (NPS) for approval. Final approval is based on the amount of funds available that year, which is determined by a population based formula. Trails are the most commonly approved project.

Rivers, Trails, and Conservation Assistance Program (RTCA)

The Rivers, Trails and Conservation Assistance Program is the community assistance arm of the National Park Service. RTCA provides technical assistance to communities in order to preserve open space and develop trails. The assistance that RTCA provides is not for infrastructure, but rather building plans, engaging public participation and identifying other sources of funding for conversation and outdoor recreation projects.

Other Bicycle Infrastructure Funding Options

Additionally, states received a one time appropriation of $53.6 billion in state fiscal stabilization funding under the American Recovery and Reinvestment Act (ARRA) in 2009. States must use 18.2 percent of their funding – or $9.7 billion – for public safety and government services. An eligible activity under this section is to provide funding to K-12 schools and institutions of higher education to make repairs, modernize and make renovations to meet green building standards. The Leadership in Energy and Environmental Design (LEED) Green Building Rating System, developed by the U.S. Green Building Council (USGBC), addresses green standards for schools that include bicycle and pedestrian facilities and access to schools.

Another $5 billion is provided for the Energy Efficiency and Block Grant Program. This provides formula funding to cities, counties and states to undertake a range of energy efficiency activities. One eligible use of funding is for bicycle and pedestrian infrastructure.

State Sources

State Highway Account

Section 157.4 of the Streets and Highways Code requires Caltrans to set aside $360,000 for the construction of non-motorized facilities that will be used in conjunction with the State highway system. The Office of Bicycle Facilities also administers the State Highway Account fund. Funding is divided into different project categories. Minor B projects (less than $42,000) are funded by a lump sum allocation by the CTC and are used at the discretion of each Caltrans District office. Minor A projects (estimated to cost between $42,000 and $300,000) must be approved by the CTC. Major projects (more than $300,000) must be included in the State Transportation Improvement Program and approved by the CTC. Funded projects have included fencing and bicycle warning signs related to rail corridors.

Caltrans Active Transportation Program (ATP)

The Active Transportation Program was created by Senate Bill 99 (Chapter 359, Statutes 2013) and Assembly Bill 101 (Chapter 354, Statutes 2013) to encourage increased use of active modes of transportation, such as biking and walking. The ATP consolidates existing federal and State transportation programs, including the Transportation Alternatives Program (TAP), Bicycle Transportation Account (BTA), and State Safe Routes to School (SR2S), into a single program with a focus to make California a national leader in active transportation. The ATP is administered by the Division of Local Assistance, Office of Active Transportation and Special Programs. This is a competitive program to:

- Increase biking and walking trips
- Increase safety
- Increase mobility
- Support regional agency GHG reduction
- Enhance public health
- Benefit disadvantaged communities (25 percent)
- Include a broad spectrum of projects

Streets and Highways Code Bicycle Transportation Account (BTA)

The Bicycle Transportation Account (BTA) funds nonmotorized facilities and access to cities and counties that have adopted bikeway master plans. Section 2106 (b) of the Streets and Highways Code transfers funds annually to the BTA from the revenue derived from the excise tax on motor vehicle fuel. The Caltrans Office of Bicycle Facilities administers the BTA.

For a project to be funded from the BTA, the project shall:

i) Be approximately parallel to a State, county, or city roadways, where the separation of bicycle traffic from motor vehicle traffic will increase the traffic capacity of the roadway; and

ii) Serve the functional needs of commuting cyclists; and

3) Include but not be limited to:

- New bikeways serving major transportation corridors;
- New bikeways removing travel barriers to potential bicycle commuters;
- Secure bicycle parking at employment centers, park and ride lots and transit terminals;
- Bicycle carrying facilities on public transit vehicles;
- Installation of traffic control devices to improve the safety and efficiency of bicycle travel;
- Elimination of hazardous conditions on existing bikeways serving a utility purpose;
- Project planning
- Preliminary and construction engineering

Maintenance is specifically excluded from funding and allocation takes into consideration the relative cost effectiveness of the proposed project.

Transportation Development Act Article 3 (Senate Bill 821)

TDA funds are based on a ¼ percent State sales tax, with revenues made available primarily for transit operating and capital purposes. By law, the Riverside County Auditor's office estimates the apportionment for the upcoming fiscal year.

TDA Article 3 funds may be used for the following activities related to the planning and construction of bicycle and pedestrian facilities:

- Engineering expenses leading to construction
- Right-of-way acquisition
- Construction and reconstruction
- Retrofitting existing bicycle facilities to comply with ADA requirements
- Route improvements, such as signal controls for cyclists, bicycle loop detectors and rubberized rail crossings
- Purchase and installation of bicycle facilities such as improved intersections, bicycle parking, benches, drinking fountains, rest rooms, showers adjacent to bicycle paths, employment centers, park-and-ride lots, and/or transit terminals accessible to the general public

Local Sources

Developer Impact Fees

As a condition for development approval, municipalities can require developers to provide certain infrastructure improvements, which can include bikeway projects. These projects have commonly provided Class 2 facilities for portions of on-street, previously planned routes. They can also be used to provide bicycle parking or shower and locker facilities. The type of facility that should be required to be built by developers should reflect the greatest need for the particular project and its local area. Legal challenges to these types of fees have resulted in the requirement to illustrate a clear nexus between the particular project and the mandated improvement and cost.

New Construction

Future road widening and construction projects are one means of providing on-street bicycle facilities. To ensure that roadway construction projects provide bicycle lanes where needed, it is important that the review process includes input pertaining to consistency with the proposed system. Future development in the City will contribute only if the projects are conditioned.

Restoration

Cable TV and telephone companies sometimes need new cable routes within public rights of way. Recently, this has most commonly occurred during expansion of fiber optic networks. Since these projects require a significant amount of advance planning and disruption of curb lanes, it may be possible to request reimbursement for affected bicycle facilities to mitigate construction impacts. In cases where cable routes cross undeveloped areas, it may be possible to provide for new bikeway facilities following completion of the cable trenching, such as sharing the use of maintenance roads.

Other Sources

Local sales taxes, fees and permits may be implemented as new funding sources for bicycle projects. However, any of these potential sources would require a local election. Volunteer programs may be developed to substantially reduce the cost of implementing some routes, particularly multi-use paths. For example, a local college design class may use such a multi-use route as a student project, working with a local landscape architectural or engineering firm. Work parties could be formed to help clear the right of way for the route. A local construction company may donate or discount services beyond what the volunteers can do. A challenge grant program with local businesses may be a good source of local funding, in which the businesses can "adopt" a route or segment of one to help construct and maintain it.

Private Sources

Private funding sources can be acquired by applying through the advocacy groups such as the League of American Bicyclists and the Bikes Belong Coalition. Most of the private funding comes from foundations wanting to enhance and improve bicycle facilities and advocacy. Grant applications will typically be through the advocacy groups as they leverage funding from federal, State and private sources.

Tables 19 to 22 on the following pages summarize many of the numerous funding sources available.

Table 18: Federal Funding Sources

Federal Sources					
Grant Source	**Annual Total**	**Agency**	**Funding Cycle**	**Match**	**Remarks**
Land and Water Conservation Act of 1965 (LWCF)	$450 million federal; $3.6 million CA (2012)	National Parks Service/California Department of Parks and Recreation	Dec-Jan	50% + 2-6% admin. surcharge	Funding subject to north/south split (60% for Southern California). Fund provides matching grants to state and local governmentsfor land acquisition and development for outdoor recreation use. Individual project awards are not available.
MAP-21 - Surface Transportation Program (STP)	$10 billion Federal; $888 million CA (pre-set-aside, pre-penalty)	FHWA/Caltrans	June 1	20%	STP funds wide variety of bicycle and pedestrian improvements, including on-street bicycle facilities, off-street trails, sidewalks, crosswalks, bicycle and pedestrian signals, parking and other ancillary facilities. May be exchanged for local funds for non-federally certified local agencies. No match required if project improves safety.
MAP-21 - Transportation Alternatives Program (TAP) Includes Trails and SRTS Programs	$820 million Federal; $72.5 million CA	FHWA/SANDAG	Annual	20%	Funds construction, planning and design of facilities for pedestrians, bicyclists and other non-motorized forms of transportation.
MAP-21 - Recreational Trails Program	$5.75 million guaranteed (set aside from TAP)	FHWA, Regional agency may also contribute	Annual	Federal + Regional must not exceed 95%	Percentage of TAP funding allocated to Recreational Trails Program at discretion of State.
MAP-21 - National Highway Performance Program	$1.9 billion (pre-set-aside, pre-penalty)	FHWA/Caltrans	Not available	Federal 80%-100%; State 0%-20%	Program provides funding for construction and maintenance projects located on newly expanded National Highway System (NHS), including those related to bicycle and pedestrian infrastructure. Certain safety projects may have a federal cost share of up to 100%.

Table 18: Federal Funding Sources

Federal Sources					
Grant Source	**Annual Total**	**Agency**	**Funding Cycle**	**Match**	**Remarks**
MAP-21 - Highway Safety Improvement Program (HSIP)	$2.4 billion Federal; $197 million CA (pre-set-aside, pre-penalty)	FHWA/Caltrans		Federal 90%; State 10%	Projects must address safety issues and may include education and enforcement programs. Program includes Railroad-Highway Crossings and High Risk Rural Roads programs. Bicycle projects must provide high degree of safety.
MAP-21 - Congestion Mitigation and Air Quality (CMAQ)	$464 million CA (pre-set-aside, pre-penalty)	FHWA/Caltrans	April	20%	Amount of CMAQ funds depends on state's population share and on degree of air pollution
MAP-21 - Safe Routes to School Program (SRTS)	$21 million (2012 Funding; see remarks section for more information)	Federal Highway Administration (FHWA) Caltrans and then MPO (SANDAG)		80% Federal; 20% State	Caltrans proposed funding SRTS from a $21 million set aside in STP, approved by CTC as one year policy. Future funding for SRTS will be determined through the MAP-21 implementation process.
Rivers, Trails and Conservation Assistance Program (RTCA)		National Park Service	August		Expenditures include bikeway plans, corridor studies and trails assistance
Energy Efficiency and Block Grant Program	$3 million	Department of Energy			Provided formula funding for cities, counties and states to take part in energy efficient activities
Community Development Block Grants (CDBG)	$3 million	HUD & CA Dept of Housing & Com. Dev.	Ongoing	10%	Funds improve land use and transportation infrastructure in low-income neighborhoods or citywide for accessibility improvements.
Federal Lands Highway Program	$611 million 2008-10	FLH/FHWA	Ongoing	Varies	May be used to build bicycle and pedestrian facilities in conjunction with roads and parkways at discretion of grantee.
Land and Water Conservation Fund (LWCF)	$30 million in 2010	NPS/California Department of Parks and Recreation	Annual	50%	LWCF grants may be used for statewide outdoor recreational planning and for acquiring and developing recreational parks and facilities, especially in urban areas.

Federal Sources					
Grant Source	**Annual Total**	**Agency**	**Funding Cycle**	**Match**	**Remarks**
MAP-21 – Pilot Transit-Oriented Development Planning Program	$10 million	Federal Transit Administration	Not available	Not available	Provides funding to advance planning efforts that seek to increase access to transit hubs for pedestrian and bicycle traffic.
Map-21 - Associated Transit Improvements	1% of the Urbanized Area Formula Grant; for FY2014 that would be 1% of 4.5 Billion (~ $45 million)	Federal Transit Administration/ MPO	Not available	80% Federal Assistance (Capital); 50% Federal Assistance (Operational)	Recipients of Section 5307 (Urbanized Area Formula Grants) must certify they are spending no less than 1 percent of their federal transit funds on associated transit improvements (formerly transit enhancements). Typical projects have included bicycle lockers and parking near transit stations and stops.
Partnership for Sustainable Communities	$409 million in grants and/ or assistance in 2010	HUD/DOT/EPA	Ongoing	Not available	Funding for preparing or implementing regional plans for sustainable development.
Energy Efficiency and Conservation Block Grant Program	$3.2 Billion Federal; over $35 million CA	FHWA	June	None	Provides formula funding for cities, counties and states to take part in energy efficient activities.
Rivers, Trails and Conservation Assistance (RCTA) Program	Staff time is awarded for technical assistance	NationalParks Service	August 1 for the following year	N/A	Technical assistance offered for conservation of rivers and open space and development of trails and greenways.
Community Development Block Grant (CDBG)	$2 million for Planning and technical assistance in 2013	HUD & California Department of Housing and Community Development	Ongoing	Ongoing 90% Federal; 10% Local	Available for low-income neighborhoods to improve land use and transportation infrastructure. Can be used for citywide accessibility improvements.
Community Transformation Grants (CTG)	$35 million in 2012	Regional health and planning agencies	Not available	N/A	Funds to implement broad, sustainable strategies to reduce health disparities and expand preventive health care services.

Federal Sources					
Grant Source	**Annual Total**	**Agency**	**Funding Cycle**	**Match**	**Remarks**
Transportation Investment Generating Economic Recovery Program (TIGER)	$474 million Federal; $31 Million CA (2013)	US DOT	October	80% Federal; 20% State	Can be used for innovative, multi-modal and multi-jurisdictional transportation projects (including bicycle and pedestrian projects) that promise significant economic and environmental benefits to an entire metropolitan area, region or the nation. Minimum project cost is $10 million.
Bus and Bus Facilities Program: State of Good Repair	$2.17 billion Federal (2014)	Federal Transit Administration	March	80% Federal; 20% State	Can be used for projects to provide bicycle access to public transportation facilities. More specifically, funds are used for shelters for people, bicycle parking amenities and accommodating bicycles on transit.
Bus Livability Initiative	$125 million (2012)	Federal Transit Administration	March	90% Federal;10% State	Can be used for bicycle and pedestrian support facilities, such as bicycle parking, bicycle racks on buses, pedestrian amenities and educational materials.
Federal Lands Transportation Program, Category 3, "Alternative Transportation" (see remarks)	Pacific West Region was awarded $3.38 million (2013)	FHWA	Varies, generally October; programmed through 2017	None	Funds transportation modes that reduce congestion and pollution in parks and public lands. Formerly the Paul S. Sarbanes Transit in Parks Grant Program (repealed upon enactment of MAP-21).
Local Highway Bridge Program	$300 million	FHWA/Caltrans	Ongoing	88.53% Fed. Match for Local Highways; 100% for Fed. Highways	Funds to replace or rehabilitate public highway bridges over waterways, other topographical barriers, other highways, or railroads.
Section 5310	$20-$35 annually	Federal Transit Administration	Annually	11.47%	Assists private, non-profit corporations and public agencies in providing transportation services to meet needs of seniors and persons with disabilities for whom public transportations services are otherwise unavailable, insufficient or inappropriate.

Table 19: State Funding Sources

State Sources					
Grant Source	**Annual Total**	**Agency**	**Funding Cycle**	**Match**	**Remarks**
State Highway Account (SHA): Bicycle Transportation Account (BTA)	Varies	Caltrans	March application deadline. Consult Local Assistance Office	10%	Must have an adopted Bicycle Transportation Plan. Funding available for all phases of projects.
Active Transportation Program	$124 million/ year	Caltrans	Two-year cycle	12%	Consolidates BTA, Transportation Alternatives and Safe Routes to School funding. 60% awarded by State, 40% by MPOs.
Transportation Development Act (TDA) Section 99234	$149 in 2014	Local MPO or CTC	Annually	None	2% of TDA total, funds for bicycle and pedestrian projects.
Regional Improvement Program (STIP)	$3.4 billion over 5-years	Caltrans	Every two years		Capital improvement projects (planning and rideshare activities).
AB-2766 Vehicle Registration Funds	$30 million in 2010	SCAQ	February	None	Competitive program for projects that benefit air quality.
Vehicle Registration Surcharge Fee (AB-434) RCF		APCB	July	None	Competitive program for projects that benefit air quality.
Vehicle Registration Surcharge Fee (AB-434) PMF	40% from grant source	APCB	April	None	Funds distributed to county communities based on population.
Developer Fees or Exactions	Project-specific	Cities	Ongoing	None	Mitigation required during land use approval process.
State Gas Tax (local share)		Allocated by State Auditor-Controller	Monthly allocation	None	Major Projects, >$300,000.
State and Local Transportation Partnership Program (SLPP)	Est. $200 million/yr. state-wide	Caltrans	Summer	50%	Road projects with bicycle lanes are eligible, requires developer or traffic fee match.
Caltrans Minor Capital Program	Varies	Caltrans	Ongoing after July 1	None	Projects must be on state highways; such as upgraded bicycle facilities.
Environmental Enhancement and Mitigation Program (EEM)	$10 million/ yr. state-wide	State Resources Agency	October annually	None required, but favored	Individual grants limited to $350K.

State Sources					
Grant Source	**Annual Total**	**Agency**	**Funding Cycle**	**Match**	**Remarks**
Petroleum Violation Escrow Account (PVEA)	Varies	Caltrans, CA Community Services and Development, Air Resources Board	March	None	Projects must save energy, provide public restitution and be approved by CA Energy Commission and US DOE.
Community Based Transportation Planning Demonstration Grant Program	$3 million annually	Caltrans	November	20%	Projects must have a transportation component or objective.
Habitat Conservation Fund Grant Program (HCF)	$2 million	CA Dept of Park and Recreation	October	50%	Available until July 1, 2020.
Office of Traffic Safety Program (OTS)	Varies	Office of Traffic Safety	January	None	Goal to reduce vehicle fatalities and injuries through safety program to include education, enforcement and engineering.
Safe Routes to School Program (SR2S)	$24 million in 2009*	Caltrans	April	10%	Eligible for projects in vicinity of a school and grades K-12.
State Transportation Improvement Program (STIP)	Varies	Caltrans	Every 4 years	None	Gives metropolitan regions more control over state transportation fund investment.
California Conservation Corps (CCC)		California Conservation Corps			CCC provides emergency assistance and public service conservation work.
Environmental Justice (EJ) Planning Grants	$9 million in 2010	Caltrans	Annually	10%	Engage low-income and minority communities in transportation projects to ensure equity and positive social, economic and environmental impacts.
California River Parkways	Varies	CA Natural Resources Agency	October	None	Create or expand trails for walking, bicycling and/or equestrian activities compatible with other conservation objectives.

Table 20: Local Funding Sources

Local Sources					
Grant Source	**Annual Total**	**Agency**	**Funding Cycle**	**Match**	**Remarks**
Parking Meter Districts		City	Annual Budget	N/A	Parking Meter Districts can use parking meter revenues for streetscape improvements such as pedestrian facilities, landscaping and lighting.
Transient Occupancy Tax (TOT)		City	Annual Budget	None	Created to cover expenses and improvements related to tourism and to encourage more tourists to visit. Fund may be appropriate in areas of heavy tourism such as along waterfronts, major parks and historic neighborhoods.
SB-821	Varies	Riverside County Transportation Commission (RCTC)	Annually	Up to 25%	Eligible projects include sidewalks, bicycle paths, lanes and routes, and access ramps or curb cuts.
Measure A	$400 million/year	Riverside County Transportation Commission (RCTC)	Annually	None	Western County, public transit includes funding for specialized transit, commuter rail, intercity bus service, and commuter assistance.
SCAG Sustainability Program	Varies	SCAG	Annually	None	Direct funding of innovative planning initiatives for member agencies through Compass Blueprint Demonstration Projects.
SCAG Active Transportation	Varies	SCAG	Annually	11.47%	New division intended to assist bicycle and pedestrian planning efforts. Program will focus on voluntary efforts to meet local needs and contribute to implementing SCS, reducing greenhouse gas (GHG) emissions.

Table 21: Private Funding Sources

Private Sources					
Grant Source	**Annual Total**	**Agency**	**Funding Cycle**	**Match**	**Remarks**
SRAM Cycling Fund	$400,000+/yr	SRAM	Ongoing	None	*www.sramcyclingfund.org*
Surdna Foundation	Project-specific	Surdna Foundation	Ongoing	None	Surdna Foundation makes grants to nonprofit organizations in areas of environment, community revitalization, effective citizenry, arts, and the nonprofit sector.
Bikes Belong	$180,000 annually	Bikes Belong Coalition	Three times a year	50%	Community grants focus on funding facilities and programs. *www.bikesbelong.org*
Kaiser Permanente Community Health Initiatives	$54 million annually	Kaiser Permanente	Ongoing	None	Numerous programs to support Healthy Initiatives.
Health Foundations		Various foundations	Ongoing		Focus active transportation improvements for an obesity prevention strategy. Examples include California Wellness Foundation, Kaiser and California Endowment.
Rails to Trails Conservancy		Rails to Trails Conservancy			Provides technical assistance for converting abandoned rail corridors to use as multi-use trails.
Donations		Depends on nature of project	Ongoing		Corporate or individual donations, sponsorships, merchandising or special events.
In-kind Services		Depends on nature of project	Ongoing		Donated labor and materials for facility construction or maintenance such as tree planting programs or trail construction and maintenace.
People for Bikes Community Grant Program	Up to $10,000	People for Bikes	Twice a year	None	Focuses most grant funds on bicycle infrastructure projects such as bicycle paths, lanes, trails and bridges, mountain bike facilities, bike parks and pump tracks, BMX facilities, end-of-trip facilities such as bicycle racks, parking and storage.

Appendices

A: Design Guidelines
B: Suitability Model and Project Prioritization
C: Community Input Summary
D: Count Summary
E: California Streets and Highways Code Section 891.2 Compliance

Class 1 Multi-use Paths

Class 1 facilities are generally paved multi-use paths, separated from motor vehicle traffic. Off street routes are rarely constructed for the exclusive use of cyclists since other non-motorized user types will also find such facilities attractive. For that reason, the facilities recommended in this master plan should be considered multi-use where cyclists will share the pathways with other users. Recommended Class 1 paths are intended to provide commuting and recreational routes unimpeded by motor vehicle traffic.

By law, the presence of a Class 1 route near an existing roadway does not justify prohibiting bicycles on the parallel or nearly parallel roadway. Where a bikeway master plan calls for Class 1 routes parallel to the alignments of planned roadways, these roadways should still be designed to be compatible with bicycle use. Two reasons to retain parallel facilities are that an experienced cyclist may find Class 1 paths inappropriate because of intensive use, or the routes may not be direct enough. By the same token, the Class 1 path will likely be much more attractive to less experienced cyclists than a parallel facility on the adjacent street.

In general, Class 1 facilities should not be placed immediately adjacent to roadways. Where such conditions exist, Class 1 facilities should be offset from the street as much as possible and separated from it by a physical barrier. These measures are intended to promote safety for both the cyclists and the vehicle drivers by preventing unintended movement between the street and the Class 1 facility.

Common Issues

A Class 1 bicycle facility is located within its own separate right-of-way, with no motor vehicle traffic permitted. However, Class 1 facilities are typically shared with other users, such as pedestrians or equestrians. The common issues associated with the design of Class 1 facilities include:

At-grade Crossings – While Class 1 facilities are located on exclusive right-of-way, most must deal with at-grade crossings at roadways or railways. At-grade crossings present several challenges, including safety issues and conflicts with automobile traffic operations. Most bicycle related collisions occur at at-grade crossings.

Shared Use Issues – Class 1 facilities are multi-use and not for the exclusive use of cyclists, which can create conflicts between different user types, particularly due to speed differentials. Conflicts between different user types are especially likely to occurs on regionally significant recreational paths that attract a broad diversity of users.

Compatibility of Equestrian Use – Joint use paths by cyclists can pose problems due to the ease of which horses can be startled. Also, the requirements of a Class 1 bikeway facility include a solid surface, which is not desirable for horses.

Safety – Safety issues have come up within some communities regarding Class 1 bicycle facilities. Class 1 bicycle facilities are typically separated from public areas, resulting in the perception of increased crime or an unsafe environment.

Obstacles – Obstacles are a common issue and may include sign posts, light standards, utility poles and other similar appurtenances that impede travel.

Opportunities and Potential Treatments

At-Grade Crossings

Several design options exist for making at-grade crossings safer. The main objective is clear signage to minimize confusion between conflicting modes of travel. Crossings should be implemented at all at-grade crossings to clearly show that cyclists or other users may be crossing. Flashers are also helpful, especially at night to notify vehicle drivers of the crossing. The installation of a signalized crossing is preferred. Approaches should be somewhat offset to slow users as they near the intersection. (See example at right.) These guidelines should be applied to all at-grade crossings, such as on proposed creek and railway corridors.

Class 1 bicycle path at-grade crossing - San Diego, CA

Shared Use Issues of Class 1 Facilities

In general, paths expected to receive heavy use should be a minimum of 14 feet wide, paths expected to experience moderate use should be at least 12 feet wide and low volume paths can be 10 feet wide. Caltrans Class 1 requirements call for eight feet as the minimum width with two foot clear areas on each side. Methods used to reduce path conflicts have included providing separate facilities for different groups, restricting certain uses to specific hours, widening existing facilities or marking lanes to regulate flow. Examples of all of these types of actions occur along southern California's coastal paths where conflicts between different user types can be especially severe during peak periods.

Path with marked pedestrian and bicycle lanes - Long Beach, CA

Compatibility of Equestrian Use

Joint use of paths by cyclists and equestrians can pose problems due to the ease with which horses can be startled. Also, the requirements of a Class 1 multi-use facility include a solid surface, which is not desirable for horses. Therefore, where either equestrian or cycling activity is expected to be high, separate routes are recommended. On facilities where Class 1 designation is not needed and the facility will be unpaved, mountain bikes and horses can share the trail if adequate passing zones are provided, the expected volume of traffic by both groups is low and available sight distances allow equestrians and cyclists to see and anticipate each other. Education of all path users in "trail etiquette" has also proven to be successful on shared paths.

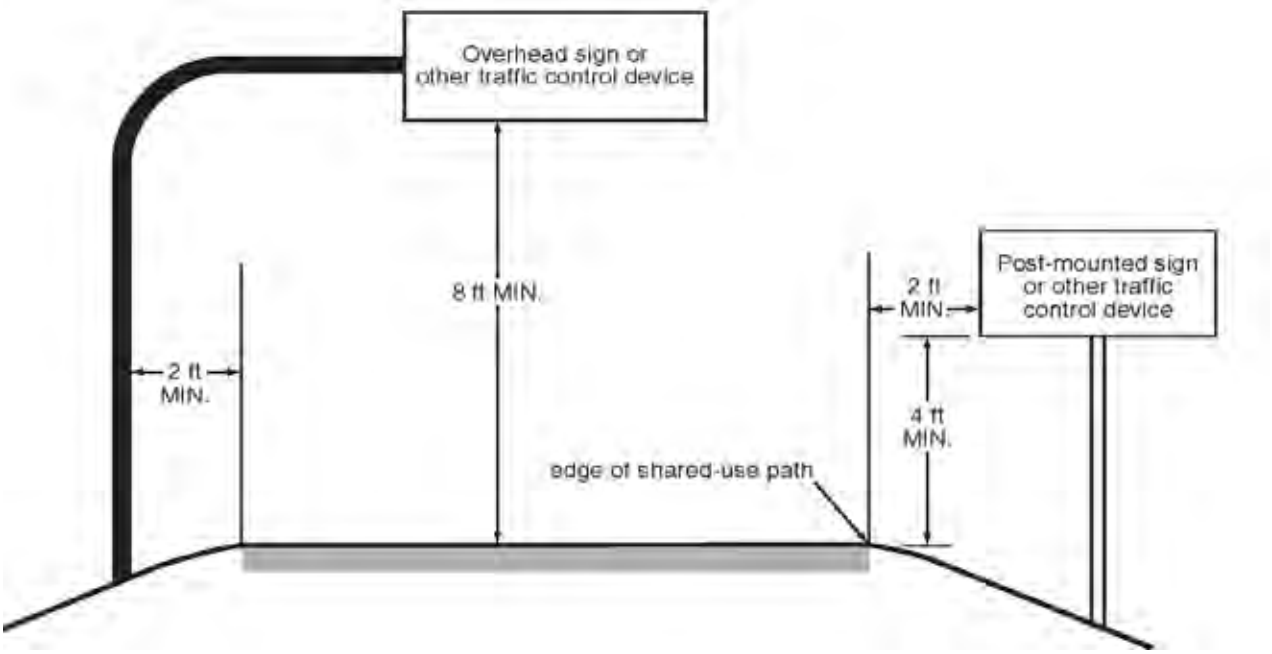
Class 1 multi-use path and adjacent horse trail - San Diego, CA

Safety

The Delaware Center for Transportation and the State of Delaware Department of Transportation studied the impacts of Class 1 multi-use paths to neighborhoods in relation to safety and crime (*Project Report for Property Value/Desirability Effects of Bicycle Paths Adjacent to Residential Areas* – 2006). Examining multi-use paths in 12 communities across North America, the study concluded that crime on such paths is minimal and must be considered in perspective with the typical risks associated with other similar activities. Minimizing crime on paths involves ensuring that users exercise proper safety precautions and that managers maintain the path and support path use. The amount of crime in and around recreational facilities is generally correlated with the amount of crime in the neighboring area, and not a direct result of the path itself.

Obstacles

To make certain that as much of the paved surface as possible is usable by bicycle traffic, obstructions such as sign posts, light standards, utility poles and other similar appurtenances should be set back with at least a two foot minimum "shy distance" from the curb or pavement edge, with exceptions for guard rail placement in certain instances. A three foot minimum is recommended. Additional separation distance to lateral obstructions is desirable. Where there is insufficient paved surface width to accommodate bicycle traffic, any placement of equipment should be set back far enough to allow room for future projects (widening, resurfacing) to bring the pavement width into conformance with these guidelines when the opportunity arises. Vertical clearance to obstructions should be a minimum of eight feet. Where practical, vertical clearance of 10 feet is desirable.



Sign placement on shared-use paths (MUTCD Figure 9B-1)

Permeable Pavement for Class 1 Multi-Use Paths

Traditional impervious surfaces such as asphalt and concrete can be damaging to the local environment because stormwater running off them collects dirt and debris, and even oil from the asphalt itself, and washes these pollutants into streams, lakes and oceans. When stormwater runoff is not filtered through some form of treatment, it is directly transported into the local water system. Stormwater runoff is the leading source of pollutants entering our waterways.

An alternative to an impervious surface for multi-use paths is a pervious pavement such as porous concrete or asphalt. Porous pavement is especially useful for path segments that cannot be drained or are subject to periodic inundation. Its unique texture is composed primarily of angular aggregates such as crushed stone cemented together to create regular voids that allows water to flow directly downward to the underlying substrate. The exposed coarse aggregates provide enhanced traction for maintenance vehicles and bicycles and can prevent hazards such as hydroplaning. The textured surface is especially beneficial during the most difficult and dangerous of riding conditions, such as during rainfall, since water does not remain on the surface and cause flooding. However, some road cyclists feel that the coarse surface can be too rough for very skinny tired bicycles. Also, this type of paving requires regular maintenance to function properly, such as periodic vacuuming.

Markings and Striping

Marking and striping are used to indicate the separation of directional lanes on multi-use paths.

- A yellow center line stripe is recommended where paths are heavily used, where sight distances are restricted, and on some unlit paths where night time riding is expected. The line should be dashed when adequate passing sight distance exists, and solid when no passing is recommended.
- A solid white line is recommended for separation of pedestrian traffic and bicycle/in-line skating traffic.
- Solid white lines along the edge of paths are recommended where nighttime riding is expected.
- Markings should be retroreflective.
- Consideration should be given to selecting pavement marking materials that will minimize loss of traction for bicycles in wet conditions.

Note that Section 9C.03 of the MUTCD leaves the application of marking and striping of a Class 1 path optional.

Sign R81 (CA MUTCD)

Sign R81-A (CA MUTCD)

Sign R81-B (CA MUTCD)

Class 2 Bicycle Lanes

This facility provides a striped lane for one-way bicycle travel on a street or highway, installed along streets in corridors where there is significant bicycle demand, and where there are distinct needs that can be served by them. In streets with on-street parking, bicycle lanes are located between the parking area and the traffic lanes.

Common Issues

Class 2 facilities are located on highways and must share the road with motor vehicles. The most common issue associated with Class 2 bicycle lanes is safety. Traveling adjacent to motor vehicles, especially along high speed corridors, increases the risk of motor vehicle and bicycle-related collisions and injuries. Other safety issue concerns include:

- Freeway interchanges – slower bicycle traffic can often conflict with high speed vehicles entering and exiting freeways.
- Parking lanes – bicycle lanes are typically located between the parking lane and vehicle traffic lane, which creates unsafe conditions when vehicle drivers are attempting to park.
- Limited Right-of-Way – roadways ideal for bicycle lanes, but with limited right-of-way can be an issue. Many roadways suitable for Class 2 bicycle lanes are located adjacent to residential or commercial uses that allow on-street parking.
- Visibility – visibility of cyclists on roadways or at intersections, especially freeway ramps.

Design Guidelines

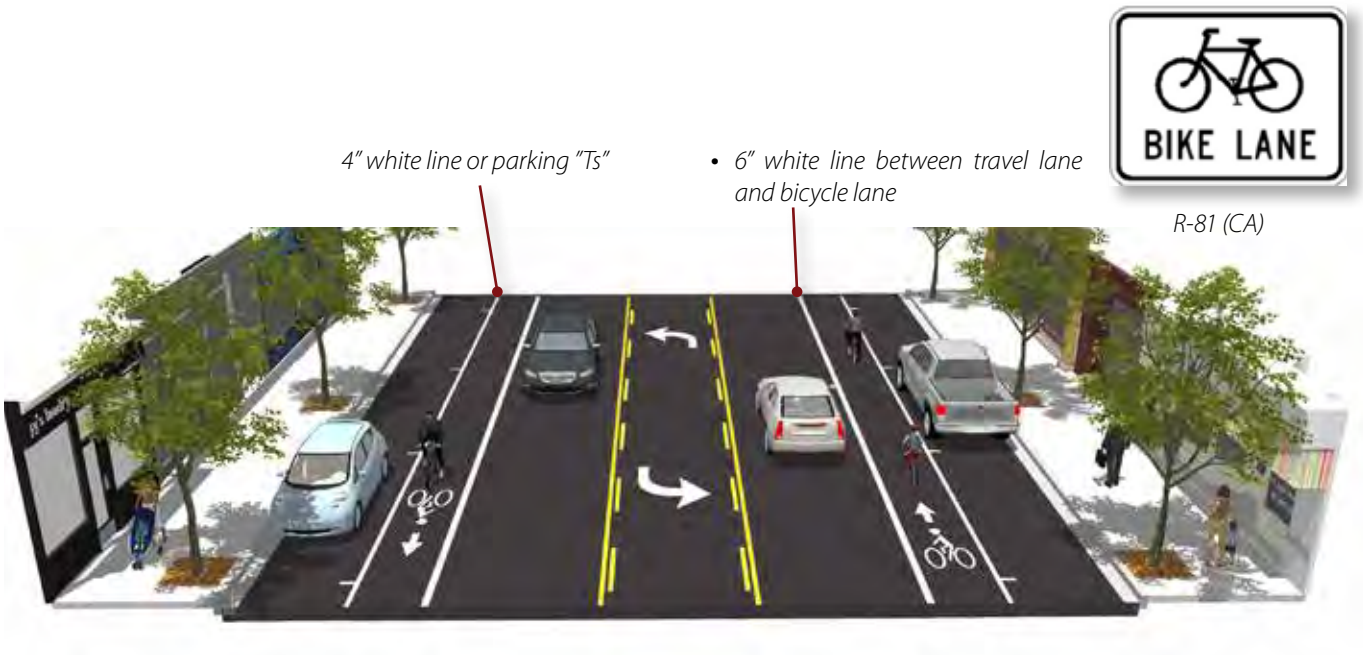
- Provide five foot minimum width for bicycle lanes located between parking and traffic lanes. Six feet is desired.
- Provide four foot minimum width if no gutter exists. With a normal two foot gutter, minimum bicycle lane width is five feet, with 36" outside of gutter.

Recommendations

- Bicycle lanes are not advisable on long, steep downgrades, where bicycle speeds greater than 30 miles per hour are expected. If lanes are used, additional width should be provided to accommodate higher bicycle speeds.
- If parking volume is substantial or turnover high, an additional one to two feet of width is desirable.
- If six feet is available for a bicycle lane, it is preferred to maintain the six feet if adjacent to a curb with no on-street parking present. With on-street parking, stripe a four foot bicycle lane with a two foot buffer between the bicycle lane and on-street parking.

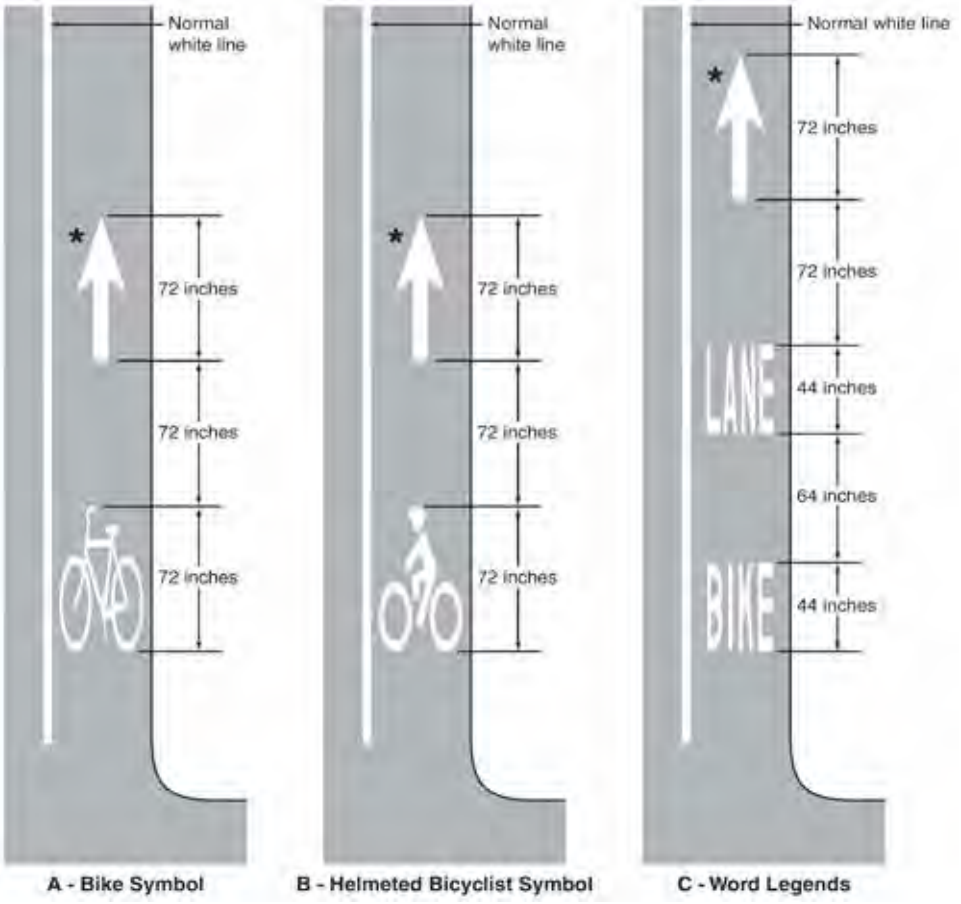
Optional Class 2 Bicycle Lane Enhancements

- Colored bicycle lanes
- Distinct and unique directional signage
- Traffic calming, such as curb extensions, street trees and landscaping, designed to increase pedestrian and bicycle safety
- Traffic control devices for bicycles at major intersections



Bicycle Lane Pavement Markings

The following is the suggested pavement signage for bicycle lanes from the California MUTCD.



Bicycle lane markings (CA MUTCD Figure 9C-3)

** Arrows optional (but preferred)*

References

Caltrans HDM Chapter 300, California MUTCD 2012

NACTO Urban Bikeway Design Guide, 2012

Model Design Manual of Living Streets, 2011

Colored Bicycle Lanes

Color is applied to bicycle lanes to enhance the visibility of cyclists on bicycle lanes and the bicycle lanes themselves. Color can be applied to the entire bicycle lane or at high-risk locations where vehicle drivers are permitted to merge into or cross bicycle lanes.

Design Guidelines

- Signage and dimensional guidelines are the same as for standard Class 2 bicycle lanes.
- Avoid using blue, which is commonly designated for disabled facilities. Green has become the standard color for colored bicycle lanes.

Recommendations

- Provide additional signage with matching color.
- Use color and markings consistently.
- Consider different coloring materials based on the location of the bicycle lanes, amount of traffic, roadway and weather conditions.

References

Innovative Bicycle Treatments: An Informational Report - ITE Pedestrian and Bicycle Council

Portland's Blue Bike Lanes: Improved Safety through Enhanced Visibility – City of Portland, 1999

NACTO Urban Bikeway Design Guide, 2012

Green lane and merge zone - Riverside, CA

Buffered Bicycle Lanes

Additional space between the bicycle lane and traffic lane, parking lane or both provide a more protected and comfortable space for cyclists than a conventional bicycle lane.

Design Guidelines

- Signage and dimensional guidelines are the same as for standard Class 2 bicycle lanes.
- Provide an additional 2-4 foot buffer or "shy zone" between the bicycle lane and parking lane. If space allows, buffering between the traffic lane and bicycle lane may also be provided (dual buffering), but buffering between parked vehicles and the bicycle lane should be given priority.
- Where no parking occurs and space allows, provide a buffer between the travel lane and bicycle lane.
- Line closest to bicycle lane may be dashed.
- "Bott's dots" are not generally recommended in buffer zones, but if used, should be linearly spaced 6-8 feet apart so as not to deter cyclists from entering and exiting.

Recommendations

- Add diagonal striping on the outer buffer adjacent to the vehicle travel lanes every six feet.
- On-street parking remains adjacent to the curb.
- A travel lane may need to be eliminated or narrowed to accommodate buffers.

References

NACTO Urban Bikeway Design Guide, 2012

Buffered bicycle lane - San Diego, CA

Dual buffered bicycle lane - San Diego, CA

Back-in Diagonal Parking

The back-in/head-out parking is considered safer than conventional head-in/back-out parking due to vehicle drivers having better visibility when pulling out. This is particularly important on busy streets or where vehicle drivers may find their view blocked by large vehicles or by tinted windows in adjacent vehicles.

Design Guidelines

Based on existing dimensions from test sites and permanent facilities, provide 16 feet from curb edge to inner bicycle lane stripe of a five foot bicycle lane.

Recommendations

Test the facility on streets with existing head-in angled parking and moderate to high bicycle traffic. Additional signs to direct vehicle driver in how the back-in angled parking works is recommended.

References

Back-in/Head-out Angle Parking, Nelson/Nygaard Consulting Associates, 2005

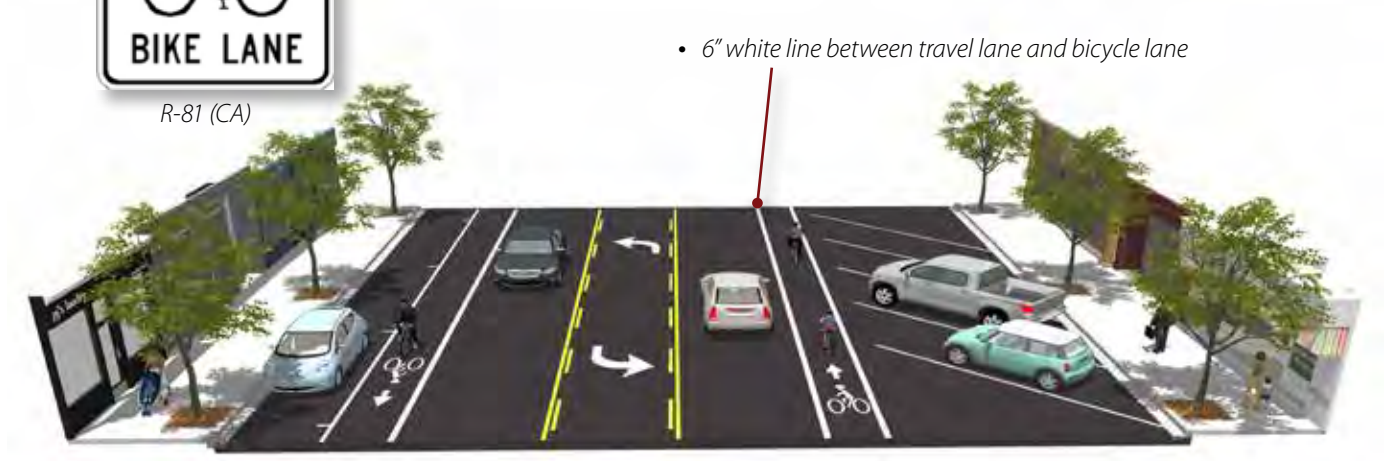
City of Los Angeles Bicycle Plan Update, City of Los Angeles

Note: This design treatment is not currently present in any State or federal design standards. However, it is now a standard configuration in Seattle, WA and is being widely adopted elsewhere.

Instructional signage - Solana Beach, CA

Back-in/head-out angle parking - Bridgeport, CA

R-81 (CA)



Bicycle lane with back-in/head-out angle parking

Class 3 Bicycle Routes

The following are typical guidelines, as well as enhanced treatments for installing bicycle routes. Other treatments not listed in these guidelines may be considered on a case-by-case basis when warranted. Common issues associated with Class 3 facilities are similar to Class 2 facilities, but Class 3 facilities are generally located on roadways with lower speeds and lower traffic volumes. Class 3 facilities are designated as roadways with no striped bicycle lanes, but include signage to indicate that cyclists are allowed and should be expected. The most common issue associated with Class 3 facilities is signage visibility.

Signing

When designating a bicycle route, the placement and spacing of signs should be based on the *California Manual on Uniform Traffic Control Devices, Part 9: Traffic Controls for Bicycle Facilities*. For bicycle route signs to be functional, supplemental plaques can be placed beneath them when located along routes leading to high demand destinations (e.g. "To Downtown," "To Transit Center," etc.) Since bicycle route continuity is important, directional changes should be signed with appropriate arrow sub-plaques. Signing should not end at a barrier. Instead, information directing the cyclist around the barrier should be provided. If used, route signs and directional signs should be used frequently because they promote reasonably safe and efficient operations by keeping road users informed of their location.

"BIKE ROUTE" - This sign is intended for use where no unique designation of routes is desired. However, when used alone, this sign conveys very little information. It can be used in connection with sub-plaques giving destinations and distances. (See Section 1003-3 of the *Caltrans Highway Design Manual* and Part 9B-20 of the MUTCD for specific information on sub-plaque options.)

Roadways appropriate for bicycle use, but are undesignated, usually do not require regulatory, guide or informational signing in excess of what is normally required for vehicle drivers. In certain situations, however, additional signing may be needed to advise both vehicle drivers and cyclists of the shared use of the roadway, including the travel lane.

Class 3 bicycle route - Oceanside, CA

Sign D11-1 (CA MUTCD)

Sign SG45 (CA MUTCD)

Sign D1-1b (R) (CA MUTCD)

"Share the Road" - This sign is recommended where the following roadway conditions occur:

- Shared lanes with relatively high posted travel speeds of 40 mph or greater.
- Shared lanes in areas of limited sight distance.
- Situations where shared lanes or demarcated shoulders or marked bicycle lanes are dropped or end and bicycle and motor vehicle traffic must begin to share the travel lane.
- Steep descending grades where bicycle traffic may be operating at higher speeds and require additional maneuvering room to shy away from pavement edge conditions.
- Steep ascending grades, especially where there is no paved shoulder, or the shared lane is not adequately wide and bicycle traffic may require additional maneuvering room to maintain balance at low operating speeds.
- High volume urban conditions, especially those with travel lanes less than the recommended width for lane sharing.
- Other situations where it is determined to be advisable to alert vehicle drivers of the likely presence of bicycle traffic and to alert all traffic of the need to share available roadway space.

"Bicycles May Use Full Lane" (BMUFL) - This sign (R4-11) sign may be used:

- On roadways where there are no bicycle lanes or adjacent shoulders usable by cyclists and where travel lanes are too narrow for cyclists and motor vehicles to safely operate side-by-side.
- In locations where it is important to inform all roadway users that cyclists may occupy the travel lane.

Shared Lane Markings (next page) may be used in addition to or instead of BMUFL signs to inform road users that cyclists may occupy the travel lane. Both the Share the Road and BMUFL signs are recommended on most Class 3 routes. (Note: A new "Shared Road" sign is becoming the accepted standard instead of the "Share the Road" sign.)

Sign W16-1 and W11-1 (CA MUTCD)

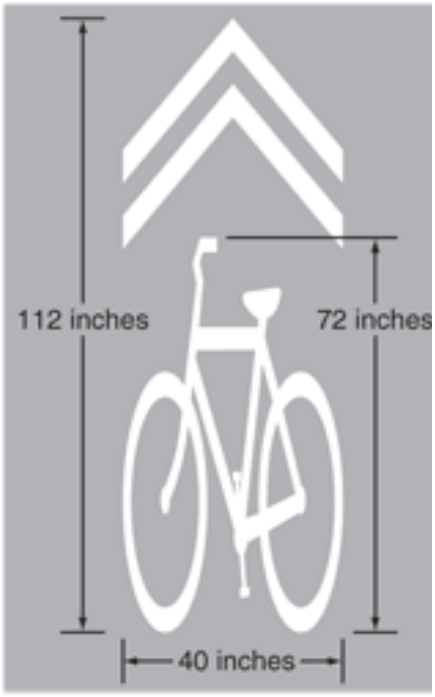
Sign R4-11 (CA MUTCD)

Share the Road sign - San Clemente, CA

Class 3 Bicycle Route Enhancements

Shared Lane Marking or "Sharrow" Design Criteria

The shared lane marking (SLM) is commonly used where parking is allowed adjacent to the travel lane. The center of the marking should be located a minimum of 11 feet from the curb face or edge of the road. If used on a street without on-street parking that has an outside travel lane less than 14 feet wide, the centers of the Shared Lane Markings should be at least four feet from the face of the curb, or from the edge of the pavement where there is no curb. (Note that these criteria are evolving and that it is now common practice to center SLMs within the typical vehicular travel route in the rightmost travel lane to ensure adequate separation between cyclists and parked vehicles.)



Shared lane marking (CA MUTCD Figure 9C-9)

Design Considerations

Shared lane markings may be considered in the following situations:

- On roadways with speeds of 35 mph or less (CA MUTCD).
- On constrained roadways too narrow to stripe with bicycle lanes.
- To delineate space within a wide outside lane where cyclists can be expected to ride.
- On multi-lane roadways where cyclists can be expected to travel within outside lanes and vehicle drivers should be prepared to change lanes to pass cyclists.
- On roadways where it is important to increase vehicle driver awareness of cyclists.
- On roadways where cyclists frequently ride the wrong way.
- On roadways where cyclists tend to ride too close to parked vehicles.

Green striped lane with shared lane markings - Long Beach, CA)

Recommendations

Shared lane markings should be paired with the Bicycles May use Full Lane signs (R4-11) or Shared Road sign.

Further enhancements, such as a green striped lane throughout the Shared Lane Marking zone, is another upgrade employed by cities such as Long Beach and Salt Lake City.

Shared lane marking - Oceanside, CA

References

Caltrans HDM Chapter 300

California MUTCD 2012

NACTO Urban Bikeway Design Guide, 2012

Model Design Manual of Living Streets, 2011

Cycle Tracks

A cycle track is a combination between a bicycle lane and shared-use path. This facility can be both two-way or one-way depending on existing road conditions, intersections and adjacent land use. The cycle track is a separate facility adjacent to a pedestrian sidewalk and physically protected from an adjacent travel lane. This treatment reduces the risk of conflicts between cyclists, pedestrians and parked vehicles.

Design Guidelines

- One way cycle track: 6.5 feet minimum desired.
- Two-way cycle track: 12 feet minimum desired.
- Cycle track buffer: three feet minimum desired.
- This facility separates cyclists from the road through either parked cars, planting strips, bollards, raised medians, or a combination of these elements.
- Can be placed on lower speed urban streets or streets with high ADTs and speed, but they should have with long blocks and little to no driveways or mid-block vehicular access points.

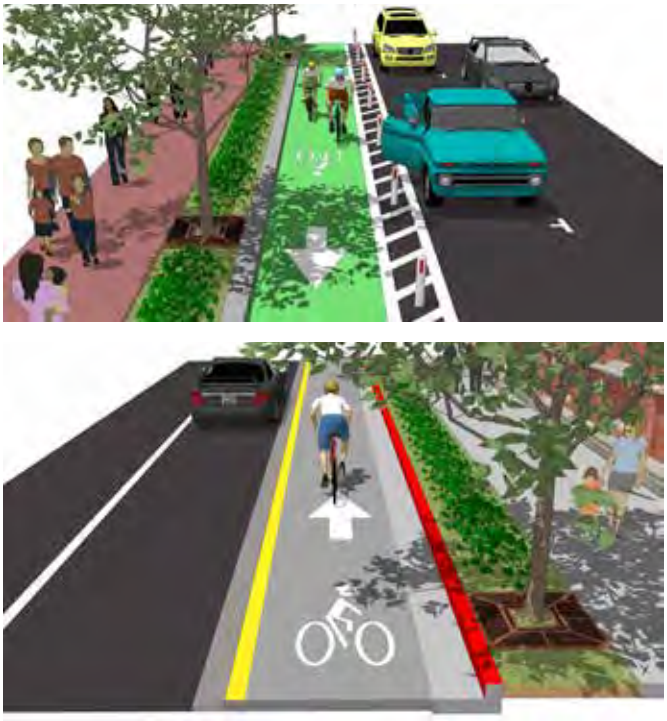
Recommendations

- Additional signage, traffic control treatments and pavement markings is needed to direct cyclists along cycle track and intersection.
- Priority needs to be on cyclist safety through intersections and minimizing vehicular/cyclist conflict points.

References

Innovative Bicycle Treatments: An Informational Report - ITE Pedestrian and Bicycle Council

NACTO Urban Bikeway Design Guide, 2012



Cycle track examples

(Upper image illustrates buffered and colored configuration and lower illustrates raised configuration)

Cycle track - Long Beach, CA

Bicycle Boulevards

The purpose of creating bicycle boulevards is to provide a primary bicycle friendly route to improve safety and convenience of cycling on local streets. Bicycle boulevards are typically used on residential streets parallel to nearby arterial roads on routes that have high or potentially high bicycle traffic. A bicycle boulevard is a roadway available to vehicle drivers, but prioritizes bicycle traffic through the use of various treatments. Motor vehicle traffic volume is reduced by periodically diverting vehicles off the street and the remaining traffic is slowed to the same speed as bicycles. Bicycle boulevards are most effective when several treatments are used in combination. The design features associated with a Bicycle Boulevard can help:

- Increase pedestrian, cyclist and overall community feelings of comfort and safety.
- Increase cycling and walking.
- Improve wayfinding.
- Discourage neighborhood cut-through traffic.
- Calm and reduce neighborhood traffic.
- Provide shade for pedestrians and cyclists.
- Create a pleasant corridor through City center.

Recommended Enhancements

- Provide directional signage and/or special street sign design at all intersections.
- Provide continuous "Bicycle Boulevard" signage along route.
- Increased pavement markings and/or unique pavement markings such as colored bicycle lanes, Shared Lane Markings ("Sharrows") or "Bicycle Boulevard" pavement legends.
- Periodically re-route vehicular traffic off street without affecting emergency vehicle response.
- Limit stop signs and signals to greatest extent possible except where they help cyclists maneuver through busy intersections.
- Alter major intersections with bicycle sensors, crossing actuators, directional signage. Other treatments for intersections can include traffic circles, bulb-outs and high visibility crosswalks.
- Add street trees and landscaping.
- Route design, amenities and signage must be consistent throughout entire bicycle boulevard.
- Install bicycle parking at applicable locations along route.

Bicycle boulevard/roadway intersection treatment with signalized diagonal bicycle crossing - San Luis Obispo, CA

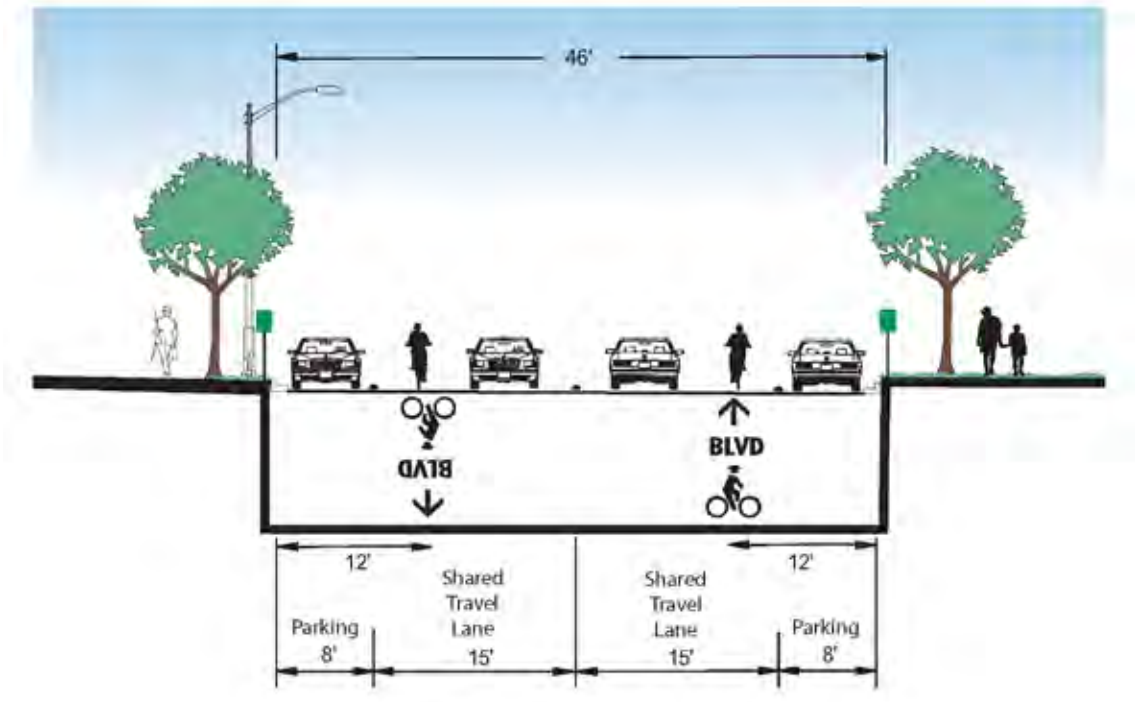
Bicycle boulevard pavement markings - San Luis Obispo, CA

Some optional Class 3 Bicycle Route enhancements for a bicycle boulevard include:

- Sharrows or Bicycle Boulevard pavement markings.
- Traffic calming (curb extensions, roundabouts, street trees and speed tables) designed to increase pedestrian and bicycle safety.
- Distinct and unique directional signage.
- Traffic control devices for bicycles at major intersections.
- Street trees and landscaping.

General Signage Guidelines

- Signs are a distinctive color to distinguish them from other traffic and road signs.
- Signs are made with retro-reflective material for improved visibility.
- Lettering on signs may be no less than two inches high.
- Provide bicycle system maps at hubs and near bicycle boulevard intersections.
- Place destination and distance signs every quarter mile, prior to signalized intersections, and in the block prior to the junctions with other bicycle facilities.
- Place bicycle boulevard identification signs at least at every other corner.
- Avoid obscuring vegetation or other visual impediments.
- Where wrong-way riding is known to occur, install DO NOT ENTER signs with the bicycle symbol, as well as informational signage citing applicable codes and dangers of wrong-way cycling.



Cross section with bicycle boulevard pavement markings

Pavement Markings

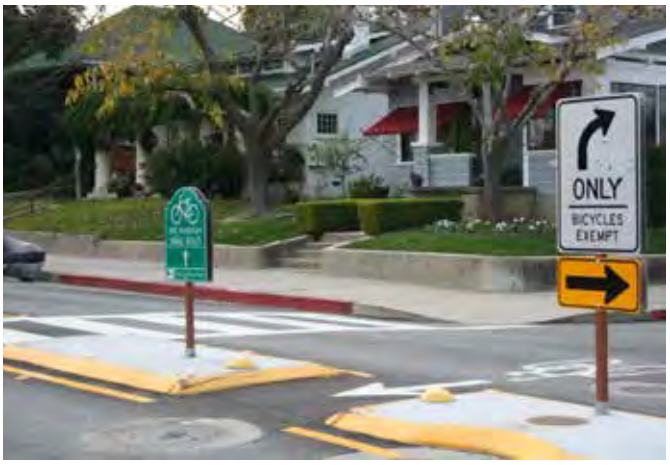
If bicycle lanes are the preferred alternative, they should be installed to meet Caltrans requirements. For further enhancements to the bicycle lanes, the inside of the lane can be painted green for further visibility. Some cities have used blue bicycle lanes, but they have since come under scrutiny because the ADA color designation is also blue. As a result, green has become the bikeway color standard.

Bicycle boulevard pavement markings are car-sized white pavement markings that depict a bicycle, the abbreviation of "BLVD" and a directional arrow. These markings are applied directly to the roadway surface in the center of the drive lane with four to six inch wide white paint striping. Markings should be placed in each direction of traffic following every intersection, near high volume driveways or other potential conflict points, and at no more than 200 foot intervals. Where the bicycle boulevard turns or jogs, arrows should be turned 45 or 90 degrees in the appropriate direction to help aid in way-finding.

Bicycle boulevard pavement markings can also inform vehicle drivers and cyclists of the end of the boulevard. When needed, these should be located in the same location as standard pavement markings to provide sufficient advance warning for cyclists to make appropriate decisions prior to the change. Advance warning 500 and 200 feet prior to the end of the end of a bicycle boulevard can be indicated on the pavement surface with "END" replacing the arrow and a count in feet until the end of the boulevard.

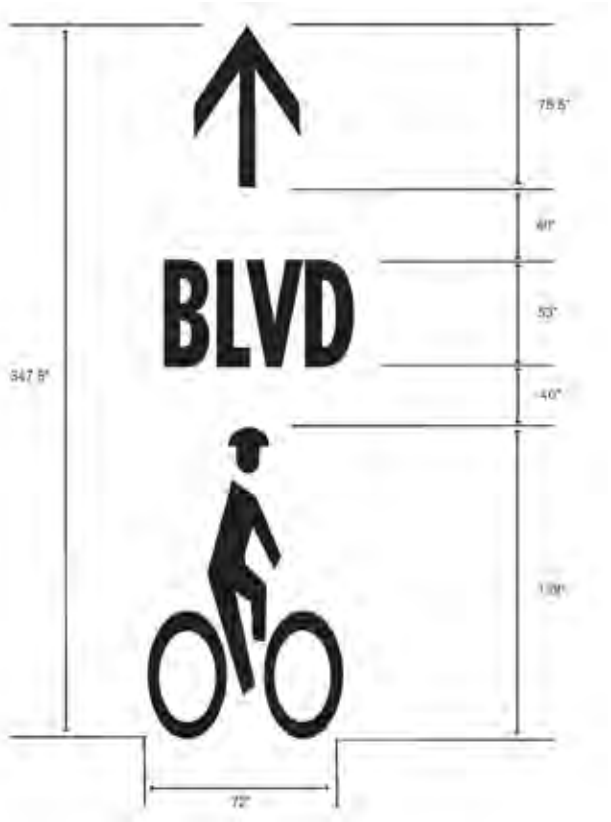
These symbols are to be used where bicycle lanes do not exist. With on-street parking, place the symbol twelve feet from curb face (measured to center of legend). Without on-street parking, place in center of the travel lane.

Note: Bicycle boulevard symbols are not a standard in the CA MUTCD. The diagram at right shows measurements for the symbol used in Berkeley, California.



Bicycle boulevard traffic diverters - San Luis Obispo, CA

Bicycle boulevard traffic circle - Long Beach, CA



Bicycle boulevard pavement marking - (Source: City of Berkeley, CA.)

Traffic Control Devices

As legitimate roadways users, cyclists are subject to essentially the same rights and responsibilities as vehicle drivers. Traffic control devices must be selected and installed to take their needs into account and should be placed so cyclists properly positioned on the roadway can observe them.

Traffic Signals and Detectors

Traffic actuated signals should accommodate bicycle traffic. Detectors for traffic activated signals should be sensitive to bicycles, should be located in the cyclist's expected path and stenciling should direct the cyclist to the point where the bicycle will be detected.

Since detectors can fail, added redundancy in the event of failure is recommended in the form of pedestrian push buttons at all signalized intersections. These buttons should be mounted in a location that permits their activation by a cyclist without having to dismount.

It is common for bicycles to be made of so little ferrous metals that they may not be easily detectable by some currently installed types of loop detectors. As an convenience for cyclists, the strongest loop detection point should be marked with a standard symbol.

Where left turn lanes are provided and only protected left turns are allowed, bicycle sensitive loop detectors should be installed in the left turn lane. Where moderate or heavy volumes of bicycle traffic exist, or are anticipated, bicycles should be considered in the timing of the traffic signal cycle as well as in the selection and placement of the traffic detector device. In such cases, short clearance intervals should not be used where cyclists must cross multi lane streets. According to the 1991 AASHTO *Guide for the Development of Bicycle Facilities*, a bicycle speed of 10 mph and a perception/reaction time of 2.5 seconds can be used to check the clearance interval. Where necessary, such as for particularly wide roadways, an all red clearance interval can be used.

In general, for the sake of cyclist safety, protected left turns are preferred over unprotected left turns. In addition, traffic signal controlled left turns are much safer for cyclists than left turns at which vehicle drivers and cyclists must simply yield. This is because vehicle drivers, when approaching an unprotected left turn situation or planning to turn left at a yield sign, tend to watch for other vehicles and may not see an approaching cyclist. More positive control of left turns gives cyclists an added margin of safety where they need it most.

Video Detection

A video detection setup consists of a video detector, usually mounted on a riser pole or a mainline pole, and a computer with video image-processing capability. Video detection can pick up a cyclist's presence at an intersection over a large area. These systems have a flexible detector layout allowing for easy reprogramming of detection zones. Video detection technology has advanced to detect bicycles with the same accuracy as loop detectors.

Advantages to video detection over loop detection include the ability to adjust signal timing once activated to allow cyclists sufficient time to cross the intersection. Cameras can detect bicycles that do not contain iron, unlike many loop detectors, and in some cases can detect pedestrians fairly well. Video detection is also not affected by resurfacing work and may even be used to help direct traffic during construction.

Bicycle detector symbol (CA MUTCD Figure 9C-7)

Bicycle Signals

A bicycle signal is an electrically powered traffic control device that may only be used in combination with an existing traffic signal. They are typically used at intersections with heavy bicycle traffic, in conjunction with high peak vehicle traffic volumes, high conflict intersections or at the connections of shared use bicycle lanes and busy roadways.

These signals separate conflicting movements between pedestrians, vehicles and cyclists. Bicycle signals also provide priority movement for cyclists at intersections and alternates right-of-ways between the different road users.

Bicycle signals direct cyclists to take specific actions and may be used to improve an identified safety or operational problem involving cyclists.

Only green, yellow and red lighted bicycle symbols are used to implement bicycle movement at a signalized intersection. The application of bicycle signals is implemented only at locations that meet Caltrans bicycle signal warrant criteria. A separate signal phase for bicycle movement is used.

Alternative means of handling conflicts between cyclists and motor vehicles should be considered first. Two alternatives that should be considered are:

Bicycle signals - Tucson, AZ

- Striping to direct cyclists to a lane adjacent to a traffic lane such as a bicycle lane to left of a right-turn-only lane
- Redesigning intersection to direct cyclists from an off-street path to a bicycle lane at a point removed from signalized intersection

A bicycle signal must meet warrant criteria before being considered for installation based on the following formula:

1. Volume; When **W = B x V** and **W** > 50,000 and **B** < 50.

   Where:

   W is the volume warrant

   B is the number of bicycles at the peak hour entering the intersection

   V is the number of vehicles at the peak hour entering the intersection

   (B and V shall use the same peak hour)

2. Collision: When two or more bicycle/vehicle collisions of types susceptible to correction by a bicycle signal have occurred over a 12 month period and the responsible public works official determines that a bicycle signal will reduce the number of collisions.

3. Geometric: (a) Where a separate bicycle/multi-use path intersects a roadway. (b) At other locations to facilitate a bicycle movement that is not permitted for a motor vehicle.

References

California MUTCD 2012

NACTO Urban Bikeway Design Guide, 2012

Bicycle Parking Facilities

Whenever possible, racks should be placed within 50 feet of building entrances where cyclists would naturally transition to pedestrian mode. The rack placement would ideally allow for visual monitoring by people within and around the building. Rack placement should minimize conflicts with both pedestrians and vehicle traffic. All bicycle parking should be on a solid surface and located a minimum of two feet from any parallel wall, and four feet from a perpendicular wall (as measured to the closest center of the rack).

The following text and graphics focus on outdoor installations using racks intended to accommodate conventional, upright, single-rider bicycles and a solid, U-shaped lock, or a cable lock, or both.

Custom bicycle rack - Oceanside, CA

Custom bicycle rack - San Diego, CA

Rack Element

The rack element is the part of the bicycle rack that supports one bicycle. It should support the bicycle by its frame in two places, prevent the front wheel from tipping over, allow the frame and one or both wheels to be secured, and support bicycles with unconventional frames.

"Inverted-U" and similar type racks are most recommended because each element can support two bicycles. Commonly used "wave" type racks are not recommended because they support the bicycle at only one point. Also, cyclists often park their bicycles parallel with such racks, instead of perpendicular as intended, which effectively reduces the rack capacity by half.

The rack element must resist being cut or detached using common hand tools, especially those that can be concealed in a backpack. Such tools include bolt cutters, pipe cutters, wrenches and pry bars. Square tubing is highly recommended.

Rack

The rack itself is one or more rack elements joined on a common base or arranged in a regular array and fastened to a common mounting surface.

The rack elements may be attached to a single framework or remain single elements mounted in close proximity. They should not be easily detachable from the rack framework or easily removed from the mounting surface. The rack should be anchored so that it cannot be stolen with the bicycles attached, such as with vandal-resistant fasteners.

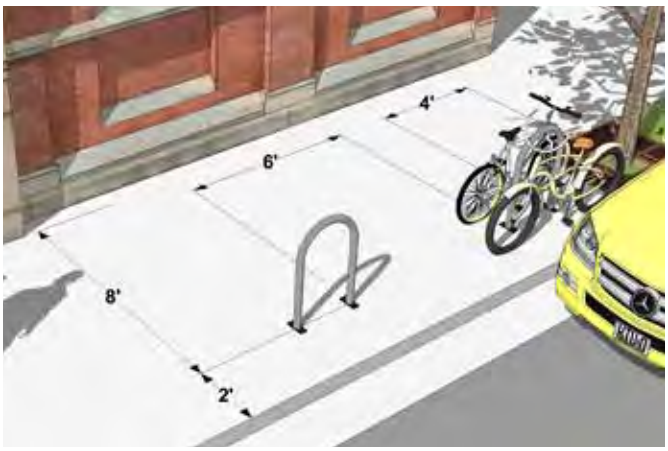
The rack should provide easy, independent bicycle access. Typical inverted-U rack elements mounted in a row should be placed on 30" centers. Normally, the handlebar and seat heights will allow two bicycles to line up side-by-side in opposite directions. If it is too inconvenient and time-consuming to squeeze the bicycles into the space and attach a lock, cyclists will look for alternative places to park or use one rack element per bicycle and reduce the projected parking capacity by half.

Rack Area

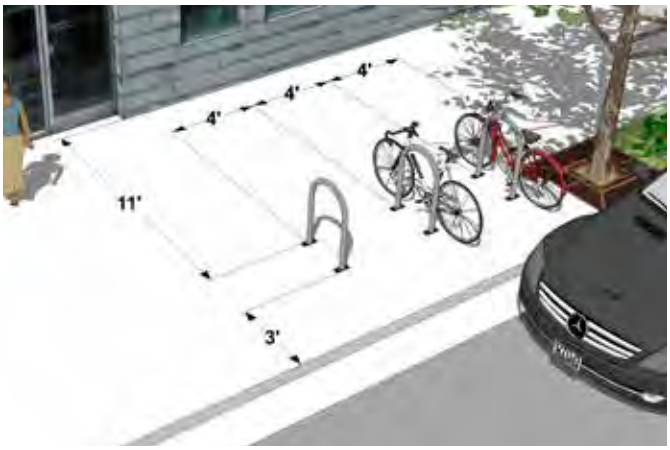
The rack area is a bicycle parking lot where multiple racks are separated by aisles. The distance between aisles is measured from tip to tip of bicycle tires across the space between racks. The minimum separation between aisles should be two feet, which provides enough space for one person to walk one bicycle. In high traffic areas where many users park or retrieve bicycles at the same time, the recommended aisle width is six feet. The depth of each row of parked bicycles should also be six feet.

Large rack areas in high turnover areas should have more than one entrance. If possible, the rack area should be protected from the elements. Even though cyclists are exposed to sun, rain and snow while en route, covering the rack area keeps cyclists more comfortable while parking, locking their bicycles and loading or unloading cargo. A covering will also help keep bicycles dry, especially the saddles.

Bicycle rack dimensions for installations adjacent to walls



Bicycle rack dimensions for installations parallel to curb



Bicycle rack dimensions for installations perpendicular to curb

Rack Area Site

The rack area site is the relationship of a rack area to the building entrance or approach. In general, smaller, conveniently located rack areas should serve multiple buildings, rather than a larger combined, distant one. Racks far from the entrance or perceived to be where bicycles will be vulnerable to vandalism or theft will not receive much use.

Rack area location in relationship to the building it serves is very important. The best location is immediately adjacent to the entrance it serves, but racks should not be placed where they can block the entrance or inhibit pedestrian flow. The rack area should be located along a major building approach line and clearly visible from the approach.

The rack area should be no more than a 30 second walk (120 feet) from the entrance it serves and should preferably be within 50 feet. A rack area should be as close or closer than the nearest car parking space, be clearly visible from the entrance it serves and be near each actively used entrance. In some cases, an appropriate location may be within the adjacent right-of-way as a bicycle corral, as shown below.

Movable bicycle corral - Long Beach, CA

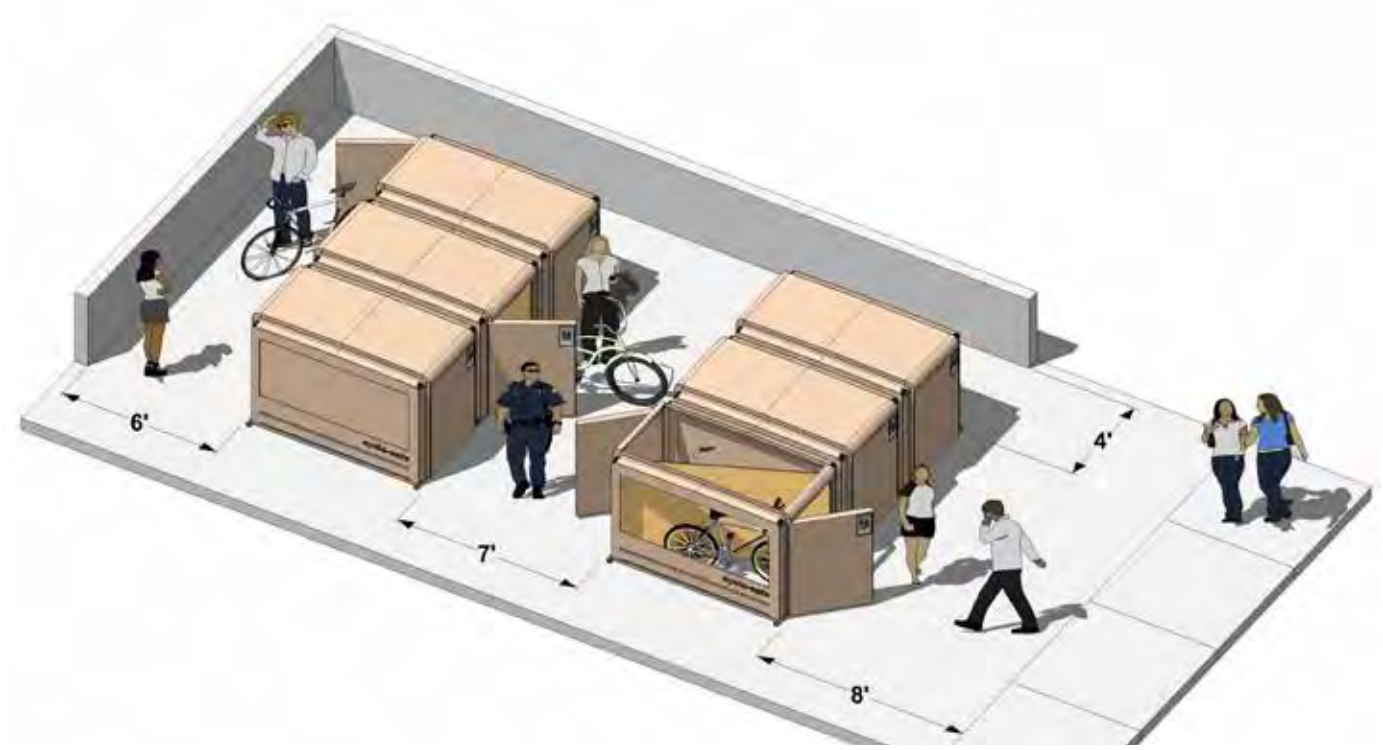
Bicycle corral dimensions - Converts one car parking space into 8-10 bicycle spaces

Long-term Parking

Bicycle parking facilities intended for long-term parking must protect against theft of the entire bicycle and its components and accessories. Three common ways of providing secure long-term bicycle parking are:

- Fully enclosed lockers accessible only by the user, either coin-operated, or by electronic, on-demand locks operated by "smartcards" equipped with touch-sensitive imbedded RFID chips.
- A continuously monitored facility that provides at least medium-term type bicycle parking facilities generally available at no charge.
- Restricted access facilities in which short-term type bicycle racks are provided and access is restricted only to the owners of the bicycles stored there.

Perhaps the easiest retrofit is the bicycle locker. Generally, they are as strong as the locks on their doors and can secure individual bicycles with their panniers, computers, lights, etc., left in place. Some bicycle locker designs can be stacked to double the parking density. Weather protection is another benefit. Bicycle lockers tend to be used most for long-term bicycle commuter parking in areas without continuous oversight. However, lockers with coin-operated locks can be a target of theft and may attract various unintended uses. This can be mitigated by installing lockers with mesh sides to allow periodic inspection.



Typical bicycle locker dimensions

Bicycle Suitability Model Overview

The Bicycle Suitability Model was developed to determine the most likely areas within the City of Moreno Valley where cyclists are likely to ride to and come from. The model was created to prioritize areas and projects to benefit the largest number of cyclists possible. The Bicycle Suitability Model identifies existing and potential bicycle activity areas citywide utilizing existing data within an extensive GIS database.

Bicycle Suitability Model Description

The overall model is comprised of three basic models: the Attractor, Generator and Detractor Models. When these three interim models are combined, they create the Bicycle Suitability Model.

The model identifies the characteristics of each particular area in geographic space and assigns a numeric value for each of these characteristics. The score per area is then added to create a ranking for that particular area in geographic space.

Attractor Model Methodology

The Bicycle Suitability Model identifies activity areas by utilizing cycling-related geographic features likely to attract cyclists. Typical bicycle and pedestrian commuter trips to nearby shopping centers, restaurants and work are very short, usually between 2-5 miles each way. More avid cyclists will commute over 20 miles round trip. School age children will normally ride or walk to school no more than a few miles round trip. The closer these attractors are to neighborhoods and primary cycling and pedestrian generators the more they are conducive for trips by bicycle or walking and are then given a higher weighting score. A one mile maximum distance in the model was given to encompass the majority of the shorter bicycle trips and maximum pedestrian trips. The many attractors are close enough that they would overlap within the mile.

The point scoring for the given attractors are based on a multitude of cycling and walking opportunities and bicycle amenities such as bicycle parking connections with other modes of transportation. For example, elementary schools are typically in neighborhoods to accommodate the younger population. Elementary school aged children are more likely to walk or rely on their bicycles as a mode of transportation to get to school compared to high school students who may hold a driver's license.

Attractor Inputs

- Elementary Schools
- Neighborhood Commercial (Local retail)
- Middle Schools
- Neighborhood Commercial
- Parks and Recreation
- Neighborhood Civic Facilities (Libraries, Post Office and Religious Facilities)
- Bus Stops
- High Schools and Colleges

Generator Model Methodology

The Bicycle Suitability Model also utilizes demographic data as indicators of potential volume of cyclists based on how many people live or work within the cycling activity areas identified in the Attractor Model. This particular component is called the Generator Model. Existing and projected total population and employment were used, as well as other demographic data such as age and use of public transportation. The weighted multiplier scores were derived from City staff and public input, previous applications of the model and the factors that most influence bicycle and walking trips within the City. Cycling and walking activity areas that contain a greater number of people living or working within them who are more likely to walk or ride their bicycle to these areas. The model uses U.S. Census Bureau Census Block Groups.

Generator Inputs

- Generator Mobility: People who bicycle to work
- Non-Vehicular Transportation: People who use public transportation to work
- No Vehicle Ownership
- Current Population Estimate
- Current Employment Estimate
- 2035 Population Estimate
- 2035 Employment Estimate

Barrier Model Methodology

Detractors discourage or detract people from riding their bicycles. Relevant factors are more related to the vehicular intensity and perceived safety of the cycling environment. Streets with high traffic volumes and high speeds tend to detract people from cycling and walking due to the amount of traffic adjacent to their route. Known areas of high bicycle and pedestrian related collisions are also a deterrent since people may reroute their trip to avoid certain streets and intersections where safety may be a concern. The point system and weighted multipliers were derived from City input, public input through previous surveys, past applications of the model and available City data.

Barrier Inputs

- Bicycle-related Collisions
- Freeway Crossings Related to Cycling Travel
- Traffic Volumes
- Speed Limits
- Slope and Canyons

Final Composite Model

The Bicycle Suitability Model then combines the Generators, Attractors and Detractors.

The Attractor, Generator, Barrier and Issues grid cell models were overlaid and these combined grid cells containing generator, attractor and detractor values were added to provide a total composite value for each combined cell. The composite value identifies areas that have a higher cycling activity point total. In some cases, the areas that have a high cycling activity score are areas that already have facilities, but further improvement can be made to enhance the cycling environment.

Bicycle Facility Priority Criteria and Implementation

The projects in this plan are a combination of planned and recommended bicycle facilities. Since the planned projects have yet to be implemented, prioritizing them along with the recommended projects subjects all of them to the same priority and implementation criteria. These projects were then itemized into Prioritized Projects, which are those that will have a significant impact on the existing bikeway system, such as closing major gaps and extending or developing multi-use paths, lanes or routes along major transportation corridors.

The following prioritization criteria were used to help identify which routes are likely to provide the most benefit to the City's bikeway system. The numbering used to identify projects within each bikeway facility class in the following sections does not necessarily imply priority. Bikeway facility implementation has no specific time line, since the availability of funds for implementation is variable and tied to the priorities of the City's capital improvement projects.

Bicycle Suitability Model (3 points total)

1. Suitability Scoring

The Bicycle Suitability Model acquires the routes total model score and is then divided by the acreage of that project. The average score per square feet is then calculated to normalize the score for all facilities. This allows projects with smaller footprints to have the same scoring parameters as larger projects. The breakdown in points is as follows:

- High: >54 = 3, Moderate: 42-53 = 2, Low: <42 = 1

Mobility and Access (9 points total)

2. Closes gap in significant route

- Closes a gap in an existing high bicycle traffic facility = 3
- Closes a gap in a non-existent high bicycle traffic facility = 2
- Closes a gap to connect facilities with bicycle use = 1

3. Linkage to Existing Bikeways

- Connects to 6 or more bikeways = 3
- Connects to 4-5 bikeways = 2
- Connects to 1-3 or less bikeways = 1

4. Physical Constraints: 1 – 3 points

Physical constraints include freeway crossings, interchanges, and railroad crossings that would require special or more costly physical treatments to implement.

- None = 3, 1-2 = 2, >2 = 1

Safety (9 points total)

5. Improves locations where bicycle collisions have occurred

- Fatal collisions have occurred directly on this route = 3
- Injury and non-injury related bicycle collisions have occurred on or near this route = 2
- No collisions have occurred on this route = 1

6. Improves routes with high vehicular traffic volumes

- Improves routes with high average daily trips (>20,000) = 3
- Improves routes with moderate average daily trips (10,000-20,000) = 2
- Improves routes with low average daily trips (<10,000) = 1

7. Bicycle Collision Rates (Collision per mile)

- >2 = 3, 1-2 = 2, <1 = 1

Regional Significance (3 points total)

8. Route has regional significance in the bikeway system

- High significance, connects major bicycle facilities and activity centers = 3
- Moderate significance, connects some routes and activity centers within the City = 2 *(Ex: Important internal connections to regional routes and major activity centers, schools and colleges)*
- Little significance, does not directly connect to activity centers, etc, but is still important in the bikeway system = 1 *(Ex: Project travels through neighborhoods and makes connections to other facilities)*

Public Support (3 points total)

9. Public Outreach Input

Public outreach was conducted for this plan in the form of an online survey and public workshops. City staff and members of the public were asked to identify the projects they feel were important by facility type.

- >6 points = 3, 3-6 points = 2, <3 points = 1

The maximum possible score is 27 points for all facility types. Proposed projects can be rated periodically at whatever interval best fits funding cycles or to take into consideration the availability of new information, new funding sources, updated crash statistics, etc. Bikeway facility prioritization and implementation should be fine-tuned and adjusted according to on future circumstances.

Appendix C: Community Input Summary

The following comments were compiled from the bicycle master plan's three public meetings, a draft recommendations comment map posted at a bicycle shop, and the online survey.

General Comments

- Would like good bike parking available at all important destinations; more secure bike parking at rail stations and places of employment (places where people will store bikes long-term)
- Preference for Class I paths; already riding aqueduct trail, but would prefer if it were contiguous
- Opportunity for a big, contiguious loop in the City? Some known identity to the loop?
- Driver education program for drivers (???) increase of bicyclists
- Use green paint on all bike routes
- Coordinate with WRCOG NEV Plan and corridors
- Death far east of city
- Road issues? Debris on road causign accidents. Lighting needs
- City street sweeping, add landscaping

Location-specific Comments

• Aqueduct Path	Bridges would be required along Eastern Aqueduct Path (Gentian and Chelbana is one instance, there are many others)
• SR-60 and Moreno Beach	Need multi-use freeway crossing
• Alessandro and Old 215	Drivers very aggressive, don't respect cyclists
• Alessandro	Trashed (at Allesandro and Heacock)
• Allesandro and Frederick	What are new industrial developments accommodating for bicyclists?
• Allessandro east of Davis	Road in very poor condition here
• Heacock and Ecualyptus	High foot traffic between Sunnymead Elem. and Middle and Sunnymeadows Elem and cars
• Box Springs, etc.	Provide connection to Riverside via Box Springs, Eastridge, Alessandro, Cactus and make at least 7' wide for future N.E.V.'s
• Bay Ave	Would like bike lane from Indian to Theodore
• Box Springs/Watkins	Class 2 on Box Springs to Watkins
• Cactus	Many cyclists (into MARB); Class I not feasible based on limited R.O.W. consider Class 2; 45mph speed limit, narrow, curves, fatal crash
• Cactus and I-215	I've seen a lot of bikes on this bridge. What are plans here?
• Cactus and Nason	Shift traffic from Hospital (Riverside County Regional Medical Center)
• Cottonwood and Redlands	Future logistical warehousing
• Davis south of Allessandro	Class I path to wildlife area
• El Potrero Park	Class I cannot go through El Potrero Park
• Elder and Nason	Connect class 2 to proposed Class I @ Elder
• Eucalyptus	Bike sensors or buttons for signal lights at freeway to give us more time
• Eucalyptus and Redlands	Loma Linda traffic, doctors, etc go on the hill
• Frederick	Upgrade to Class 2 to connect Ironwood and Cottonwood; Frederick at SR-60 is a nightmare
• Freeways	Freeway crossings for bikes and multi-use trails
• Future Metrolink Station	Would support Rail Trail along Metrolink Line between Moreno Valley and Riverside; What will connection be to station?
• Gentian	Trashed, hard to ride. Class I between Heacock and Indian
• Gilman Springs	Horrendous road! I'd never recommend it; Would love to see Class IV/Cycle track here
• Graham	A bike/ped bridge at Graham would be great; I can see people going out of their way a bit to use something like that

- Bird sanctuary, Mystic Lake
- Check future land use, logistics center
- Wide mulit-use paths, minimum 10'
- Road safety for drivers regarding bicycles
- Bicycle education needs - High school, elementary school kids
- Connections to neighboring cities
- Complete Streets mandate, ADA transition plan
- Future road expansions, on roads with speeds in excess of 30mph or volumes in excess of 5,000 (ADVT) should include Class I or IV facilities

• Grand Vista	Would like to see a bike lane here
• Heacock	Class 2 to connect Alessandro and Cactus; Class 2 between Cactus and Meyer/JFK; What will trails look like along Heacock toward Perris?
• Iris and Laselle	Why gap? Continue Class 2
• Ironwood, Lasselle to Nason	Dangerous stretch/continual crashes (narrow, winding road, drunk drivers, speeding)
• JFK	Road Diet/Bike Lanes on JFK between Cactus and Moreno Beach
• Juan de Anza Trail	Juan de Anza trail, National Park Service
• Kalmia	Like to see bike lane on this street, from Perris to its eastern terminus
• Kitching	Should be bike lane all along Kitching
• Kitching and Harley Knox	Connection to PVSC Multi-purpose trail
• Krameria near Laselle Elem	Road diet on Krameria
• Lake Perris	State Park Connection (2); Stay consistent to Perris Master Trail Plan
• Laselle	Upgrade to Class 2 for safety at Moreno Valley College; Probably too narrow for bike lanes
• Menifee	Menifee along 74 fatality
• Metrolink Trail	Would love to see this happen
• Moreno Beach	Moreno Beach from Juice it up (Moreno Beach and Trail Ridge) to Juice it up (Iris and Lasselle)
• Nason	Measure A funds; Good access over SR-60, Why gap between Cactus and Brodiaea?
• Nason and Cottonwood	Maybe school zone speed limit and flashers at day start and end
• North of SR-60	Opportunity for big loop north of SR-60
• Oliver	What about bike lane on Oliver?
• Perris	There should be bike lane running the whole length of Perris
• Perris and Ironwood	Connect stranded Class 2 with Perris north to Ironwood
• Perris to SR Parkway	Add bike lane to shopping center
• Pigeon Pass	Upgrade to Class 2 to provide connection Ironwood to Cottonwood
• Quincy	Would like to see bike lane from Locus to Cactus
• Schools	Connect all schools with bike lanes (Class 2)
• Sunnymead Ranch Lake	Would like good/low-stress route connecting Sunnymead Ranch Lake Shopping Center and adjacent neighborhoods
• Sunnymeade	Attempted to get Bike Friendly Business District designation
• UCR	Connecting to UCR; UCR people use train tracks for connection

Appendix C: Community Input Summary

The following are addresses to which the City sent notices concerning the bicycle master plan.

Local Bicycle Shops

- White's Bikes, 23750 Alessandro Boulevard
- Threshold Cycle, 24594 Sunnymead Ranch Parkway
- Rio Toys and Bike Shop, 25211 Sunnymead Boulevard

Nearby Bicycle Shops

- Jenson USA, 1615 Eastridge Avenue, Riverside
- Lake Perris BMX, 18700 Lake Perris Drive, Perris
- Woodcrest Bicycle Center, 16960 Van Buren Blvd, Riverside
- Pedals Bike Shop, 3765 Jurupa Avenue, Riverside
- Don's Bikes, 384 S. Riverside Avenue, Rialto

Churches

- Antioch Christian Church, 14161 Elsworth Street
- Asamblea Apostolica, 24903 Sunnymead Boulevard
- Banks Christian Bible Center, 24725 Alessandro Boulevard
- Breakthrough Church, 22620 Goldencrest Drive
- Calvary Baptist Church, 14137 Business Center Drive
- Calvary Chapel of Moreno Valley, 11960 Pettit Street
- Calvary Church, 22810 Alessandro Boulevard
- Centro Christiano Sinai, 12880 Heacock Street
- Christian Chapel Foursquare, 13793 Redlands Boulevard
- Church Of Christ, 12660 Indian Street
- Church of Jesus Christ of Latter Day Saints, 11557 Redlands Blvd
- Church of Jesus Christ of Latter Day Saints, 13281 Lasselle Street
- Church of Jesus Christ of Latter Day Saints, 23300 Old Lake Drive
- Come and See Baptist Church, 24528 Sunnymead Boulevard
- Convent Christian Center International, 24556 Eucalyptus Ave
- Crosswinds Church, 29263 Ironwood Avenue
- Discovery Christian Church, 27555 Alessandro Boulevard
- End Time Ministries, 13027 Perris Boulevard
- Faith Community Fellowship Baptist Church, 13027 Perris Blvd
- Family of God Church, PO Box 8197
- First Apostolic Faith Church, 24084 Postal Avenue
- First Assembly of God, 23525 Hemlock Avenue
- First Baptist Church, 13630 Edgemont Street
- First Baptist Church, 24765 Fir Avenue
- Foothill Baptist Church, 21401 Box Springs Road
- Grace Episcopal Church, 11349 Perris Boulevard
- Hammi Gungang Church, 22079 Goldenchain Street
- Harvest Time Christian, 14420 Elsworth Street
- Heavenly Bound Baptist Church, 14051 Indian Street
- Highway Church, 13958 Old 215 Frontage Road
- Hosanna Cambodian Evan. Church, 14139 San Cristobal Bay Dr
- Islamic Development Center, 24436 Webster Avenue
- Jehovah's Witnesses, 11818 Indian Street
- Jehovah's Witnesses, 27046 Alessandro Boulevard
- Lighthouse Baptist School, 12140 Indian Street
- Living Way Christian Fellowship, 12125 Day Street
- Lord Of Life Lutheran Church, 13600 Nason Street
- Moreno Christian Assembly, 13830 Nason Street
- Moreno Valley Baptist, 25560 Alessandro Boulevard
- Moreno Valley Presbyterian, 13027 Perris Boulevard
- Moreno Valley United Methodist Church, 10271 Heacock Street
- Moreno Valley Foursquare Church, 13793 Redlands Boulevard
- Morningstar Community Church, 14331 Frederick Street
- New Judah Christian Fellowship, 13373 Perris Boulevard
- New Life Christian Fellowship, 21160 Box Springs Road
- New Life Christian Fellowship, 24551 Ironwood Avenue
- New Life Missionary Baptist Church, 14051 Indian Street
- New Light Missionary Baptist, 16100 New Light Way
- New Wine Fellowship Church, 22640 Goldencrest Drive
- Oasis Community Church, 23750 Alessandro Boulevard
- Palm Canyon Community Church, 25550 Ironwood Avenue
- Power in Praise Christian Church, 24715 Sunnymead Blvd
- Power Ministries, 14420 Elsworth Street
- Quinn African Methodist Church, 25400 Alessandro Boulevard
- Redeemed Christian Church, 25595 Horado Lane
- Reformed Church in America, 13131 Wichita Way
- Rose of Sharon Evangelistic Church, 12900 Heacock Street
- Seventh-Day Adventist Church, 12649 Indian Street
- Shepherd of the Valley Lutheran Church, 11650 Perris Boulevard
- Sovereign Grace Orthodox Church, 12125 Day Street
- Spirit Dominion Praise Church, 13373 Perris Boulevard
- St Patricks Roman Catholic Church, 10915 Pigeon Pass Road
- Strong Tower Apostolic Church, 22405 Goldencrest Drive
- Strong Tower Church of God, 24771 Iris Avenue
- Temple of Miracles Foursquare, 24528 Sunnymead Boulevard
- Trinity Baptist Church, 29175 Ironwood Avenue
- Under the Yoke - Jesus Ministries, 24462 Peppermill Drive
- Valley Christian Church and Academy, 26755 Alessandro Blvd
- Victory by Faith, 14051 Indian Street
- Victory Outreach Church, 13630 Edgemont Street
- Victory Temple, 23932 Alessandro Boulevard
- Wesleyan Christian Fellowship, 13300 Indian Street
- Word of Life Christian Church, 23890 Alessandro Boulevard
- Zion Worship Center, 14325 Frederick Street

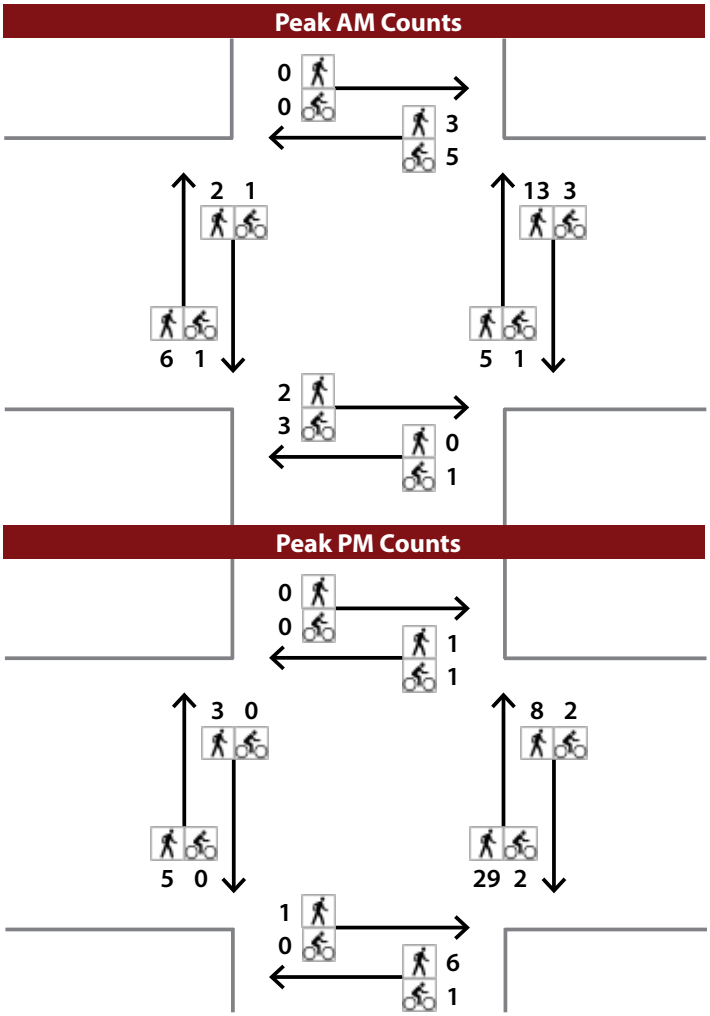
User counts can help to define and better understand cycling levels at locations citywide, to evaluate the impact of new facility development, policies or programs, and to better understand collision data through the calculation of crash rates per cyclist.

The National Bicycle and Pedestrian Documentation Project (NBPD) recommends a minimum of one count location per 15,000 residents for recurring counts, assuming that counts would typically occur annually (or seasonally) over a sequential one to three day period, and recommends counting at least once per year, preferably in September. The Southern California Association of Governments is developing a recommended bicycle count methodology and Moreno Valley should consider adopting it once it has been finalized.

The following summaries were from counts conducted at ten locations selected through discussion with City staff. Eight were standard morning and evening peak counts, and two were weekend mid-day counts to address anticipated high recreational use.

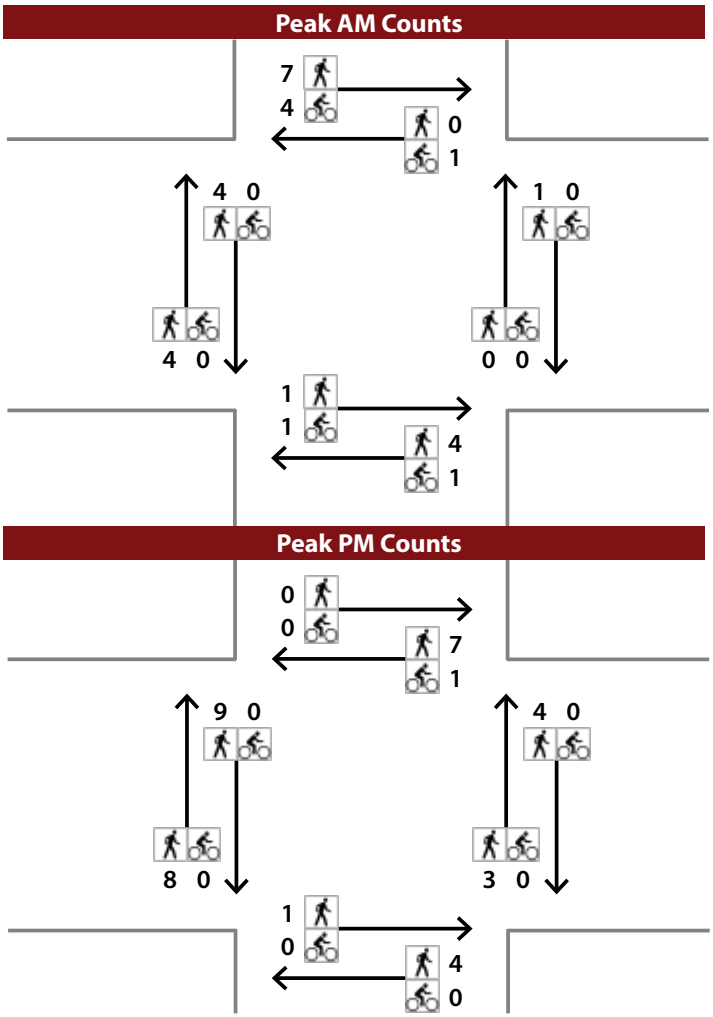
Pigeon Pass Road and Ironwood Avenue

Counts conducted 16 October 2013 at 15 minute intervals between 6:00 AM and 8:45 AM and between 2:30 PM and 5:15 PM



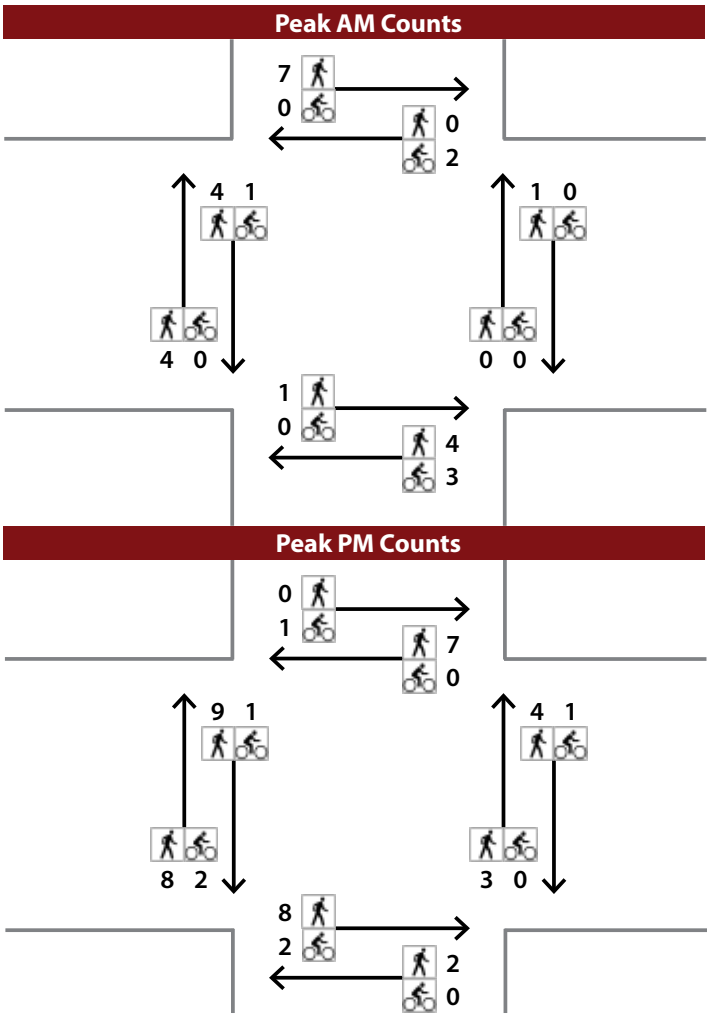
Perris Boulevard and Ironwood Avenue

Counts conducted 16 October 2013 at 15 minute intervals between 6:00 AM and 8:45 AM and between 2:30 PM and 5:15 PM



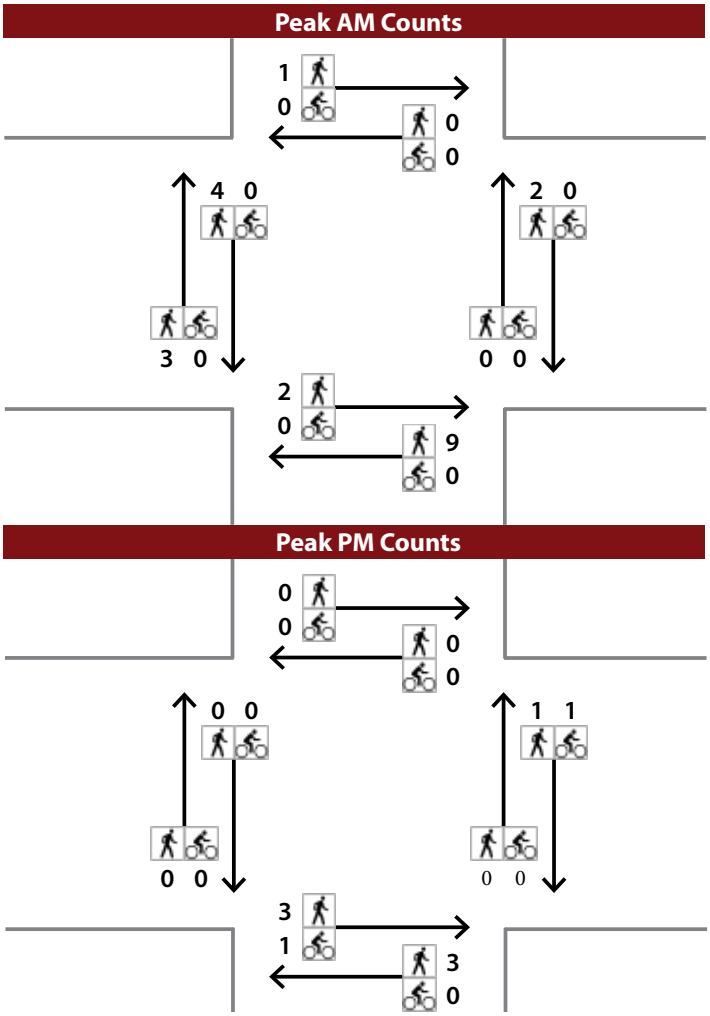
Nason Street and Cactus Avenue

Counts conducted 16 October 2013 at 15 minute intervals between 6:00 AM and 8:45 AM and between 2:30 PM and 5:15 PM



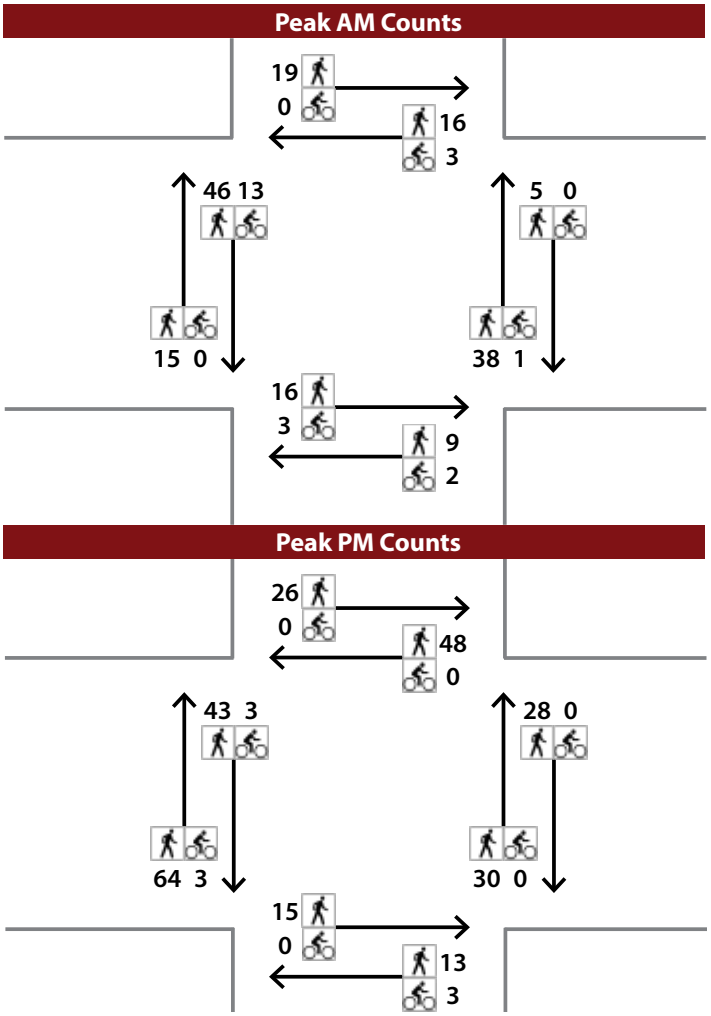
Moreno Beach Drive and Eucalyptus Avenue

Counts conducted 16 October 2013 at 15 minute intervals between 6:00 AM and 8:45 AM and between 2:30 PM and 5:15 PM



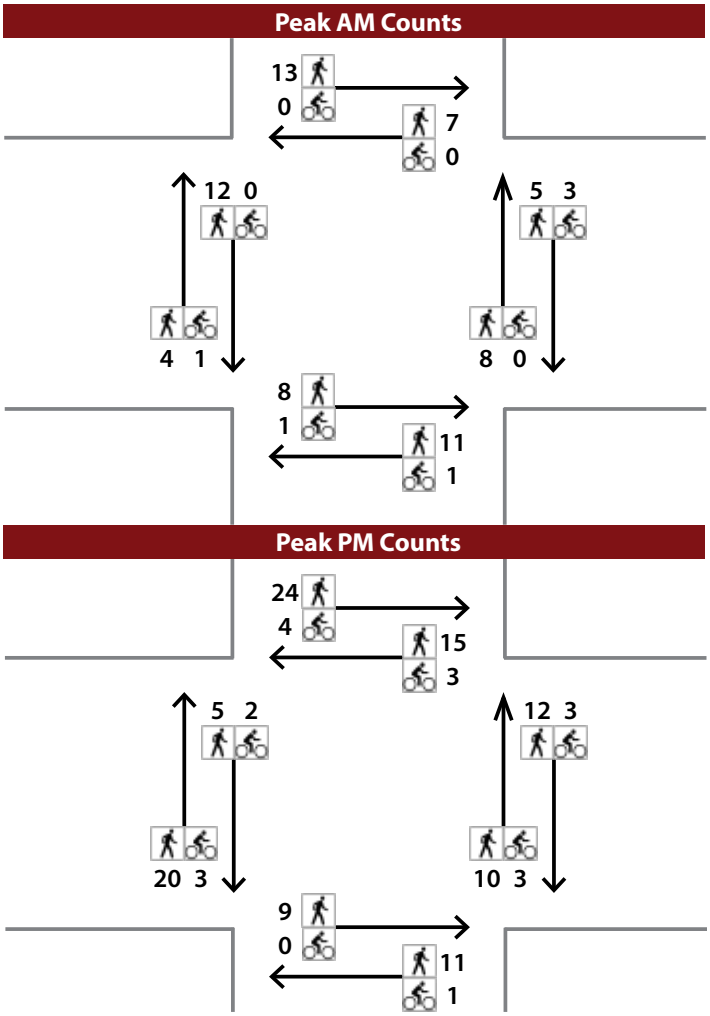
Lasselle Street and Iris Avenue

Counts conducted 16 October 2013 at 15 minute intervals between 6:00 AM and 8:45 AM and between 2:30 PM and 5:15 PM



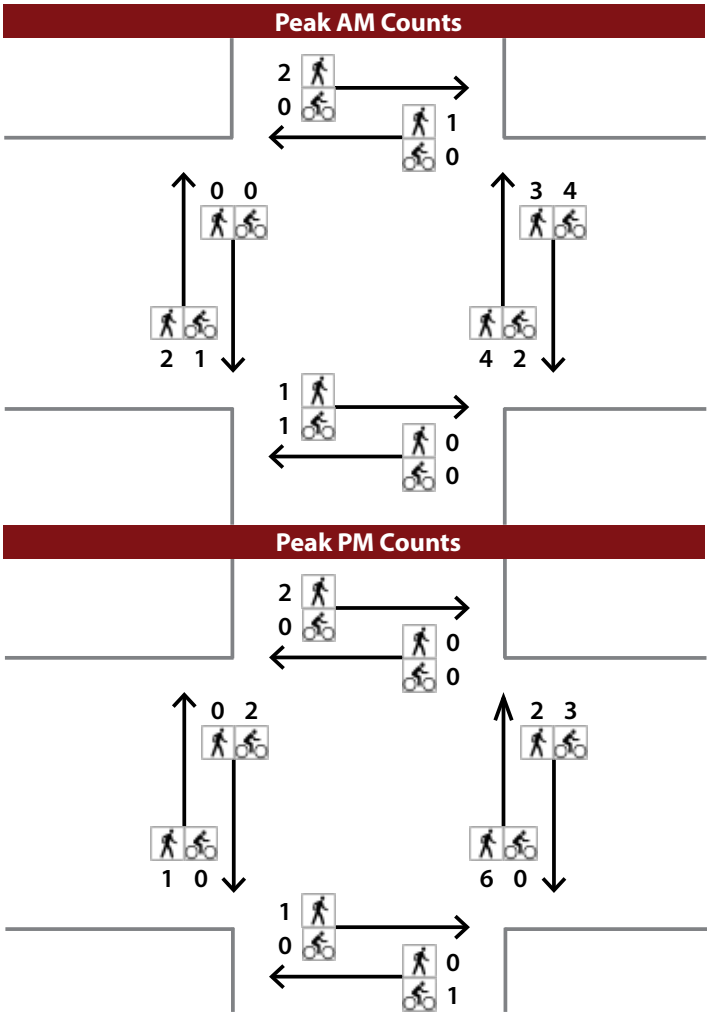
Indian Street and Alessandro Boulevard

Counts conducted 16 October 2013 at 15 minute intervals between 6:00 AM and 8:45 AM and between 2:30 PM and 5:15 PM



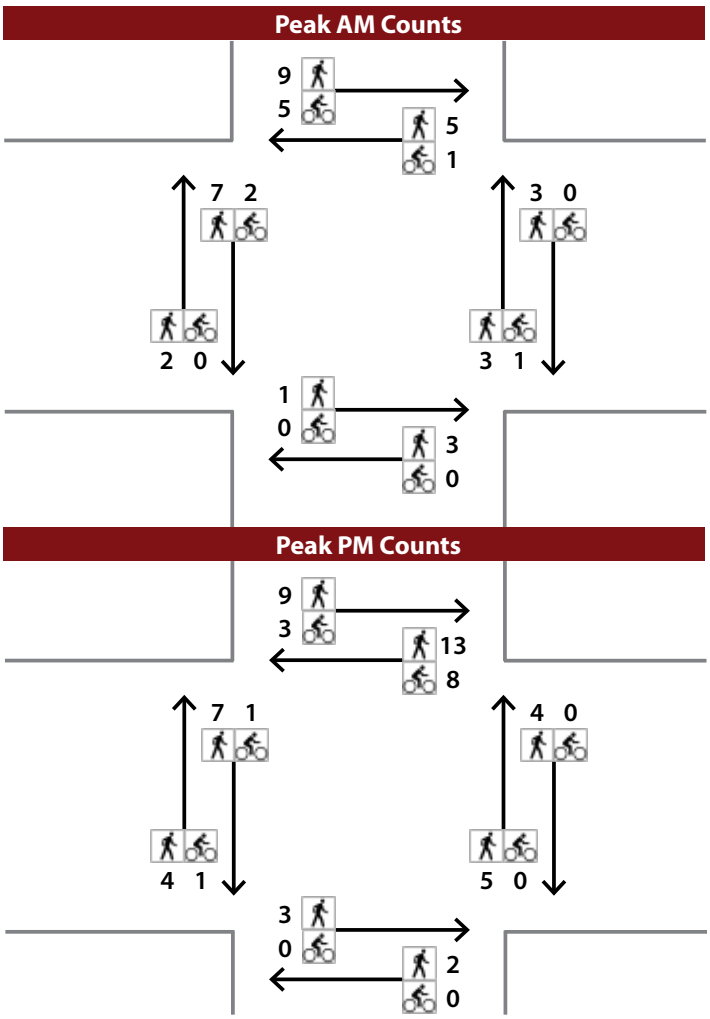
Heacock Street and Cactus Avenue

Counts conducted 16 October 2013 at 15 minute intervals between 6:00 AM and 8:45 AM and between 2:30 PM and 5:15 PM



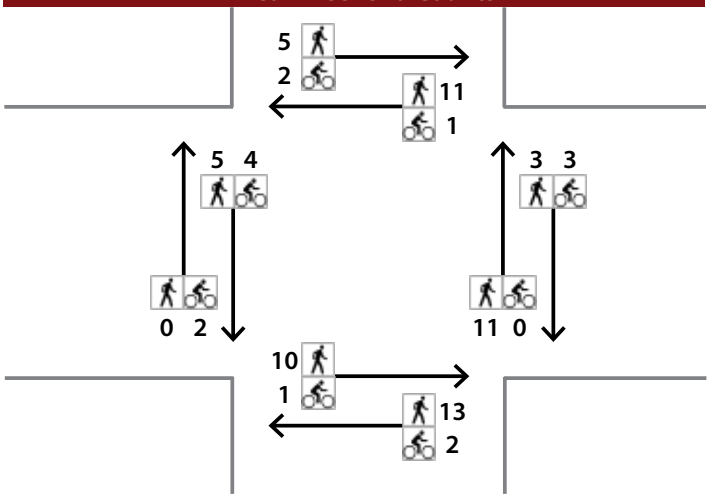
Frederick Street and Alessandro Boulevard

Counts conducted 16 October 2013 at 15 minute intervals between 6:00 AM and 8:45 AM and between 2:30 PM and 5:15 PM



Graham Street and Cottonwood Boulevard

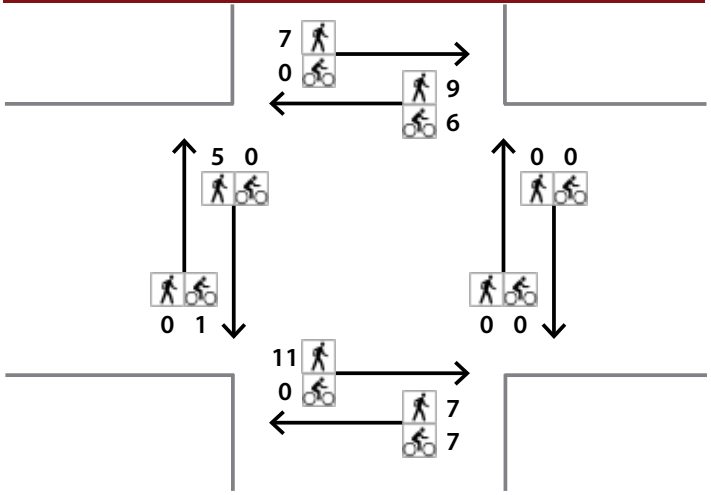
Peak Weekend Counts



Counts conducted 12 October 12th 2013 at 15 minute intervals between 9:00 AM and 2:45 PM

Via Del Lago and Iris Avenue

Peak Weekend Counts



Counts conducted 12 October 12th 2013 at 15 minute intervals between 9:00 AM and 2:45 PM

California Streets and Highways Code Section 891.2, items a-k

For reviewer convenience, code text and associated document sections and/or responses are listed below:

(a) The estimated number of existing bicycle commuters in the plan area and the estimated increase in the number of bicycle commuters resulting from implementation of the plan.

Current estimate of bicycle commuters is 2,270 using industry standard calculation methods. Expected increase as a result of this plan was based on other jurisdictions' experience with bikeway system development. This also addresses forecasted future employment increase of seven percent to 62,771, yielding 4,394 commuting cyclists, or 2,124 additonal cyclists, a 93 percent increase resulting from implementation of this plan. This includes students and transit users.

This document recommends establishing a cycling activity baseline using annual count locations shown in Appendix D, where initial counts were conducted for this study.

(b) A map and description of existing and proposed land use and settlement patterns which shall include, but not be limited to, locations of residential neighborhoods, schools, shopping centers, public buildings and major employment centers.

See Chapter 2 maps and tables.

(c) A map and description of existing and proposed bikeways.

See Chapter 3 maps and tables.

(d) A map and description of existing and proposed end-of-trip bicycle parking facilities. These shall include, but not be limited to, parking at schools, shopping centers, public buildings and major employment centers.

See Chapter 3 maps and tables.

(e) A map and description of existing and proposed bicycle transport and parking facilities for connections with and use of other transportation modes. These shall include, but not be limited to, parking facilities at transit stops, rail and transit terminals, ferry docks and landings, park and ride lots, and provisions for transporting cyclists and bicycles on transit or rail vehicles of ferry vessels.

See Chapter 2 maps and tables.

(f) A map and description of existing and proposed facilities for changing and storing clothes and equipment. These shall include, but not be limited to, locker, restroom and shower facilities near bicycle parking facilities.

See Chapter 3 maps and tables, particularly Section 3.2.

(g) A description of bicycle safety and education programs conducted in the area included in the plan, efforts by the law enforcement agency having primary traffic law enforcement responsibility in the area to enforce provisions of the Vehicle Code pertaining to bicycle operation, and the resulting effect on accidents involving cyclists.

In the last five years, the Moreno Valley Police Department has given out approximately 1,500 bicycle helmets, facilitated seven bicycle rodeos and conducted approximately 300 bicycle safety presentations for area schools and youth organizations such as Boy/Girl Scouts, PTA, etc.

They have also increased bicycle enforcement thought their normal work and via directed enforcement deployments.

(h) A description of the extent of citizen and community involvement in development of the plan including, but not be limited to, letters of support.

See Section 1.4: Methodology, and Appendix C, Community Input Summary.

(i) A description of how the bicycle transportation plan has been coordinated and is consistent with the local or regional transportation, air quality or energy conservation plans, including, but not be limited to, programs that provide incentives for bicycle commuting.

Encouraging bicycle commuting is addressed throughout the document, particularly Section 3.7: Recommended Bicycle Programs.

(j) A description of the projects proposed in the plan and a listing of their priorities of implementation.

See Chapter 3 maps, tables and program recommendations.

(k) A description of past expenditures for bicycle facilities and future financial needs for projects that improve safety and convenience for bicycle commuters in the plan area.

The City of Moreno Valley has completed 23 bicycle lane projects in the last five years for a total of $719,644. Many were reallocations of existing roadways with standard five foot bicycle lanes measured from the curb face that were changed to six foot bicycle lanes measured from the edge of the gutter pan.