BICYCLE MASTER PLAN

City of Huntington Beach, California

2013

Acknowledgements

This Bicycle Master Plan was prepared for the City of Huntington Beach with the assistance of the Bicycle Advisory Committee (BAC). Members directly involved in plan development were:

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Executive Summary

Background

Developing this bicycle master plan was a goal shared by the City of Huntington Beach, its Bicycle Advisory Committee and the Huntington Beach Bicycle Advocates (HuBBA). Adoption of such a plan was a way to improve on the City's League of American Bicyclists' (LAB) Bicycle Friendly Community Bronze level designation the City had already achieved based on its 2010 application. At that time, the LAB indicated that the City was likely to achieve Silver level status with Council adoption of a bicycle master plan. In support of this upgrade, this Bicycle Master Plan is item 2 of HuBBA's proposed *Bicycle Friendly Plan*. The other items had already been initiated or accomplished, or are ongoing:

HuBBA Bicycle Friendly Plan

1. *Publicize the city's pride in being bicycle friendly and make a public commitment to become an even more bicycle friendly city.*
2. *Create an approved Bicycle Master Plan for the city.*
3. *Conduct bicycle traffic skills classes for teens and adults in the city's Community Services Department.*
4. *Promote bicycle safety classes in our schools.*
5. *Encourage safe routes to school programs throughout the city.*
6. *Implement a publicity program to educate the public about sharing the road.*
7. *Recognize and publicize a city-wide Bike to Work Day and Bike Month with a series of bicycle oriented events.*
8. *Supplement the police training curriculum to add more emphasis on the vehicle code as it applies to cyclists and the concept of vehicular cycling.*
9. *Survey all bicycle lanes to verify that they are up to current CA MUTCD standards.*
10. *Improve our heavily used beach multi-use paths to reduce the hazardous conflicts that occur between pedestrians and cyclists.*
11. *Designate one qualified city employee as a Bicycle Program Coordinator.*
12. *Form a Bicycle Advisory Board within the city government to include representatives from all city departments involved in bicycle related actions, as well as citizen representatives of the cycling community.*
13. *Aggressively seek outside funds including grants to help support our bicycle friendly actions.*

Approach and Goals

This Bicycle Master Plan's overall objective is an integrated system of infrastructure, programs and policies that makes cycling attractive for those that do not now regularly ride in Huntington Beach, and supports those who already opt to ride their bicycles instead of driving their motor vehicles.

Cyclists' unique characteristics, needs and priorities must be taken into account when making facility, policy or program recommendations. It is therefore imperative that a "cycling perspective" guide bicycle planning. This study 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.

Cycling should be considered a fundamental component of overall transportation planning, which addresses on- and off-streets bicycle facilities, as well as modal integration at transit centers and parking facilities. Balancing resources require consideration of all modes, including cycling.

Planning for bicycles 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 other user needs where shared use is appropriate. This will generally require using both the existing transportation infrastructure and the construction of special facilities for cyclists.

The coexistence of cyclists and vehicle drivers on roads requires that all are sensitive to and recognize a common set of rules. Training, education and enforcement are as important as physical planning and design and are addressed as such in this plan.

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 supports the other points noted previously by recommending facilities, programs and policies designed to make the City of Huntington Beach a more bicycle-friendly place and encouraging more residents to ride rather than drive. Its emphasis on programs and policies reflects the fact that the City already has a network of bicycle lanes in place, and is likely to achieve increased bicycle usage through both improved facilities and program and policy initiatives. By providing a comprehensive range of bicycle friendly infrastructure, programs and policies, Huntington Beach can become a true "cycling community."

Significant Findings

Compared to other coastal southern California cities, Huntington Beach is relatively flat, which makes regular cycling feasible for most riders. Along with level terrain, its grid street system, beachfront paths and excellent weather support year round cycling.

However, compared to other cities on a per capita basis, the City has had a relatively high number of collisions involving cyclists during the past five years for which data were reviewed, though most occurred in the downtown beach area and did not result in serious injury. It is likely that this area's commonly high level of congestion plays a role because lower speeds significantly reduce injury severity.

While most of Huntington Beach'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 users to go out of their way via the arterials.

Connections with surrounding communities and the overall region are needed to make cycling a viable commuter mode. This will require close coordination with Caltrans, the Southern California Association of Governments (SCAG), the Orange County Transportation Authority (OCTA) and adjacent cities to ensure that planned improvements are implemented in a timely manner and that they connect with the City in a way that will make potential bicycle commuters seriously consider riding instead of driving.

Where residents and visitors choose to go and how they move about the City 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 commuting by bicycle increases.

Bicycles can play a significant intra-city travel role since Huntington Beach is large enough to make cycling convenient, but small enough to put all destinations within a reasonable cycling range. 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. Making the connections between modes as seamless as possible will do much to encourage residents and visitors to arrive via some other mode than driving their own vehicle.

Applicable Legislation

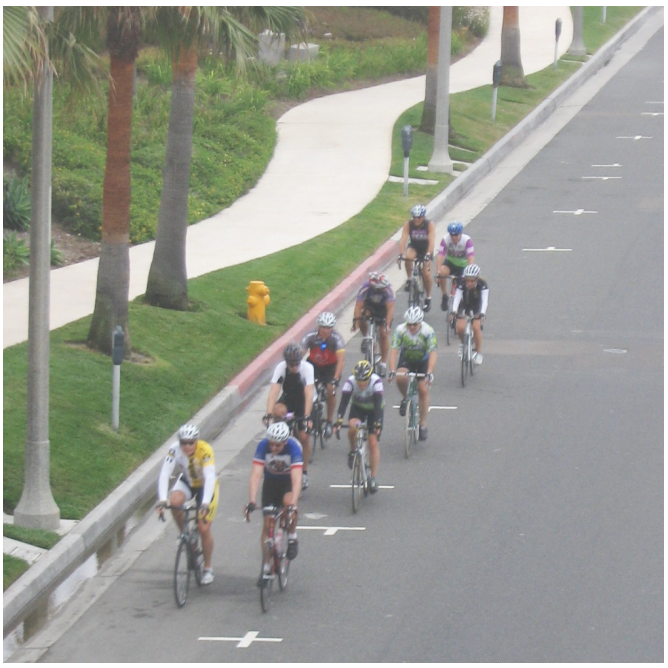
It will be difficult for the State of California to reach its transportation-related GHG reduction targets without increasing cycling. The impact of several recent legislative acts may therefore be enhanced by the implementation of effective bikeway master plans.

AB 1358 The Complete Streets Act

AB 1358 requires a city or county's legislative body, when revising their general plan's circulation element, to identify how the jurisdiction will provide routine accommodation of all roadway users, including vehicle drivers, pedestrians, cyclists, individuals with disabilities, seniors, and users of public transportation. The bill also directs the Office of Planning and Research 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 32 Global Warming Solutions Act

AB 32 calls for the reduction of greenhouse gas emissions and sets the 2020 emissions reduction goal into law. 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 1581 Bicycle and Motorcycle Traffic Signal Actuation

This bill defines a traffic-actuated signal as one 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 the 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.

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 vehicles 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 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.

Increased cycling obviously benefits all residents by reducing fossil fuel emissions and traffic congestion. Employing travel, emissions and population data for Orange County and then extrapolating from them Huntington Beach's proportion of the county's overall population, each one percent replacement of light-duty vehicle* trips** with bicycle trips (tons/day) yields the following reductions:

- Vehicle Miles Traveled (VMT): 41,176 miles/year
- Smog-Forming Gases: 110 pounds/day
- Inhalable Particles***: 22 pounds/day
- Carbon Monoxide: 620 pounds/day

**Vehicles such as passenger cars and light trucks (GVWR < 5,751 lbs.)*
***Average trip length of 1.8 Miles*
****Includes tire and brake wear*

Source: California Environmental Protection Agency – Air Resources Board

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 climate areas like Huntington Beach'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 bike. 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 $2,000 annually. Based on an example wage of ten dollars an hour, a vehicle owner must work 200 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. Cycling qualifies and an average adult can bicycle 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, 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.

Proposed Facilities and Programs

The City has a network of bicycle lanes and some off-street paths, as well as cycling support programs, most notably an innovative cyclist diversion program. This Bicycle Master Plan recommends additional facilities to improve overall connectivity, as well as programs and policies to further encourage bicycle usage as regular transportation. Many of these programs are included in HuBBA's proposed plan noted previously, which represents an excellent blueprint for making Huntington Beach even more bicycle-friendly.

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 California Department of Transportation (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, sections relating to code compliance are compiled in the final appendix.

Introduction 1

The City of Huntington Beach wants to promote a safe, convenient and efficient environment for bicycle travel to and across the City. This Bicycle Master Plan will provide for improved safety through education and training programs and identifies prioritized bicycle infrastructure projects. A goal is to integrate this bicycle master plan with Orange County's *Commuter Bikeways Strategic Plan* (CBSP) wherever feasible to enhance access, improve safety and increase the number of bicycle commuters.

The study vision is a city 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 Huntington Beach'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 many 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.

1.1 Plan 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 looks at 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.

With the implementation of the recommendations of this study, 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 Huntington Beach destinations. Precise alignments and details will be developed during subsequent implementation phases. This study sets the foundation for decisions and identifies a blueprint for future bicycle development so that opportunities are not lost through other infrastructure, land use and facility development decisions.

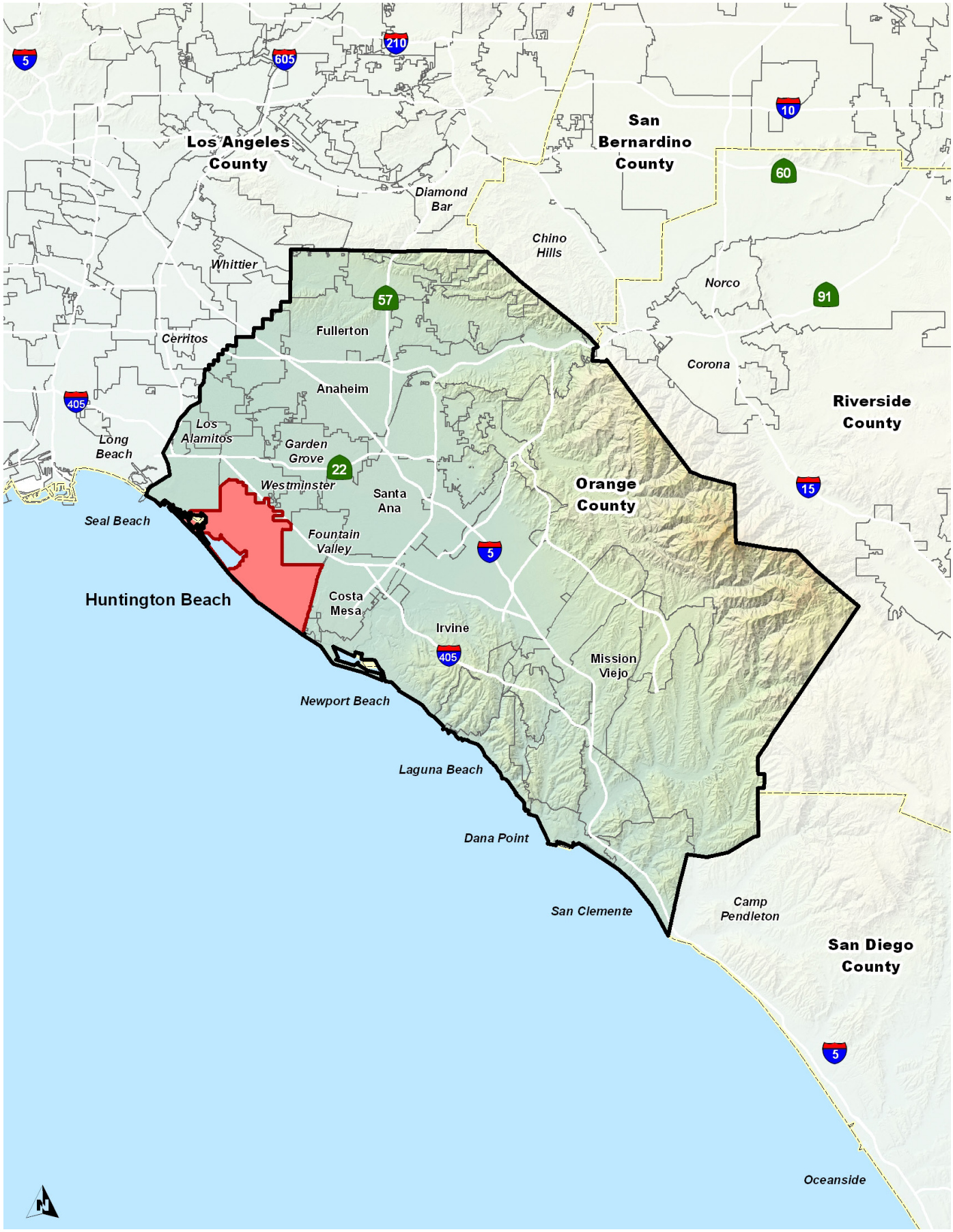
1.2 Plan Study Area

The study area was all of the City of Huntington Beach, as well as where bicycle connections were possible with surrounding communities. This was to ensure that the City's bikeways would be part of a viable regional system supporting non-motorized transportation modes, and was also a requirement for state approval of the City's plan. A connected system allows residents and visitors the option to ride to and around the City without needing to drive. This study therefore addresses on-street bicycle facilities and multi-use pathways both within and connecting with the City (See Figure 1: Regional Setting).

Bicycle parking under the pier

Huntington Beach Multi-use Beach Path

Figure 1: Regional Setting



1.3 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).

Class 1: Multi-use Pathways

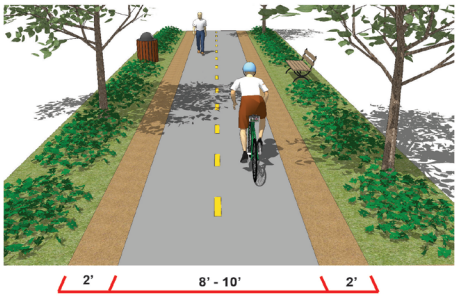
While Class 1 multi-use pathways are often referred to as "bicycle paths," all non-motorized users may use them. They are physically separated from motor vehicle routes as exclusive rights-of-way for all nonmotorized users with motor vehicle cross flows kept to a minimum. Where there is the potential 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 between the Class 1 path and adjacent roadway's pavement edge requires a physical barrier.

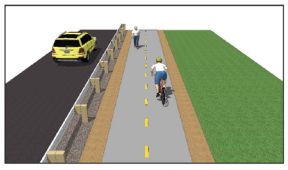
Huntington Beach Multi-use Beach Path

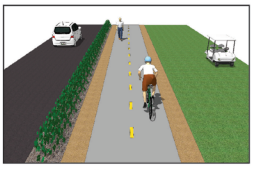
Unlike on-street facilities that already have defined minimum design speeds, this is a factor to consider for Class 1 facilities. On relatively flat routes, the minimum design speed is 25 mph.

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. California Department of Transportation (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.

Class 1 - Multi-Use Pathways







The edge of a bike path that is less than five feet from a road must have a physical barrier such as rails, dense shrubs or trees. (Caltrans Chapter 1000)

Provides a completely separated right-of-way for the exclusive use of bicycles, pedestrians and other non-motorized users with crossflow by motorists minimized.

Description: Right-of-way separated from motor vehicle traffic. Used where adjacent roadway speeds and the volume of traffic is too high for safe shared use. Also used for connections through open space areas and parks, or where no other facility type is feasible.

Design Guidelines:

- Eight foot paved with two foot graded edge minimum width for two-way use. Greater width is recommended for high use corridors.
- Paths adjacent to a highway closer than five feet from the edge of the shoulder shall include a physical barrier (guard rail).
- On facilities with expected heavy use, a yellow centerline stripe is recommended to separate travel in opposite directions.

References:
Caltrans Highway Design Manual Chapter 1000
California MUTCD 2012

Class 2: Bicycle Lanes

Class 2 facilities are marked lanes within roadways adjacent to the curb or parking lane, delineated by appropriate striping and signage for preferential use by cyclists.

Bicycle lanes must be one-way facilities and carry traffic in the same direction as adjacent motor vehicle traffic. In unique situations, it may be appropriate to provide a contra-flow bicycle lane on the left side of a one-way street where it will decrease the number of conflicts, such as heavy bus traffic. Where this occurs, the lane should be marked with a solid, double yellow line and width increased by one foot.

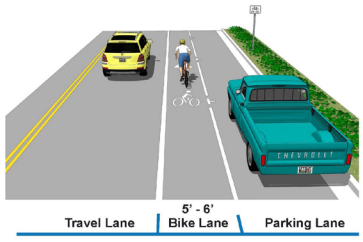
Bicycle lane on Warner Avenue

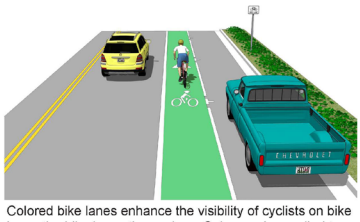
Under ideal conditions, the minimum bicycle lane width is four feet, but certain edge conditions can dictate additional width. However, even where the roadway width is available, Class 2 bicycle lanes should be no wider than six feet to prevent the appearance of a travel lane that could encourage vehicle drivers to drive or park within them. Additional width can be striped as a buffer on the travel lane side. Localized roadway conditions such as depressions fronting curb drains may require additional Class 2 lane width to allow cyclists to safely avoid them.

Bicycle lanes are generally placed between the parking lane or curb and the motor vehicle lanes. If parking volume is substantial or turnover is high, an additional one or two feet of width, as a striped buffer, is desirable.

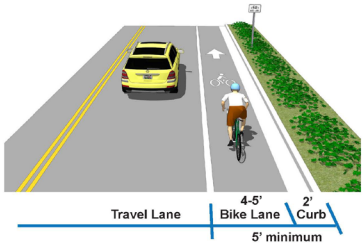
Finally, in actual practice, the placement and width of Class 2 bicycle lanes has been undergoing substantial change as many planners and advocates have come to agree that the current minimums may be inadequate for some situations. For example, a number of municipalities now provide greater width adjacent to parallel vehicle parking, and apply the extra width as buffer space between the vehicles and the bicycle lane to avoid "dooring," or the inadvertent opening of vehicle doors into the cyclist's path, which can be very dangerous. (See Section 3.2: Door Zone Analysis, for more information.)

Class 2 - Bike Lane





Colored bike lanes enhance the visibility of cyclists on bike lanes the bike lanes themselves. Color can be applied to the entire bike lane or at high-risk locations where motorists are permitted to merge into or cross bike lanes. This application is not yet approved by the CA MUTCD.



Bike Lane Marking

Sign R81 (CA)

Provides a striped lane for one-way bike travel on a street or highway.

Description: Provides a striped lane for one-way bike 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, bike lanes are located between the parking area and the traffic lanes.

Design Guidelines:

- Five foot minimum width for bike lanes located between the parking area and the traffic lanes.
- Four foot minimum width if no gutter or parking exists. Including a normal 2-foot gutter, the minimum bike lane width shall be 5 feet.

References:
Caltrans Highway Design Manual Chapter 1000 and Chapter 300
California MUTCD 2012

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 only 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. How appropriate a particular roadway is for a bicycle route includes directness and connectivity with other bicycle facilities. Directness is important for commuting cyclists, but may not be important for recreational riders, for whom scenery or fitness may be the primary factor in selecting a route.

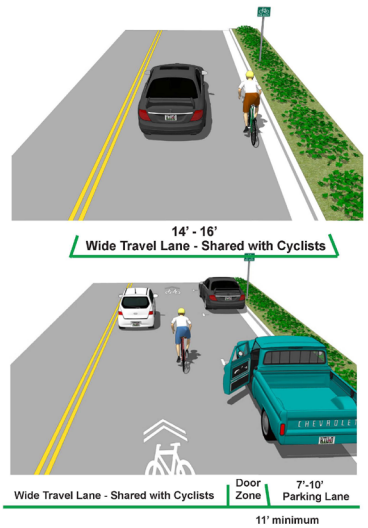
While the chosen roadways may not be free of problems, they should offer the best balance of safety and convenience of the available alternatives. In general, the most important considerations are pavement width and geometrics, traffic conditions and appropriateness of the intended purpose.

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 marking method where posted speed limits are 35 mph or less to alert vehicle drivers to the expected presence of cyclists, as well as to direct cyclists to the proper distance to ride from the curb to avoid suddenly opened car doors. Shared lane markings should be paired with a "Bikes may use full lane" sign (R4-11).

Shared Lane Marking ("Sharrow" or "SLM")

Class 3 - Bike Route



Shared Lane Marking or "Sharrow"

Sign D11-1

Sign R4-11

Provides for shared use of the roadway with motor vehicle traffic.

Description: Within vehicular right-of-way, delineated by directional signage. Used where roadway speeds and traffic volume are fairly low and shoulder provides adequate room. Bike Routes indicate to bicyclists that there are particular advantages to using these routes as compared with alternative routes. A shared lane marking or 'Sharrow' may be added to guide the cyclist in correct lane placement in higher traffic or parking turnover conditions and to warn motorists of bicycle presence.

Design Guidelines:

- Wider than standard outside lane recommended.
- Because bicyclists are permitted on all roadways (except prohibited freeways), bicycle routes should offer a higher degree of service than other streets.
- Center of Sharrow marking should be at minimum of 11' from curb face.
- Sharrows should not be placed on roadways that are over 35mph.

References:
Caltrans Highway Deisgn Manual Chapter 1000, California MUTCD 2012

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 with 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.

Buffered bicycle lane - Seapoint Drive

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 a proposed change to the CA MUTCD is, 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 vehicle drivers to watch for and to yield to cyclists when they encounter them within the painted area. The FHWA found that both vehicle drivers and cyclists have a favorable impression of green colored bicycle lanes. Cyclists felt safer while riding on green bicycle lanes, while vehicle 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 have to 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 (Simulation) - San Diego, CA

Bicycles May Use Full Lane Sign (R4-11)

Another important change is a new sign for use along streets designated as Class 3 routes that advise all users that cyclists are allowed the full use of travel lanes. These read "Bicycles May Use Full Lane" (BMUFL) and are generally placed in conjunction with Shared Lane Markings ("Sharrows" or SLMs). These signs will generally replace the yellow and black bicycle symbol diamond and associated "Share the Road" placard, which were warning signs only. The new BMUFL signs are white and black, the colors used for full regulatory signage. These signs, along with SLMs, allow cyclists to legally 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.

Cycle Track

A cycle track is a combination between a bicycle lane and multi-use path. It can be either one- or two-way depending on roadway configuration, intersections and adjacent land use. It is generally a separate facility when adjacent to a pedestrian sidewalk, as well as physically protected from adjacent vehicle travel 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.

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 - Montreal, Quebec

Bicycle Boulevard

Bicycle boulevards are relatively low speed streets designed to 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 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. Intersections typically 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.

Most bicycle boulevards do not have bicycle lane striping, 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.

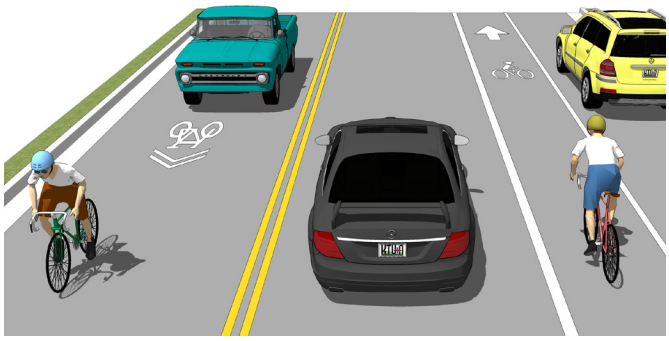
Because their traffic calming features improve pedestrian safety, as well as encourage cycling, some cities de-emphasize the bicycle specificity of these routes by designating them as "calmed, green or quiet" streets, or "neighborhood byways or parkways."

Bicycle boulevard - San Luis Obispo, CA (Source: www.pedbikeimages.org)

Hybrid Facilities (Context-sensitive Solutions)

Hybrid facilities blend components of established facility types to take advantage of some benefit inherent to those components that better addresses a specific location's issues. For example, where there is insufficient roadway width for Class 2 lanes both ways, it may be advisable to install a Class 3 bicycle route on one side of a roadway and a Class 2 on the other.

There are opportunities for hybrid facilities that can improve cycling conditions in Huntington Beach, but like most other municipalities, both sides of roadways have traditionally been treated the same. There are exceptions, including a few segments of bicycle facilities that are hybrids of two different classes. These can be found where the roadway is too narrow to accommodate bicycle lanes on both sides of the street. A bicycle lane is used on one side and a bicycle route is signed in the opposite direction.



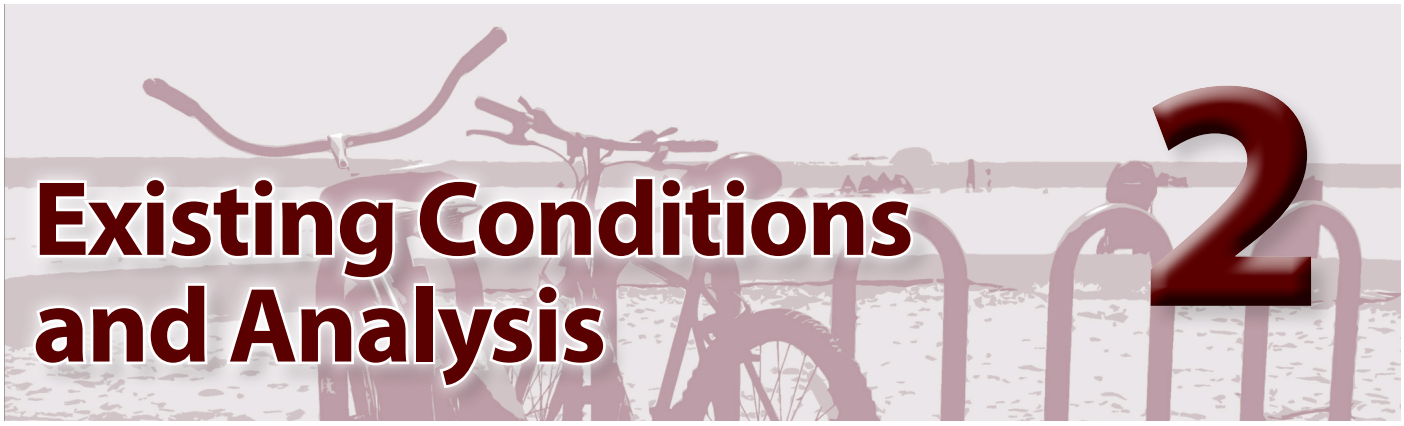
Hybrid facility - Class 3 with "Sharrows"/Class 2 lane

Paved Multi-use Paths and Wide Walkways

These paved multi-use paths and wide walkways are not officially Class 1 facilities. They occur primarily within easements through developed parks. Examples of these paths can be found within the Union Pacific Ralroad Corridor and power line easements, although there are many more throughout the City. These can vary in width, but are generally asphalt or concrete, eight feet wide.

Those that have been identified can be critical connections for current and future bicycle facilities.

Paved multi-use path along Edinger Avenue connecting Marina Park and Marina High School



Existing Conditions and Analysis 2

2.1 Existing Plans

The following plan excerpts list relevant goals, objectives, policies and program related to bicycles.

General Plan Circulation Element

Goals, Policies and Objectives

These goals and policies establish the framework City staff and decision makers will use to enhance and improve all modes of circulation in Huntington Beach. Where possible, quantified objectives are also stated. References to applicable implementation programs are provided following the policy statement.

Regional Mobility

Goal

CE 1 Provide a balanced transportation system that moves people and goods throughout the City efficiently, promotes economic development, preserves residential neighborhoods, and meets safety standards, and minimizes environmental impacts.

Policies

CE 1.1 Pursue completion of missing roadway links and other related facilities shown on the Arterial Highway Plan. Related Implementation: CE-11, 12

CE 1.2 Monitor and participate in applicable County, regional, State, and federal transportation plans and proposals. Related Implementation: CE-25, 26, 27, 28, 31, 32, 33

CE 1.3 Maintain compliance with the County's Congestion Management Plan (CMP) as shown on Figure CE-3. (ICE 2 and I-CE 4) OCTA Congestion Management Program or any subsequent replacement program. Related Implementation: CE-13, 27, 28

CE 1.4 Coordinate planning, construction, and maintenance of circulation improvements with adjacent jurisdictions and transportation agencies to ensure consistency within the circulation system. Related Implementation: CE-6, 25, 26, 28, 29, 31

CE 1.5 Provide adequate capacity for circulation needs while minimizing significant negative environmental impacts. Related Implementation: CE-1, 11, 12, 13, 17, 21, 25, 28

CE 1.6 Develop and maintain the City street network consistent with the Arterial Highway Plan (Figure CE-2) and standard roadway cross-sections (Figure CE-1), including appropriate roadway widths, medians, and bicycle lanes. Related Implementation: CE-1, 6, 11, 12

Roadway Circulation

Goal

CE 2 Provide a circulation system that supports existing, approved, and planned land uses throughout the City while maintaining a desired level of service and capacity on all streets and at all intersections.

Policies

CE 2.7 Require that driveways be located to minimize impacts to the smooth, efficient and controlled flow of vehicles, bicycles and pedestrians. Related Implementation: CE-17, 18

Public Transportation

Goal

CE 4 Create a balanced and integrated multi-modal transportation system that increases mass-transit opportunities for Huntington Beach residents.

Policies

CE 4.1 Encourage and support the various public transit agencies and companies, ride-sharing programs, and other incentive programs that provide forms of transportation other than the private automobile. Related Implementation: CE-7, 14, 15, 35

CE 4.2 Continue to reserve abandoned rail rights-of-way for future transportation uses such as transit and or bicycle facilities. Related Implementation: CE-33

CE 4.3 Explore the possibility of locating a transportation center located in the vicinity of the in or near Downtown commercial area. Related Implementation: CE-14

CE 4.4 Pursue an urban rail transit system that serves Huntington Beach. Related Implementation: CE-14, 28

Transportation Demand Management (TDM) and Air Quality

Goal

CE 5 Maximize use of transportation demand management strategies to reduce total vehicle miles traveled and improve regional air quality.

Policies

CE 5.1 Require developers to incorporate design features that reduce air pollution from motor vehicles, such as transit facilities and park-and-ride sites; bus benches, shelters, pads, or turnouts; bicycle racks and lockers; and preferred parking for ride sharers. Related Implementation: CE-19, 21

CE 5.2 Encourage and support the use of low emission and alternative fuel vehicles within the City. Related Implementation: CE-35

CE 5.3 Require businesses to provide employee incentives for using alternatives to the conventional automobile, including carpools, vanpools, buses, bicycles, and walking, and telecommuting. Related Implementation: CE-7, 21, 35

CE 5.4 Support the efforts of businesses to use transportation management techniques such as flex-time, staggered working hours and other means to lessen commuter traffic during peak hours. Related Implementation: CE-7, 35

Parking

Goal

CE 6 Ensure that the parking demands of non-residential uses do not adversely impact the City's residential neighborhoods, that the City's parking policies support reduced reliance on personal auto use and that parking supply is adequate to meet City economic development objectives.

CE 6.4 Explore the possibility of increasing bicycle parking in or near downtown. Related Implementation: CE-6

Pedestrian, Bicycle, and Equestrian Paths and Waterways

Goal

CE 7 Provide a system of bicycle, pedestrian, and equestrian paths, and waterways for commuter, school and recreational use.

Policies

CE 7.1 Coordinate the planning of equestrian, bicycle, bus and pedestrian routes and facilities to promote an interconnected system. Related Implementation: CE-6, 19, 32

CE 7.2 Coordinate with neighboring jurisdictions to ensure that bicycle routes within the City connect to and are consistent with routes in adjacent jurisdictions. Related Implementation: CE-6, 28

CE 7.3 Coordinate with the County to ensure that new routes identified in the City's Bike Route Plan are incorporated within the County's Master Plan of Bikeways. Related Implementation: CE-28

CE 7.4 Encourage the use of easements and/or rights-of-way along flood control channels, public utilities, railroads, and streets for use by cyclists and/or pedestrians, where safe and appropriate. Related Implementation: CE-19

CE 7.5 Maintain existing pedestrian and bicycle facilities, and require developers to provide pedestrian walkways and/or bicycle pathways between developments, new residences and schools, parks, and public facilities. Related Implementation: CE-15, 17, 19

CE 7.8 Implement and operate appropriate traffic control devices throughout the community to reduce conflicts between pedestrians, bicycles, and motor vehicles. Related Implementation: CE-2, 15

CE 7.10 Ensure that bicycle and pedestrian facilities within the City comply with accessibility provisions of the Americans with Disabilities Act (ADA). Related Implementation: CE-6, 15

Implementation Programs

CE-2: Accident Monitoring

Monitor recurring accident locations (including vehicle versus vehicle, bicycle and make/or pedestrian accidents), and determine necessary recommendations and modifications to the appropriate facilities. This may include the use of advance technologies where appropriate.

CE-5: Neighborhood Circulation Improvements

Prepare and maintain a Neighborhood Traffic Management Technical Administrative Report that identifies needed methods to address cut-through traffic volumes, high speeds, truck traffic intrusions, demonstrated accident history, parking shortages, or school-related traffic congestion in City neighborhoods such as:

- *Considering appropriate traffic-calming measures such as raised medians and provision of bicycle or transit lanes to mitigate problems posed by schools and other land uses that generate high traffic volumes at specific times. Provide solutions to mitigate these problems as warranted by local studies.*

Department: Public Works, City Council
Working with: School Districts
Related policies: 3.1, 6.1

CE-6: Bikeway Plan

Implement and update Huntington Beach's Bikeway Plan to plan and prioritize facilities for both recreational cyclists and commuters, including:

- *Reviewing neighboring jurisdictions' bikeway plans every five years to ensure consistency*
- *Linking bicycle routes with bus routes to promote an interconnected system.*
- *Evaluating potential for a future bicycle parking structure in or near downtown.*
- *Ensuring compliance with ADA accessibility standards.*

Department: Public Works, Planning Commission, City Council
Working with: OCTA, Caltrans
Related Policies: CE 1.4, 1.6, 6.4, 7.1, 7.2

CE-7: Transportation Demand Management Ordinance

Create and implement programs that will aid in improving air quality by reducing motor vehicle trips, such as those programs recommended by the SCAQMD, required by the Transportation Demand Ordinance (Zoning Code Title 23, Chapter 230, Section 230.36), or funded by the Mobile Source Air Pollution Reduction Ordinance vehicle fee allocation. The TDM ordinance requires employers of 100 or more persons to support alternative forms of transportation by providing appropriate facilities, including: showers and lockers, parking for vanpools, bicycle parking and passenger loading areas.

Department: Planning, Public Works, Planning Commission, City Council
Related Policies: CE 4.1, 5.3, 5.4

CE-11: Capital Improvement Program

Use the City's 5-year Capital Improvement Program (CIP) process to prioritize, fund, and build required roadway and bikeway improvements, and to address phasing and construction of traffic infrastructure throughout the City.

To prioritize these improvements, the City's Technical Administrative Reports (TARs) will be reviewed and updated regularly with current citywide traffic counts for roadway links and intersections. Roadways and intersections approaching the LOS standards stated in Objective 2.1 should be prioritized appropriately for improvements including road widening, paving, parking restrictions, or intersection improvements.

Department: Public Works, City Council
Related Policies: CE 1.1, 1.5, 1.6, 2.1, 2.2, 2.3

CE-19: Alternative Transportation Mode Design Features

Require new development to incorporate transit-oriented design features and attractive, accessible, and appropriate transit, bicycle, equestrian, and pedestrian amenities to promote and support public transit and alternate modes of transportation, including but not limited to:

- *Requiring that all new bicycle trip destinations, including schools, shopping areas, and transit stops be equipped with bicycle racks and/or bicycle lockers.*
- *Encouraging developments to incorporate easements and/or rights of way along flood control channels, public utilities, railroads and streets for the use of cyclists and/or pedestrians.*

Department: Public Works, Planning Commission, City Council
Working with: OCTA
Related Policies: CE 5.1, 7.1, 7.4, 7.5, 7.6

CE-28: Orange County Transportation Authority

Work with the Orange County Transportation Authority (OCTA) to achieve the following:

- *Review, every five years, the Orange County Master Plan of Bikeways to assure consistency. Update Huntington Beach's Bike Plan, as appropriate. (Note: Bikeway master plans are required to be updated every five years.)*

Department: Public Works, City Council
Working with: OCTA
Related Policies: CE 1.2, 1.3, 1.4, 1.5, 4.4, 7.2, 7.3

Beach and Edinger Corridors Specific Plan

The Beach and Edinger Corridors Specific Plan was established to orchestrate private and public investment activities along the Beach Boulevard and Edinger Avenue corridors, and to support and promote investment to enhance the beauty and vitality of the City's primary commercial corridors. This specific plan presents the community's vision for the evolution and continued growth of the corridors, and it establishes the primary means of regulating land use and development within the plan area.

The plan includes a program of planned actions and investments to stimulate and complement private investment along the corridors. The plan primarily addresses conceptual guidelines for future development along Beach and Edinger Boulevards. There is no mention of bicycle facilities.

Downtown Specific Plan

This plan calls for new bicycle facilities to be provided *"... to provide additional incentive for more people to bike to and from downtown, and to better serve the large number of existing bicycle enthusiasts."* New facilities include two connections to the beach near 1st and 6th Streets across Pacific Coast Highway, to better link the Beach Multi-use Path with downtown.

Class 2 lanes are proposed on 6th Street between PCH and Main Street, continuing on Acacia Avenue to Lake Street. Class 2 lanes are also proposed for Atlanta and Orange Avenues between Huntington and Lake Streets, which would connect with existing Class 2 facilities on Lake Street.

Due to limited existing rights-of-way, only Class 3 route signage is proposed for 3rd Street between Orange and Walnut Avenues and on Orange Avenue between Lake and 6th Streets.

The other major recommendation is additional bicycle parking, including on-street racks at the ends of diagonal vehicle parking, on sidewalks along no-parking zones, within wider sidewalk areas and curb extensions, and adjacent to buildings out of the walking path. The plan also suggests additional bicycle parking facilities on the beach side of PCH, including the potential for a high-capacity facility near or under the pier, or within existing pier parking areas.

Finally, the plan suggests a bicycle station, the potential for using City-owned paseos for bicycle parking, and providing some within private developments, such as inside parking structures.

Sunset Beach Specific Plan

This plan addresses a recently annexed area of the County into the City of Huntington Beach. Of particular interest for mobility planning are the following statements:

"Because of the constraints inherent in acquiring additional right-of-way for Pacific Coast Highway both within and outside of Sunset Beach, it may be impractical to provide additional travel lanes. Better utilization of the existing right-of-way is a more realistic possibility. As new development and redevelopment occurs, improvements can be made that provide for safe and convenient use of the Highway by pedestrians, cyclists, and transit vehicles."

"Increased transit service and bicycling opportunities should provide access to beach uses without requiring...additional parking."

"It is expected that the existing 15 miles per hour speed limit on all Sunset Beach Streets, except Pacific Coast Highway, will be retained."

To improve bicycle parking availability in the immediate are, this plan requires bicycle parking consistent with the City of Huntington Beach Zoning and Subdivision Ordinance Chapter 231. These requirements would apply to new development.

The plan also states: *"From the ocean front property line to the ocean there shall be no roadway, bicycle path, hiking trail, or parking facility."*

California State Parks General Plan - Huntington and Bolsa Chica State Beaches

The California Department of Parks and Recreation ("State Parks") mission is, in part, is "*...to provide for the health, inspiration and education of the people of California by preserving the State's extraordinary biodiversity, protecting its most valued natural and cultural resources and creating opportunities for high quality outdoor recreation*." State Parks is therefore entrusted with protecting the natural, cultural and recreational resources of the two local state parks, Huntington and Bolsa Chica State Beaches.

This directly affects any nonmotorized mobility planning effort because the existing Class 1 multi-use path along the beach runs through the two parks. In fact, State Parks owns and maintains the majority of the beach path in Huntington Beach. This means that any proposed changes will need to be coordinated with State Parks and assessed under its plans and policies. As important as the beach path is to Huntington Beach's community identity, maintaining the continuity of beachfront path will be paramount and State Parks has long been an valued partner.

LAB Bicycle Friendly Community Application

A League of American Bicyclists' (LAB) Bicycle Friendly Community (BFC) application was submitted for the City of Huntington Beach in the fall of 2010. There was interest in submitting earlier, but upon review of the application questions, the decision was made to try to formalize and implement as many bicycle-friendly elements as possible prior to submission. This is typical of many cities submitting Bicycle Friendly Community applications.

The LAB awarded Huntington Beach a Bronze level designation and provided several suggestions for a future successful application. The top five suggestions were for the City to update and fully implement a Bicycle Master Plan, expand a Safe Routes to School Program to include all schools, increase the amount of secure bicycle parking, expand and increase network connectivity by providing a broader range of facility choices for users of various abilities and comfort levels, and implement innovative techniques to improve on-road conditions such as bicycle cut-throughs, cycle tracks and road diets to calm traffic and a better use of roadway space.

Commuter Bikeways Strategic Plan (CBSP)

The *Commuter Bikeways Strategic Plan* (CBSP) serves as Orange County's bicycle master plan. It was developed in 2009 by the Orange County Transportation Authority (OCTA) to encourage the enhancement of Orange County's regional bikeways network as a way to make bicycle commuting a more viable and attractive travel option.

A number of challenges must be overcome for Orange County to excel as a cycling region, including improving safety and access to key destinations, as well as providing better plan coordination and support facilities. Cycling is recognized as having a significant role in mitigating congestion, climate change and oil dependency. The goal of the CBSP is to help address these many challenges by providing:

- *A strategy for improving the regional bikeway network*
- *Eligibility for Bicycle Transportation Account (BTA) funds*
- *Identification of roles and responsibilities for OCTA regarding bikeways*
- *Documentation of existing and planned Orange County bikeways.*

The projects described in the CBSP are a compilation of projects planned by Orange County communities and the County of Orange. The CBSP is a long-range, financially unconstrained planning document. It will be the responsibility of each implementing agency to identify funding sources for the projects within their purview.

This plan identifies 18.4 miles of proposed bikeways for Huntington Beach.

Districts 1 and 2 Bikeway Strategic Plan

This study is part of an overall OCTA effort to develop bikeways strategy and feasibility studies for Orange County. Based on facilitation efforts, these feasibility studies will identify regional bikeway corridors that connect major activity centers including employment areas, transit stations, colleges and universities.

This plan will highlight and improve upon regional bikeway connections through these two districts. A similar effort was recently completed for District 4 and will serve as the model for this and any other district-level plans to come.

Master Plan of Arterial Highways (MPAH)

The *Master Plan of Arterial Highways* (MPAH) depicts a county-wide roadway network intended to ensure coordinated transportation system development among local jurisdictions within Orange County. The MPAH's main purpose is to describe an arterial highway system that effectively serves existing and adopted future land uses in both incorporated and unincorporated areas of Orange County. Extensive coordination with the transportation and land use planning and implementation processes conducted by the cities, the County, and adjacent jurisdictions is essential for the MPAH to provide its intended service for goods movement and for travelers across all modes. Given existing right-of-way limitations, the MPAH also encourages recognition of operations techniques, primarily signal synchronization, within the MPAH planning process. Recognition of this component of the arterial highway network is to emphasize that operational strategies work best as part of a systematic, region-wide application of programs and projects aimed at improving system wide efficiency.

2. Goal: Provide an Arterial Highway System that Supports Land Use Policies of the County and Cities

Policies:

2.2 The MPAH will encourage an arterial highway system designed to serve as part of a balanced transportation system (auto, rail, transit, bus, truck, bicycle, pedestrian, etc.).

2.3 OCTA will encourage local jurisdictions to consider and evaluate all mobility needs when requesting modifications to the MPAH.

3.9.3 Smart Streets

The MPAH also recognizes Smart Streets as arterials with enhanced traffic-carrying capacity. These augmentations in capacity are achieved by a variety of measures, including, but not limited to:

- *Preferential and acceptably maintained traffic signal timing and synchronization*
- *Prohibition of on-street parking*
- *Intersection grade separations of critical through and/or turn movements*
- *Addition of at-grade through or turn lanes at intersections*

- *Access limitation to right turns only, or no access (street and/or driveways)*
- *Access consolidation*
- *Frontage roads*
- *Pedestrian grade separations*
- *Other elements that may be documented to be useful*

The intent of these measures is to minimize conflicts with cross traffic by improving traffic carrying capacity and facilitating improved traffic flow along arterials. The terms "High Flow Arterial, "Continuous Flow Boulevard, "or "Signal Synchronization Corridors" can also be used to describe a "Smart Street." This designation is intended to represent a roadway of a Primary, Major or a Principal arterial classification.

It should be noted that an MPAH roadway unilaterally removed from or downgraded on the local agency's Circulation Element, and/or does not meet the capacity criteria, will result in the local agency becoming ineligible to participate in the Orange County Combined Transportation Funding Programs (CTFP). Therefore, any bicycle project impacts on MPAH roadway carrying capacity should be carefully evaluated. Beach Boulevard is the only roadway within the City of Huntington Beach identified as a Smart Street.

City of Costa Mesa

With the adoption of a General Plan in 1992, the 1974 *Master Plan of Bikeways* was revised and incorporated and has been periodically updated. Maps were not provided in the 2000 General Plan. The 2009 *Commuter Bikeways Strategic Plan* calls for 13.6 additional miles of bicycle facilities throughout the city.

City of Fountain Valley

Fountain Valley's bicycle master plan is part of their 1995 General Plan and is based on the *Orange County Master Plan of Countywide Bikeways* (which predates the CBSP). The Circulation Element was last updated in 2008. The 2009 *Commuter Bikeways Strategic Plan* calls for three additional miles of bicycle facilities throughout the City.

City of Newport Beach

The 2006 Newport Beach *Master Plan of Bikeways* shows all the facilities within Newport Beach. This plan is also incorporated as part of the City's 2006 General Plan. Connections into Huntington Beach include bicycle lanes on Pacific Coast Highway. Recently, Shared Lane Markings or "Sharrows" have been implemented on Pacific Coast Highway.

The bicycle advocacy group, bikeNewportBeach has been active in advocating for bicycle facilities and has been instrumental in increasing cycling awareness in Newport Beach and surrounding cities.

The 2009 *Commuter Bikeways Strategic Plan* calls for 16.7 additional miles of bicycle facilities throughout Newport Beach.

City of Seal Beach

The City of Seal Beach does not have a stand-alone bicycle master plan. Planned bicycle facilities are part of the 2003 Circulation Element of the city's General Plan. Planned connections with Huntington Beach include bicycle lanes on Pacific Coast Highway and Westminster Avenue.

City of Westminster

Existing and future bicycle facilities are part of City of Westminster's *Master Plan of Bicycle Routes* within the General Plan. One planned bicycle lane on Heil Avenue would connect with the City of Huntington Beach. Other bicycle facilities are planned on Bolsa Chica, Newland and Goldenwest Streets, McFadden Avenue and Westminster Boulevard, but specific facility types have not been determined.

Bolsa Chica Ecological Reserve

Bolsa Chica Ecological Reserve is a nature reserve lying within the footprint of the City of Huntington Beach. It is designated by the California Department of Fish and Wildlife to protect a coastal wetland, with its resident threatened and endangered species. Current policies restrict reserve access to pedestrian and disabled uses of designated trails.

2.2 Existing Facilities

Existing Bikeway Facilities

The following tables summarize existing bicycle facilities within Huntington Beach city limits.

Table 1: Ex. Class 1 Multi-Use Paths	Miles	Notes
Huntington Beach Multi-use Beach Path	8.4	Between southern City limit and Warner Avenue
Santa Ana River Channel (West)	0.4	2,200' segment between Brookhurst Street and Santa Ana River Trail; follows Santa Ana River just outside City limits
Total	**8.8**	

Table 2: Ex. Class 2 Lanes	Miles	Notes
Adams Avenue	1.2	
Algonquin Street	0.5	
Atlanta Avenue	2.1	Westbound only between Brookhurst Street and Surge Lane
Banning Avenue	0.8	
Bolsa Avenue	1.5	
Bolsa Chica Street	2.2	
Brookhurst Street	0.2	
Bushard Street	3.4	
Edinger Avenue	3.5	Westbound only between Bolsa Chica and Graham Streets
Edwards Street	4.4	
Ellis Avenue	1.0	
First Street	0.2	
Garfield Avenue	4.5	
Goldenwest Street	4.6	Southbound only between Bluebonnet Drive and Edinger Avenue
Gothard Street	3.8	
Graham Street	1.5	Northbound only between Edinger Avenue and Cross Drive
Hamilton Avenue	1.7	Westbound only between Newland Street and Seaforth Lane
Heil Avenue	3.8	No eastbound bicycle lanes between Regina Circle and Plaza Lane
Huntington Street	0.2	
Indianapolis Avenue	2.0	
Lake Street	1.2	
Magnolia Street	3.3	
Main Street	1.8	
McFadden Avenue	2.5	
Newland Street	4.6	

Table 2: Ex. Class 2 Lanes	Miles	Notes
Pacific Coast Highway	1.7	Northbound only between Huntington Street and start of parking lanes
Palm Avenue	0.5	Northbound only between Seapoint Street and Camelback Drive
Peninsula Lane	0.1	
Promenade Parkway	0.4	
Saybrook Lane	0.5	
Seapoint Street	0.9	
Seventeenth Street	1.0	
Skylab Road	0.0	
Slater Avenue	3.0	
Springdale Street	1.9	
Summit Drive	0.8	
Pacific Avenue (Sunset Beach)	0.2	
Talbert Avenue	1.1	
Ward Street	0.5	
Warner Avenue	4.9	
Yorktown Avenue	3.5	
Total	**77.8**	

Table 3: Ex. Class 3 Routes	Miles	Notes
Newland Street	0.5	Between Talbert Avenue and Springhurst Drive
Total	**0.5**	

Table 4: Ex. Route/Lane Combination		
	Miles	**Notes**
Heil Ave	0.25	Westbound lanes only between Regina Circle and Plaza Lane
Main Street	0.1	Southbound lanes between Ellis Avenue and Florida Street
Newland Street	0.4	Northbound lanes between Slater Avenue/Friesland Drive and Talbert Avenue/Springhurst Drive
Total	**1.0**	

Table 5: Ex. Wide Walkways	Miles	Notes
Langenbeck Park Path	0.6	Wide walkway through Langenbeck Park/Edison right-of-way
Union Pacific ROW	0.3	Gated and currently not open for general public
Edison Greenway	0.7	Walkway between Bushard and Brookhurst Streets
Total	**1.6**	

The following figures represent data collected to date. These data sets were also presented at the first community workshop and have been updated based on input from City staff, workshop input, online survey responses and field work. This information is particularly important because it directly affects subsequent recommendations.

Figure 2: Existing Bicycle Facilities

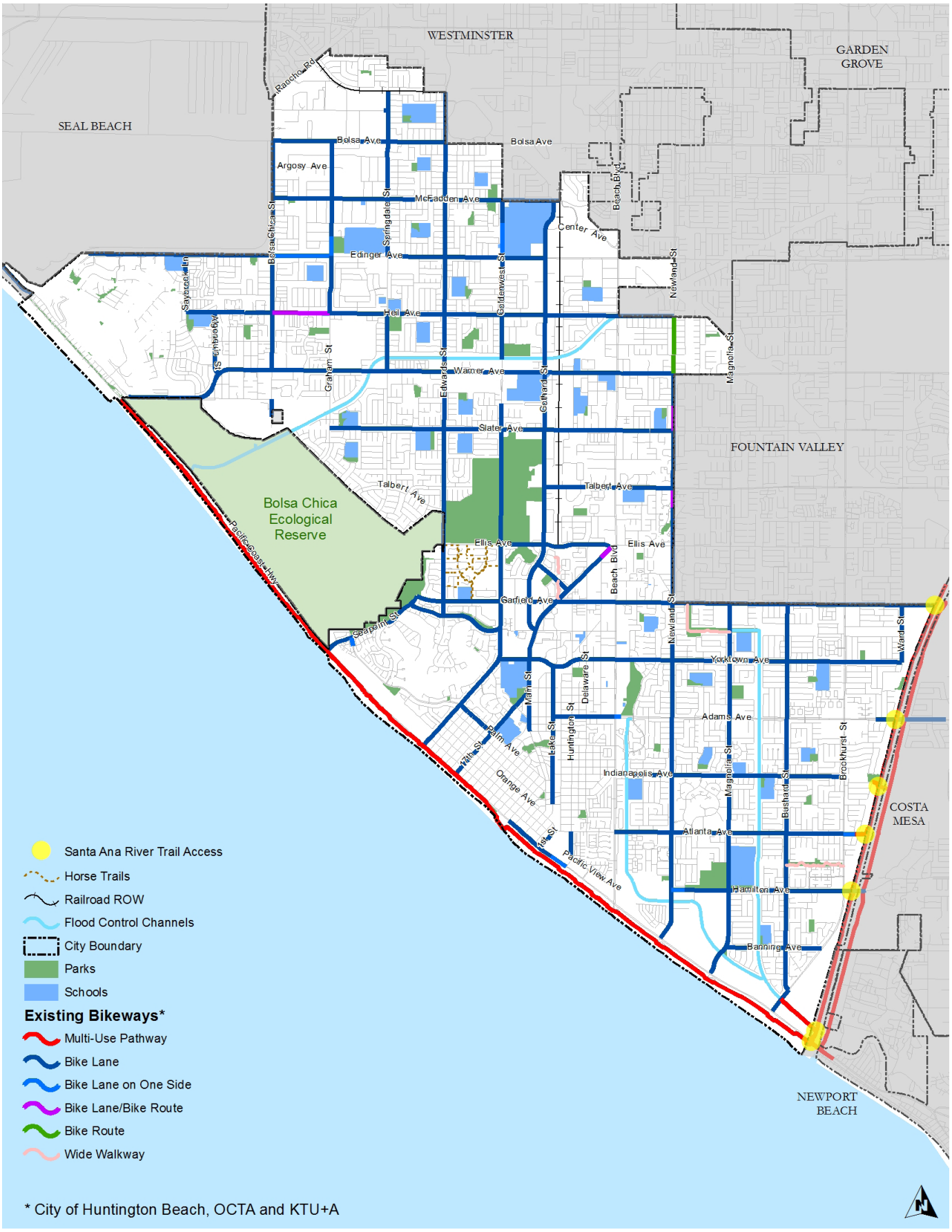


Figure 3: Circulation Element Bicycle Facilities

Figure 4: Bicycle To Work Density

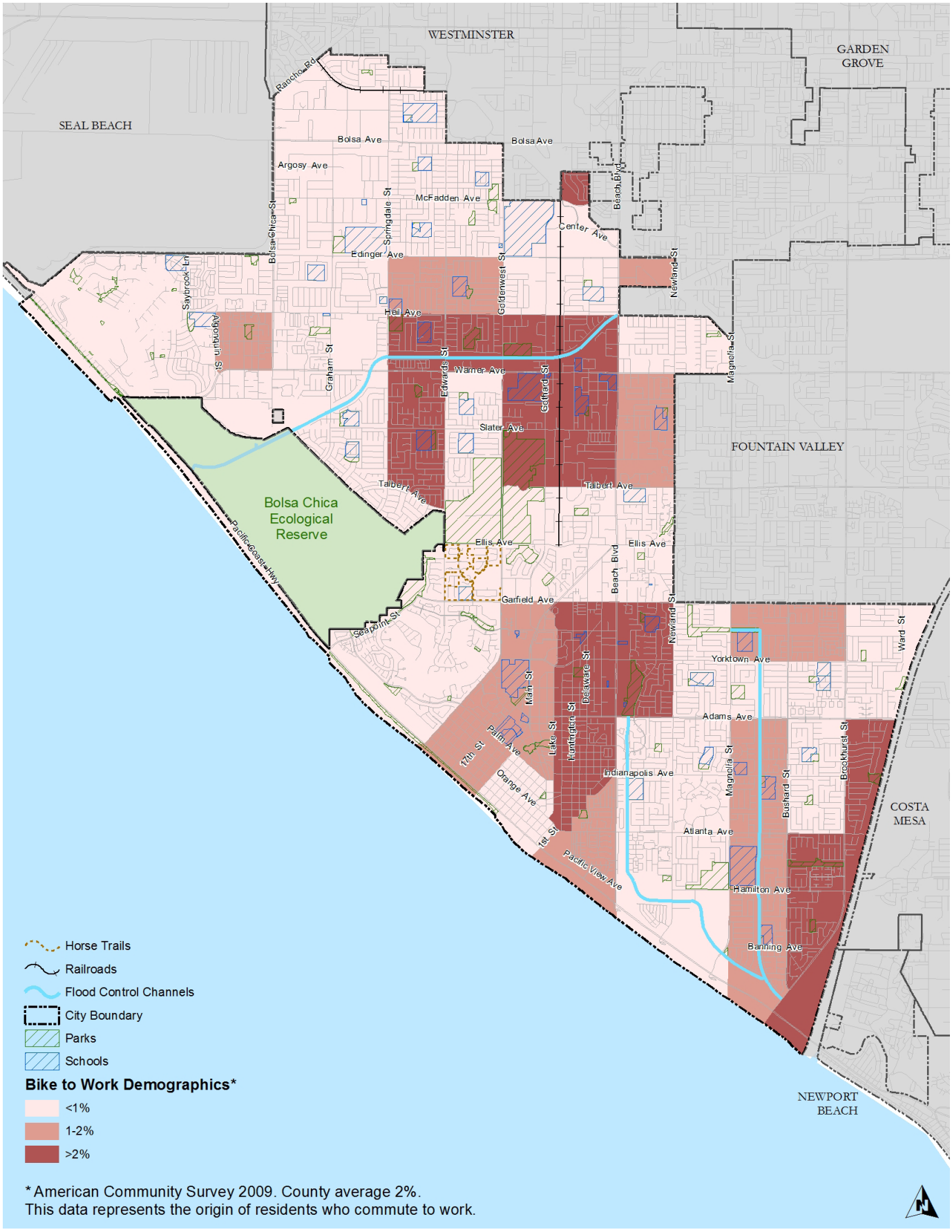
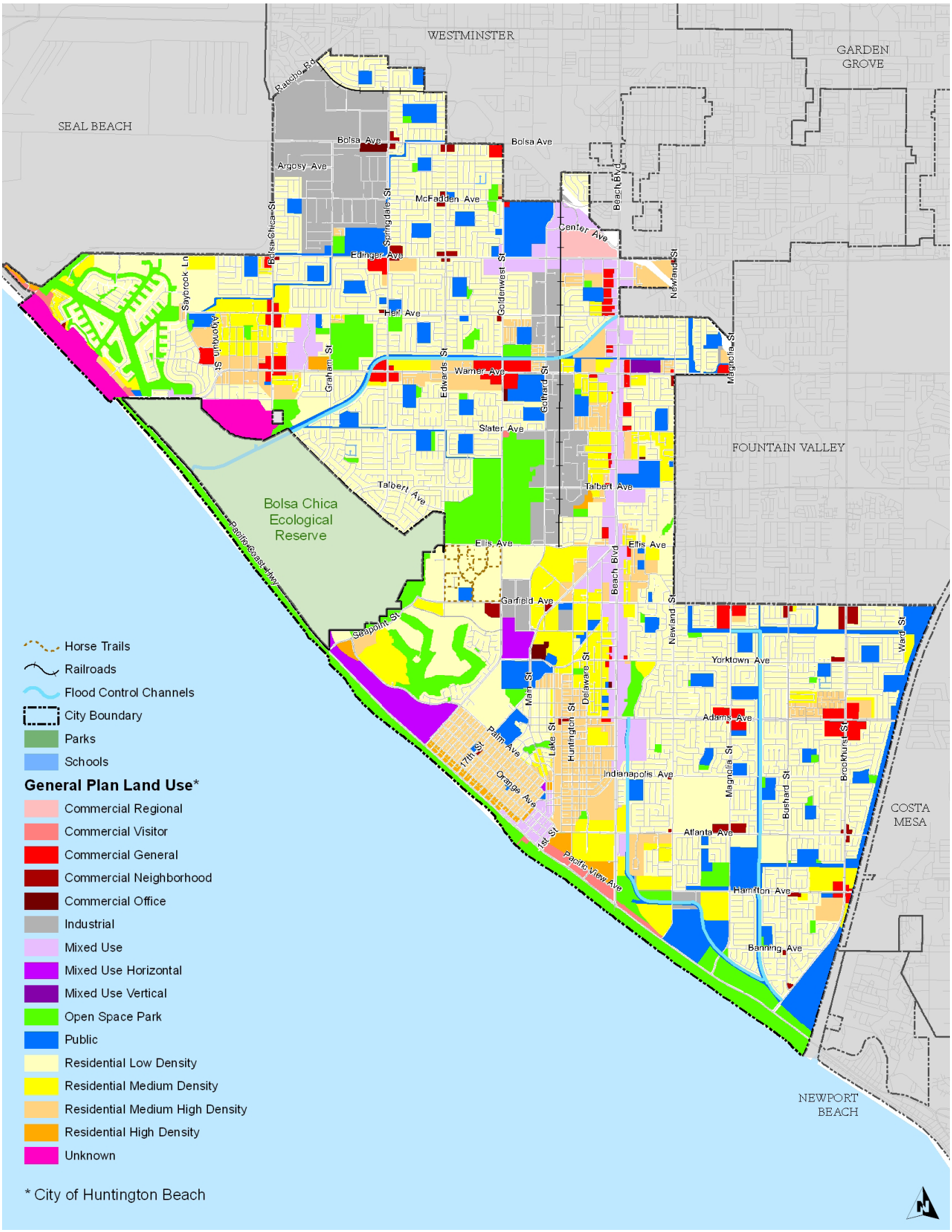


Figure 5: General Plan Land Use



Bicycle Parking Assessment

Adequate bicycle parking is essential for a bikeway network to be used to its full potential and 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. Increased bicycle parking provides an option for individuals who need to make a short trip to local retail and other services to ride their bicycle rather than drive their car. Bicycle racks should support the bicycle at two points and make it easy to use a U-shaped lock to secure the frame of the bicycle to the rack.

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, such as downtown district, the Huntington Beach Pier, parks and shopping centers, increased bicycle parking is recommended.

Bicycle parking can be found along the Huntington Beach Multi-use Path and just below the pier entrance. Bicycle parking also exists in the downtown area, some at store fronts, on the street adjacent to angled parked and in the paseos. Bicycle parking can also be found at all the recreation centers, libraries and major parks. Most neighborhood parks lack bicycle parking. All schools have some form of bicycle parking, from simple schoolyard racks to a more secure parking like a bicycle cage at Isaac L. Sowers Middle School.

Insufficient bicycle parking is a significant issue, especially along the beach and downtown during the summer, but also during events in these areas at other times of the year. This lack of adequate bicycle parking was reflected in online survey responses as the highest scoring from among a list of suggested improvement about what would affect respondents' decisions to ride more often. (See Appendix C: Community Input Summary.)

Bicycle parking within the beach and downtown areas is routinely filled to capacity and beyond. Available racks fill early and later arrivals squeeze their bicycles in and even pile theirs on top of others. This was observed throughout the summer, especially under the pier. This can make extricating a bicycle particularly difficult and probably dissuades some cyclists from using the racks, and perhaps from even riding to their destination versus driving.

Regional Bikeways

According to the OCTA's *Commuter Bikeways Strategic Plan* (CBSP), the two regional bikeway connections within Huntington Beach are the Pacific Coast Highway and the Santa Ana River Trail. However, the City's existing bikeway network is conducive to regional travel since many arterials have bicycle lanes and connect to adjacent communities.

OCTA is currently developing a *Districts 1 and 2 Bikeway Strategic Plan* that will highlight and improve upon regional bikeway connections through these two districts. A similar effort was recently completed for District 4 and will serve as the model for this and any other district-level plans to come.

Nearby segments of the Santa Ana River Trail

2.3 Existing Programs

Education

Bicycle Classes

The City sponsors scheduled bicycle classes in City parks to serve all sectors of the community. The classes are currently priced at $12 per student to make them economically available to everyone in the community, including the traditionally underserved. Students who qualify in the very low income category are also eligible for City Instructional Class Scholarships. Families on Bikes Classes are offered for families with elementary school children. Street Skills Classes are offered for anyone 14 years old and older.

These classes and events are announced on the Community Services web site (*www.hbsands.org*) with details and instructions on how to participate. The same information and instructions are distributed quarterly, for free, via the hardcopy *HB Sands* community services guide magazines throughout the City. Other City events, including bicycle-related events, are announced and described on the City web site, *www.huntingtonbeachca.gov*. Special event announcements and educational videos, including cycling videos, are shown on the City public information cable channel HB3.

Police Education

The City has developed *Police In-Service Training for Bicycle Safety and Enforcement* focusing on the California Vehicle Code as it applies to cyclists, the real risks for cyclists, how to recognize safe lawful cyclist behavior, "share the road" principles, and unlawful/dangerous cyclist and vehicle driver behavior that should be targeted for education and/or enforcement.

Encouragement

Bicycle Valet Service

Huntington Beach maintains a very successful bicycle valet parking program to encourage residents to ride to the downtown beach area and events. This effectively reduces vehicle parking congestion during particularly high use periods.

Major Annual Events

Huntington Beach has a large population of cyclists who find it easier to ride than drive to special events. The City sponsors numerous events in the beach area near the pier (one or two per month) to which attendees are encouraged to arrive by bicycle via the very popular Huntington Beach Multi-use Beach Path. Large-scale bicycle parking facilities and the bicycle valet service are provided and the public responds in large numbers, resulting in many bicycles parked in the pier area during these events. Bicycles are an especially significant transportation choice for the City's annual Fourth of July celebration, which draws thousands. Summer Sundays band concerts in Central Park are attended by many picnickers who arrive by bicycle. The same is true for the City's Concerts on the Beach, weekly street fairs and open air market.

City of Huntington Beach Employee Rideshare Coordinator and Program

The City rideshare coordinator promotes Bike to Work Day for City employees in May with incentives and prizes. Other City encouragement programs include Dump the Pump Week, Earth Week and Ride Share Week. Bike to Work Day is also promoted in Huntington Beach and throughout Orange County by the Orange County Transit Authority (OCTA) via its web site and special events.

City of Huntington Beach Employee Shower and Changing Facilities

These facilities are available to employee cyclists in City facilities including City Hall, Fire Department Facilities, Police Facilities and some Public Works facilities.

Expanded Bicycle Event Publicity Efforts

The City shows cycling oriented videos on Public Information TV Channel HB3. HuBBA distributes fliers to bicycle shops and libraries publicizing bicycle events, including upcoming cycling classes.

Action Plan for Bicycle Friendly Communities

The Mayor and City Council members have signed an *Action Plan for Bicycle Friendly Communities*, provided by the League of American Bicyclists (LAB), which includes a commitment to: "*Establish information programs to promote bicycling for all purposes, and to communicate the many benefits of bicycling to residents and businesses*"; and "*Develop special programs to encourage bicycle use in communities where significant segments of the population do not drive (e.g. through Safe Routes to Schools programs) and where short trips are most common.*"

City Web Site

The City's web site offers information on local routes and upcoming bicycle events. Additionally, the Huntington Beach Marketing and Visitors Bureau (MVB) promotes cycling on their web site at: *http://www.surfcityusa.com/things-to-do-activities/Bicycling*.

Bicycle Diversion Course

Since 1973, the City of Huntington Beach has conducted a nationally recognized bicycle diversion course for children who have been stopped by the Police Department for a safety violation (typically helmet violations). The individual has the option to attend a two hour safety course held by the Police Department or be directed to pay the full fine of the ticket. A parent or guardian's attendance is mandatory. The safety course is well attended on a monthly basis and can also be attended by the general public.

Enforcement

Targeted Enforcement

The City of Huntington Police Department conducts targeted enforcement days of cyclists and vehicle drivers involved in cycling-related incidents.

2.4 Trip Origins and Destinations

Evaluation and Planning

Bicycle Advisory Committee

The Bicycle Advisory Committee (BAC) meets regularly to assist the City with implementation of plan projects, policies and programs. The BAC allows City Council and staff, volunteers and bicycle advocates to continue efforts to improve cycling throughout the City. This group acts as a community liaison and addresses issues of concern of local cyclists.

Bicycle Map

The City provides a map available as a digital download from the City web site. The map shows bikeway facilities, popular destinations and other important locations throughout Huntington Beach.

"Complete Streets" Policy

The City of Huntington Beach has adopted a "complete streets" policy to make sure that every street accommodates cyclists, pedestrians, vehicle drivers and transit users. A complete streets policy enhances the effectiveness of bicycle use throughout the City by having facilities that will accommodate bicycle travel, as well as walking and vehicle driving.

Safe Routes to School

This funding can be used for a variety of activities including site specific evaluation and planning, infrastructure costs and education programs. The Public Works Department of the City of Huntington Beach has successfully used the Safe Routes to School Grant program to obtain funding for physical improvements through capital grants.

Origin and Destination Summary

A number of factors drive bikeway facility recommendations. The maps on the following illustrate those analyzed for this plan, including those required to be considered by the bikeway master planning enabling legislation, *California Streets and Highways Code Section 891.2*. These factors include land use, existing and future population and employment density and activity centers.

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 the typical activity center users, they also represent significant numbers of employees. The civic activity centers include Huntington Beach's parks and schools.

These centers particularly define trip origins and destinations, and generally include residential areas, employment centers, parks, schools and civic centers. Most cities have unique origins and destinations, as well as special events and variations in seasonal demand. This is especially true of Huntington Beach with its high levels of bicycle use in the popular beach area, as well as a number of beach-related events during the summer months.

Reviewing Figure 6: Activity Centers, confirms that most major employers, office buildings and industrial sites are clustered in specific areas generally associated with the main thoroughfares running through Huntington Beach. Employment density is 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.

Overall, activity centers tend to lie within an acceptable distance from their nearest adjacent bicycle facilities. This is supported by the locally gentle topography that drove the development pattern of a traditional street grid that provides multiple routes to any particular destination.

Figure 6: Activity Centers

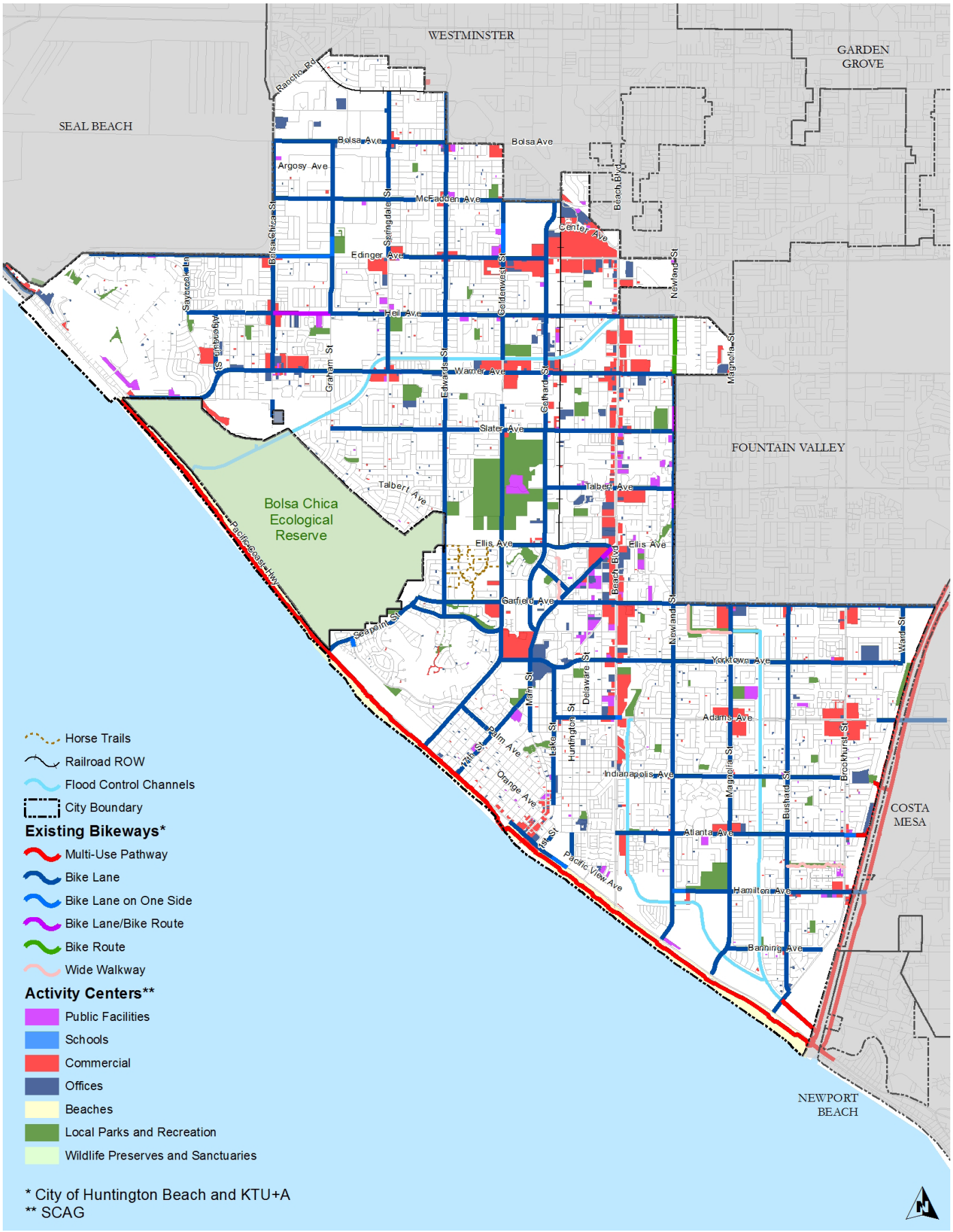


Figure 7: Existing Population Density

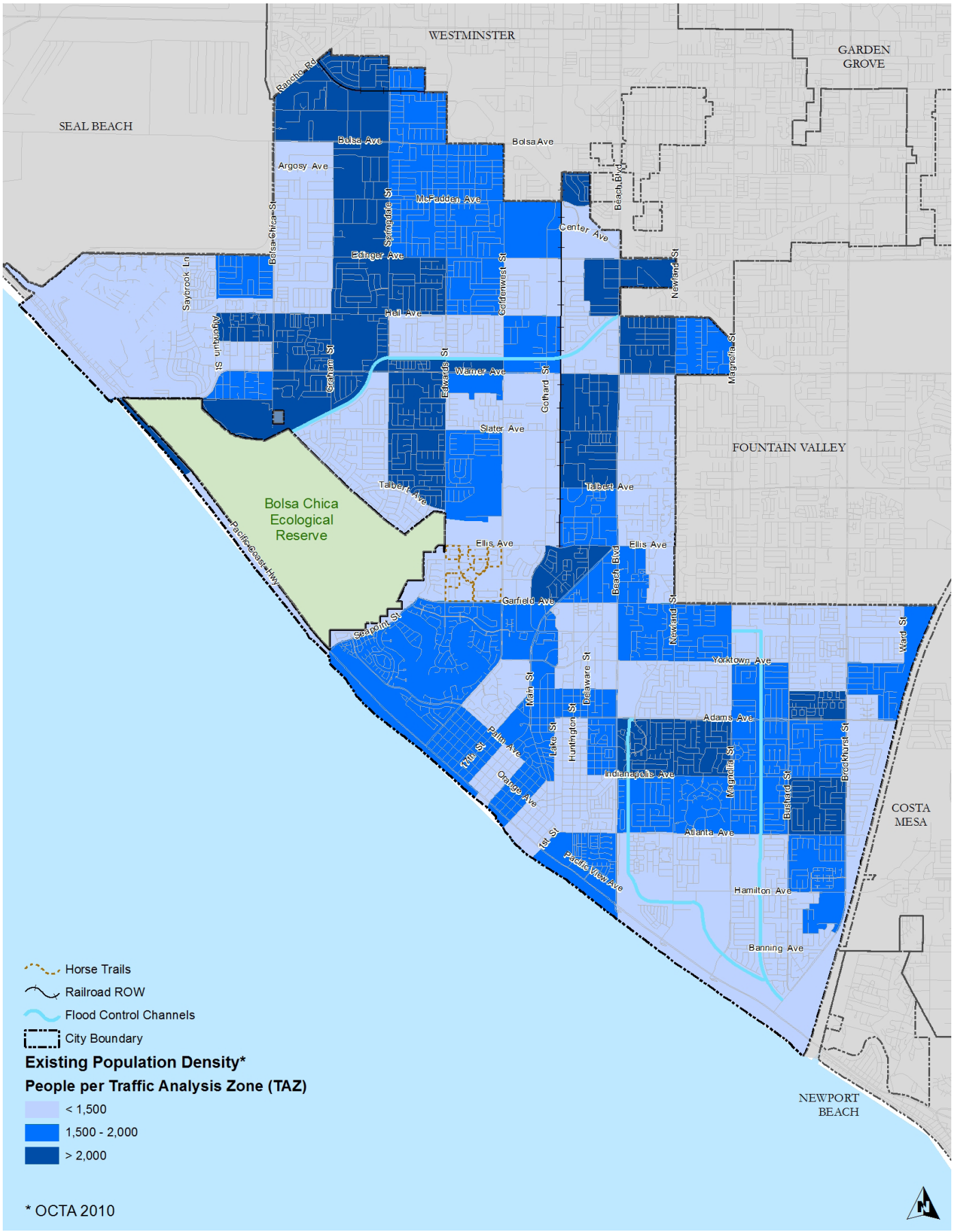


Figure 8: 2035 Population Density

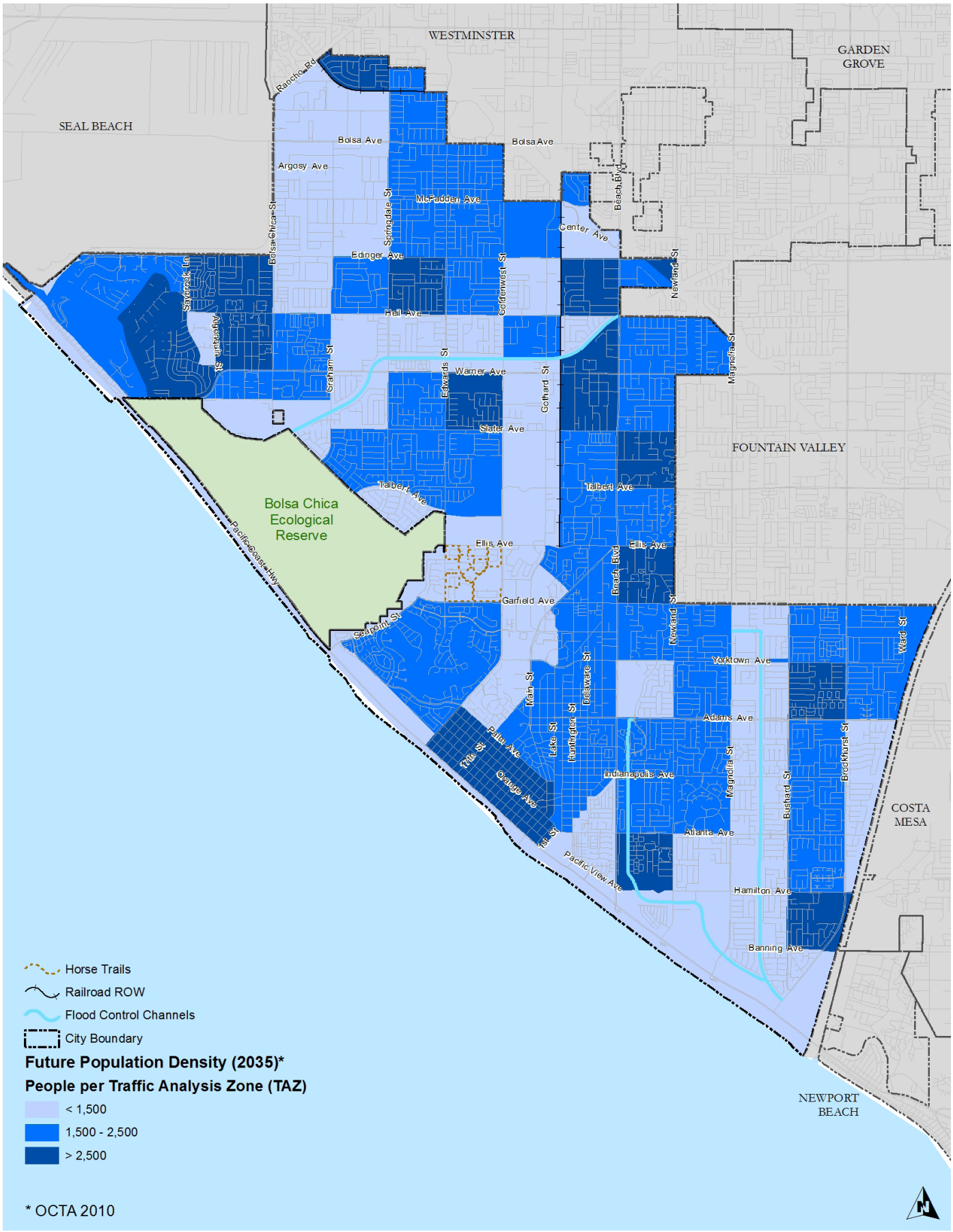


Figure 9: Employment Density

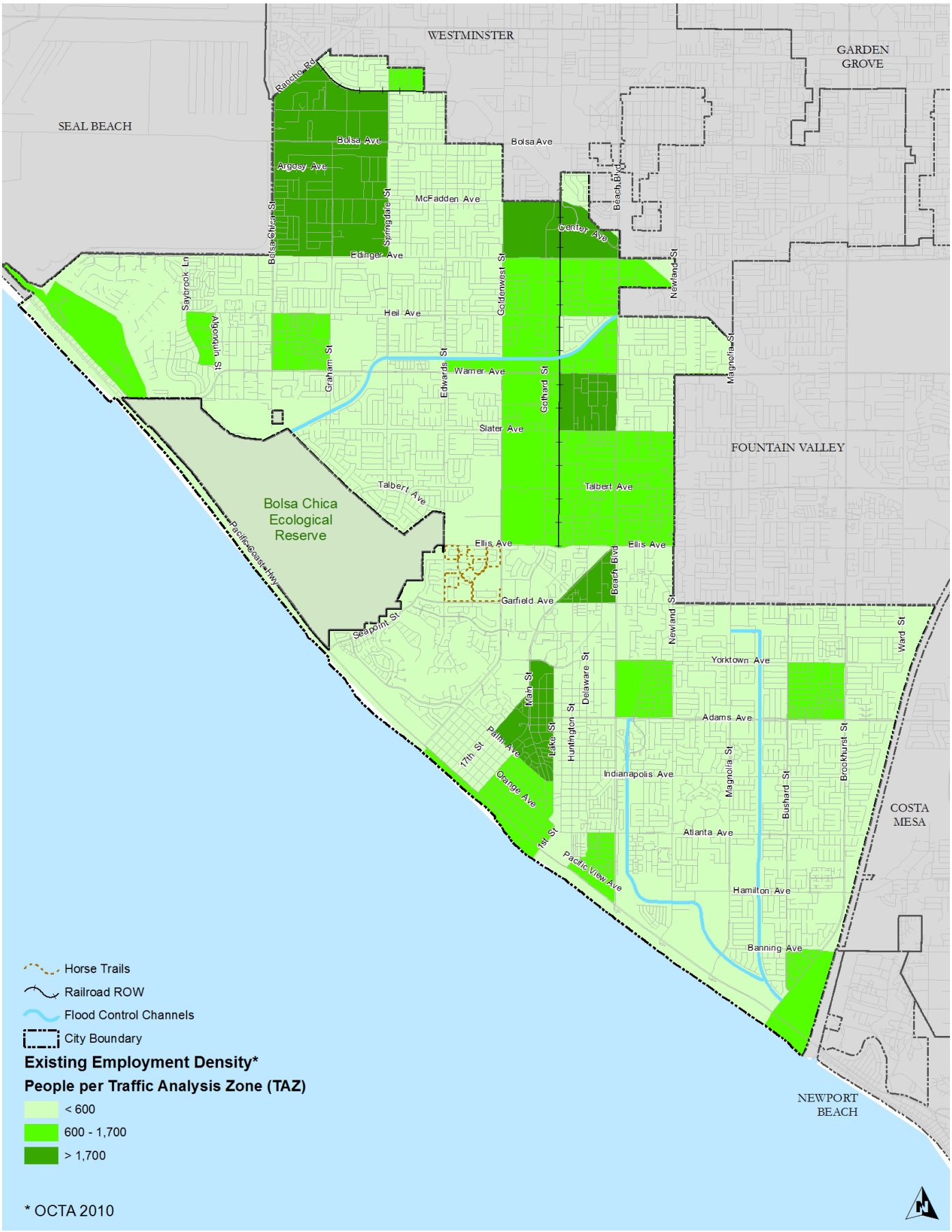
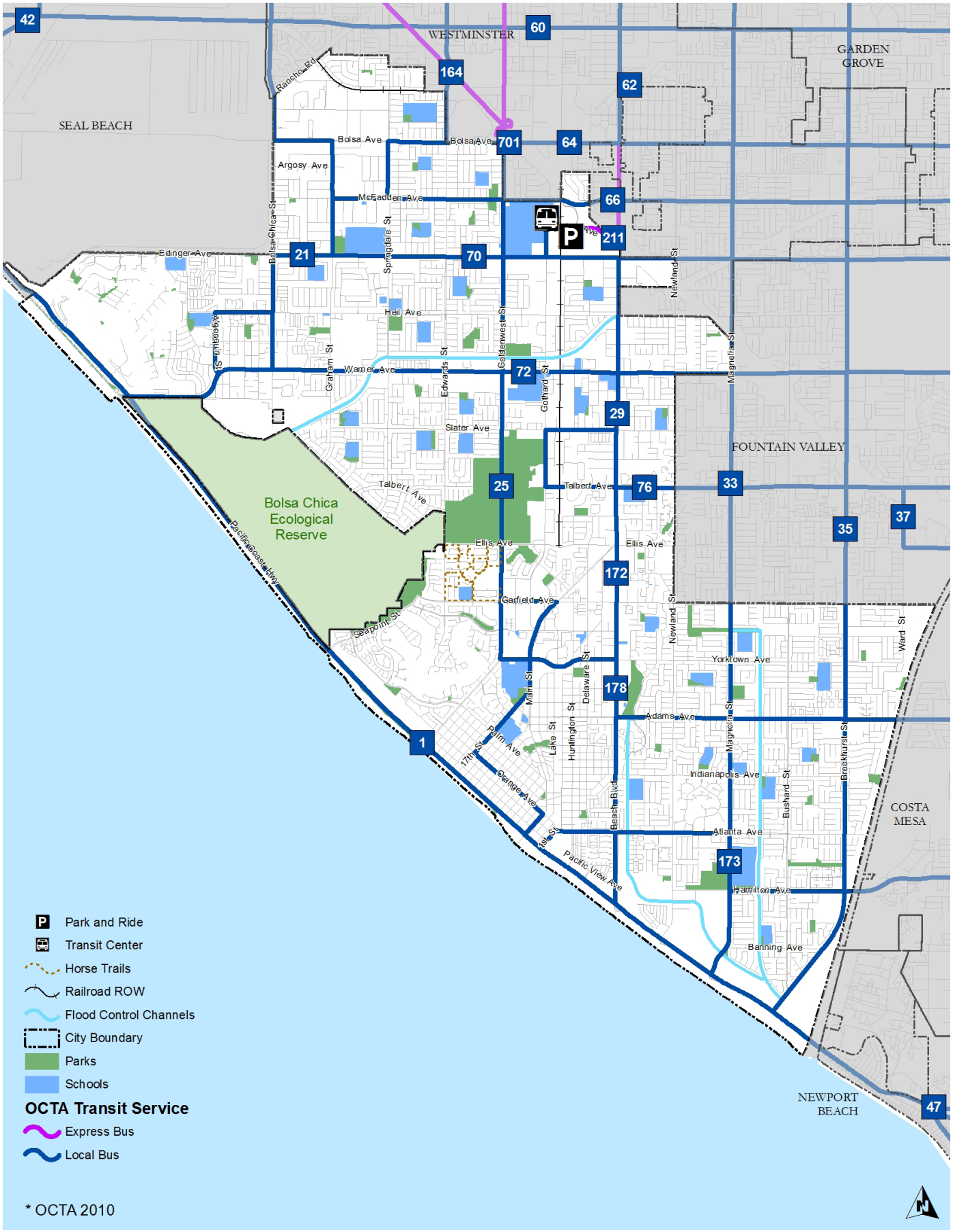


Figure 10: Transit Service



2.5 Safety Analysis

Collision Summary

Collision data were derived from the California Highway Patrol *Statewide Integrated Traffic Records System* (SWITRS). These data represent all reported bicycle/vehicle-related collisions occurring in Huntington Beach during the five year period from January 2006 through December 2010. Collisions that occurred on off-street paths are not included in the SWITRS 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 the SWITRS data.

During this five year period, there were over 700 bicycle/vehicle-related collisions, including two fatalities. For the purposes of this analysis, the collision data were reviewed in terms of collisions that occurred at intersections and those that occurred on road segments. Any collision occurring at or within 100 feet of an intersection was assigned to that intersection, while collisions occurring more than 100 feet from an intersection were assigned to that segment.

Table 6 lists the 10 intersections with the greatest number of bicycle-related collisions.

Table 6 – Top 10 Bicycle-Involved Collision Locations (Intersections), 2006-2010

Primary Street	Cross Street	Collisions
Warner Avenue	Beach Boulevard	8
Magnolia Street	Yorktown Avenue	6
Magnolia Street	Atlanta Avenue	6
Beach Boulevard	Talbert Avenue	5
Pacific Coast Hwy	1st Street	5
Bolsa Chica Street	Heil Avenue	5
Edinger Avenue	Springdale Street	5
Brookhurst Street	Adams Avenue	5
Warner Avenue	Gothard Street	5
Beach Boulevard	Indianapolis Avenue	4
Source: SWITRS, Fehr & Peers		
Notes: Collisions occurring 100 feet or closer to an intersection were assigned to the nearest intersection.		

In Figure 11, collision numbers are shown for each intersection and stratified based on the relative number of collisions. Figure 12 shows overall bicycle-involved collision density as variations in color shading.

There were two reported bicycle-involved collisions resulting in fatality in the five year study period*. These collisions occurred at:

- Brookhurst Street and Banning Avenue
- Brookhurst Street and Villa Pacific Drive

The collision density shown in Figure 12 indicates that collisions tend to occur along major streets and on or near clusters of residential uses, retail uses, or beach access points along Pacific Coast Highway. Corridors displaying a relatively high roadway segment collision density include:

- Beach Boulevard
- Pacific Coast Highway (PCH)
- Warner Avenue
- Heil Avenue
- Slater Avenue
- Main Street
- Yorktown Avenue
- Adams Avenue
- Atlanta Avenue
- Area bounded by PCH and Goldenwest, 1st and Delaware Streets

The components of the collision density analysis include a GIS based spatial analysis which captured collisions within close proximity of one another. The closer the collisions are from each other, the more intense the color. In Figure 12, the darker reds indicate a high concentration of collisions which was then matched up with the street network to show the areas of high bicycle collsions.

**There were two reported cyclist fatalities on Pacific Coast Highway in 2012, too recent to have been incorporated into available data sets.*

The roadway segment collision density appears to be concentrated at major intersections (in proximity to several top ten intersection collision locations) and east-west streets when compared to north-south streets. This likely largely reflects bicycle travel to and from the beach and associated destinations. It is also important to note that these data are based on the number of cyclist-involved collisions. The fact that many cyclist-involved collisions occur on major streets does not necessarily point to unsafe conditions. In fact, in terms of safety, the collision rates along these corridors may indicate relatively safe conditions since these routes are likely to reflect the greatest number of cyclists. Since there is insufficient cyclist data to develop bicycle collision rates, this collision analysis presents the next best available data for reviewing bicycle safety.

Additional data were reviewed for the 726 bicycle-involved collisions reported during the analysis period, including time of day and the severity of injuries.

Table 7 is a summary of time of day data for all bicycle-involved collisions in Huntington Beach. The time of day was grouped into four categories: school/business hours (7:00 AM-4:59 PM), evening hours (5:00 PM-8:59 PM), night hours (9:00 PM-2:59 AM), and morning hours (3:00 AM-6:59 AM). The greatest proportion of collisions occurred during school/business hours with 66 percent of the total, followed by evening hours at 24 percent of the total. Evening and night hours combined for 10 percent of the total bicycle-involved collisions.

Table 7 – Time of Day for Bicycle-Vehicle Collisions, 2006-2010

Time of Day	Percent of Total
7:00 AM-4:59 PM	66 Percent
5:00 PM-8:59 PM	24 Percent
9:00 PM-2:59 AM	7 Percent
3:00 AM-6:59 AM	3 Percent
Source: SWITRS, Fehr & Peers	

Table 8 is a summary of injury severity data for all bicycle-involved collisions in Huntington Beach. The collision data provide five categories as identified below, ranging from no injury information to fatality. The greatest proportion of collisions resulted in some visible injury with 55 percent of the total, followed by complaint of pain with 30 percent of the total. Severe or fatal injuries combined for less than three percent of the total bicycle-involved collisions.

Table 8 – Bicycle-Vehicle Collision Severity, 2006-2010

Injury Severity	Percent of Total
Injury – Complaint of Pain	30 Percent
Injury – Other Visible	55 Percent
Injury – Severe	2 Percent
Fatal	0.3 Percent
No Injury Indication	13 Percent
Source: SWITRS, Fehr & Peers	

Orange County Bicycle Coalition Collision Analysis - 2001-2012

On October 26, 2012, the Orange County Bicycle Coalition (OCBC) published an analysis of Huntington Beach bicycle collisions on their web site *(http://ocbike.org/2012/10/a-slice-of-huntington-beach/)* entitled "*A Slice of Huntington Beach*."

The article focused on reviewing primary factors for collisions in which a cyclist was killed or injured between January 2001 and July 2012. It also included an analysis of time of day and collision types. The data source was not provided, but a reference to the California Highway Patrol appears to indicate it was obtained from the *Statewide Integrated Traffic Records System* (SWITRS) database.

According to OCBC's analysis, there were 10 fatalities and 1,055 injuries within the period. Based on the data, 50 percent of fatalities were the fault of the cyclist, 30 percent were the fault of the vehicle driver and fault was undetermined for 20 percent. If the unknown fatalities were determined to be the fault of the cyclists, cyclists could be responsible for up to 70 percent of fatal bicycle-related collisions.

OCBC's analysis of the bicycle injury collision data indicates that cyclists were at fault in collisions just under 75 percent of the time. Approximately 46 percent of collisions identified the cyclist as at fault for riding on the wrong side or not far enough to the right of the road, in the opinion of the citing officer. It should be noted that while defining riding on the right side of the road is relatively straightforward, *California Vehicle Code Section 21202* requires some interpretation to determine when a cyclist is in violation. For example, the section states that cyclists must ride in the same direction and as close "*as practicable*" to the right-hand curb or edge of the roadway except under the following situations:

> *"When reasonably necessary to avoid conditions (including, but not limited to, fixed or moving objects, vehicles, bicycles, pedestrians, animals, surface hazards, or substandard width lanes) that make it unsafe to continue along the right-hand curb or edge, subject to the provisions of Section 21656. For purposes of this section, a "substandard width lane" is a lane that is too narrow for a bicycle and a vehicle to travel safely side-by-side within the lane."*

Additional OCBC research on collision time of day revealed that approximately 80 percent of collisions occurred between 6:00 AM and 6:00 PM, which were generally daylight hours. While it may not be surprising that the greatest number of collisions occur then, since it coincides with the most vehicle drivers and cyclists on the roads, this analysis may signal that education and enforcement efforts are needed to address issues not readily addressed through physical design or engineering solutions. This also concurs with the previous section's analysis conclusions.

The types of bicycle collisions were broken down by type, with "broadside" accounting for 53 percent of all collisions, followed by "other" at 16 percent and "sideswipe" at nine percent.

Complete bicycle-related collision rates would provide a more accurate assessment of cyclist safety than absolute numbers discussed here, but it is generally believed that many, if not the majority of non-fatal bicycle-related collisions go unreported.

Figure 11: Bicycle Related Collisions at Intersections

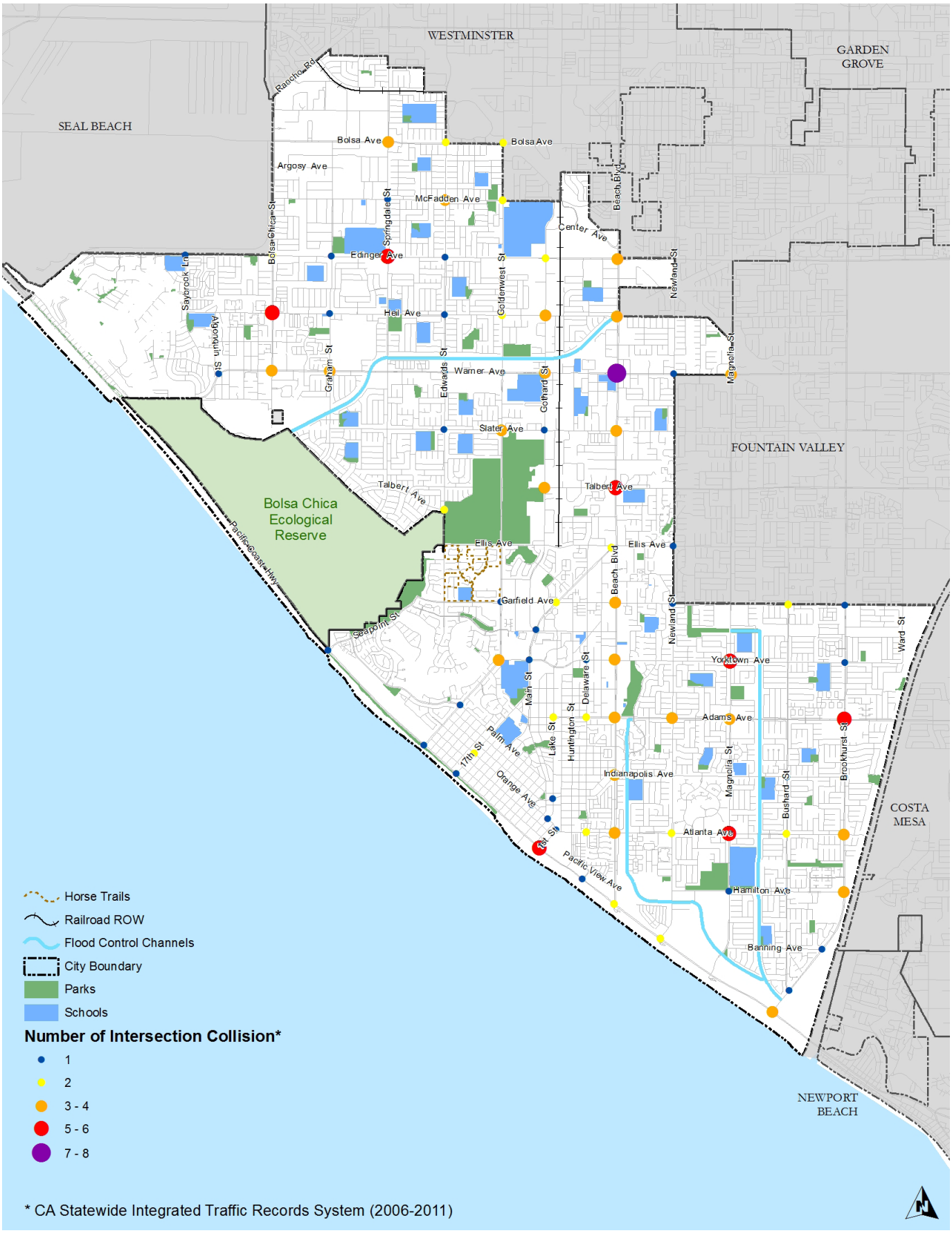
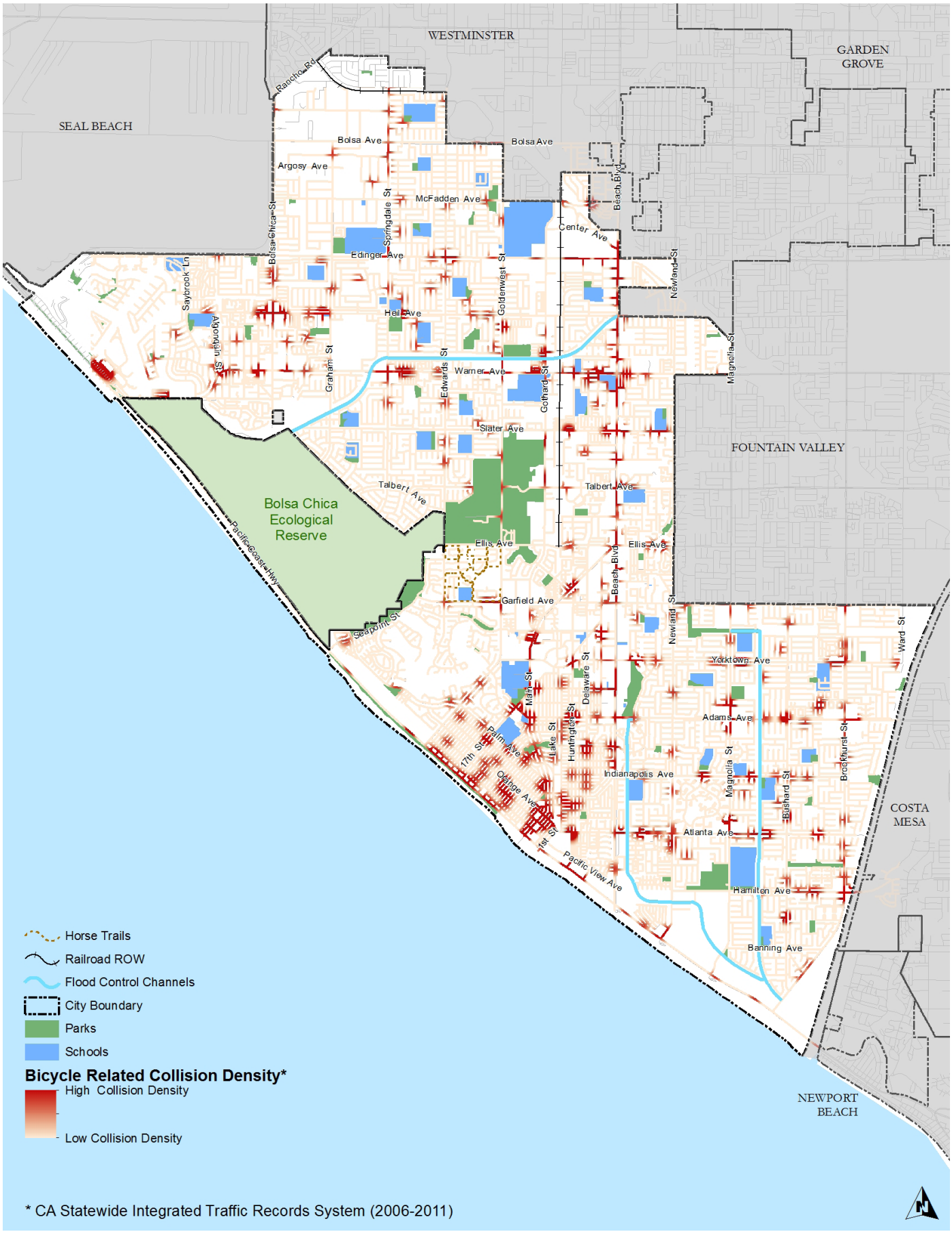


Figure 12: Bicycle Related Collision Density



High Traffic Volumes and Speeds

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, but even these riders are likely to choose quieter, less traveled routes that do not take them far out of their way, when given a choice. 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 Huntington Beach and illustrated on the next two pages.

Within the context of cyclist and pedestrian planning, high traffic volumes are commonly defined as more than 12,000 vehicles per day by the Federal Highway Administration (FHWA). In addition, cyclists are generally discouraged from sharing the roadway with vehicles when the posted speed limit exceeds 35 mph.

Some of the City's major roadways have both the highest volumes and posted speed limits, but do not have bicycle facilities. These include segments of Pacific Coast Highway and Beach Boulevard. 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 the more heavily trafficked route they are trying to avoid, provided such routes are available.

Figure 13: Speed Limits

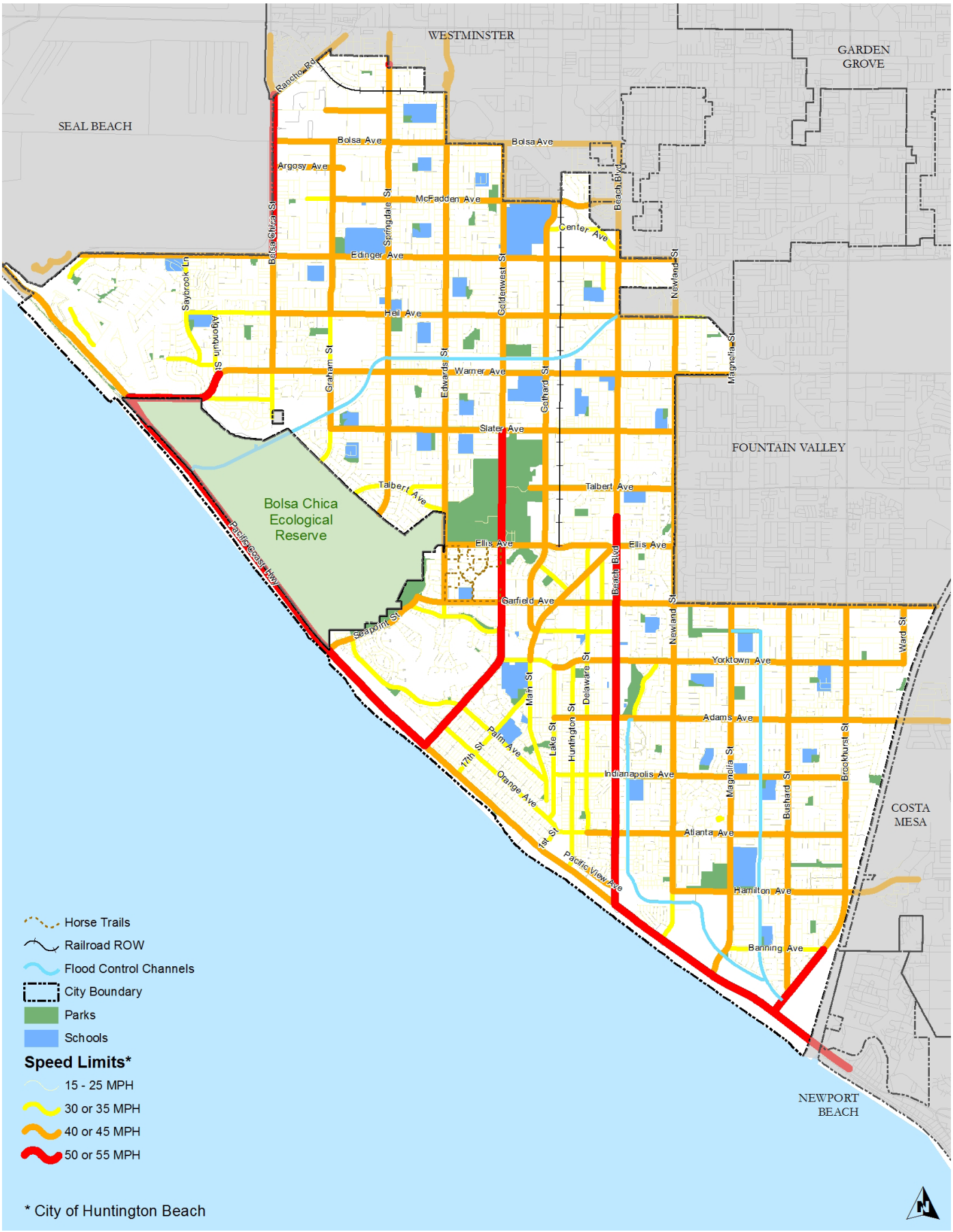
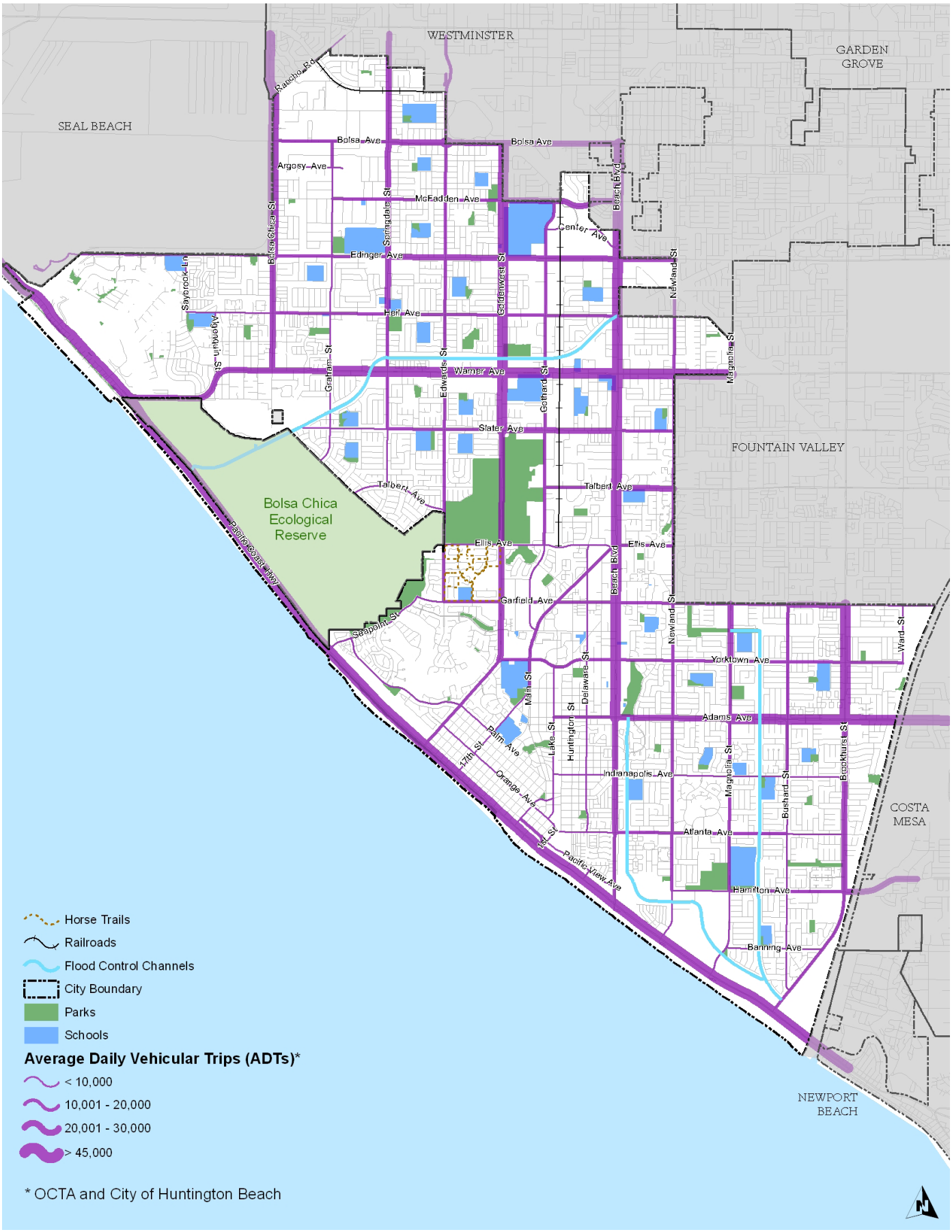


Figure 14: Average Daily Vehicular Trips (ADVTs)



2.6 Opportunities and Constraints Summary

Needs Assessment 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 are examined. 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 the needs of cyclists 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. As a result, it 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 fieldwork. These topics all relate to one another and help identify what is needed for a complete bikeway system. For example, safety concerns are 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.

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 to 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 fieldwork and consider for projects and then later to assist with ranking the implementation of projects. 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 15: Bicycle Demand Index displays the results of the model. For details on the inputs and methodology of the model, see Appendix B: Suitability Model and Project Prioritization.

Field Work

Following initial mapping and model development, field investigations mostly consisted of cycling around the City to get a "cyclist's perspective" of how the facilities function individually and as a whole. During the fieldwork, roadways were evaluated by asking the following questions: What condition are the facilities in? Do they meet standards? What aspects of the facilities feel unsafe? What are possible solutions?

Further field work conducted during the spring and summer of 2012 consisted of driving and then cycling to obtain first-hand experience. Most of the field work was conducted during the summer to fully understand peak use conditions. Follow-up field work involved examining specific areas about which community input had been received, as well as detailed analysis of sites for potential recommendations.

Community Input

Computer-generated maps and data cannot be relied upon by themselves. Local residents' input is critical to fact-checking fieldwork, model results and initial impressions. As a City of Huntington Beach planning effort, community involvement was instrumental in the analysis of existing conditions and formulation of recommendations for this study. Several techniques were employed to gather information and perceptions from as broad a range of perspectives as possible.

Bicycle Advisory Committee

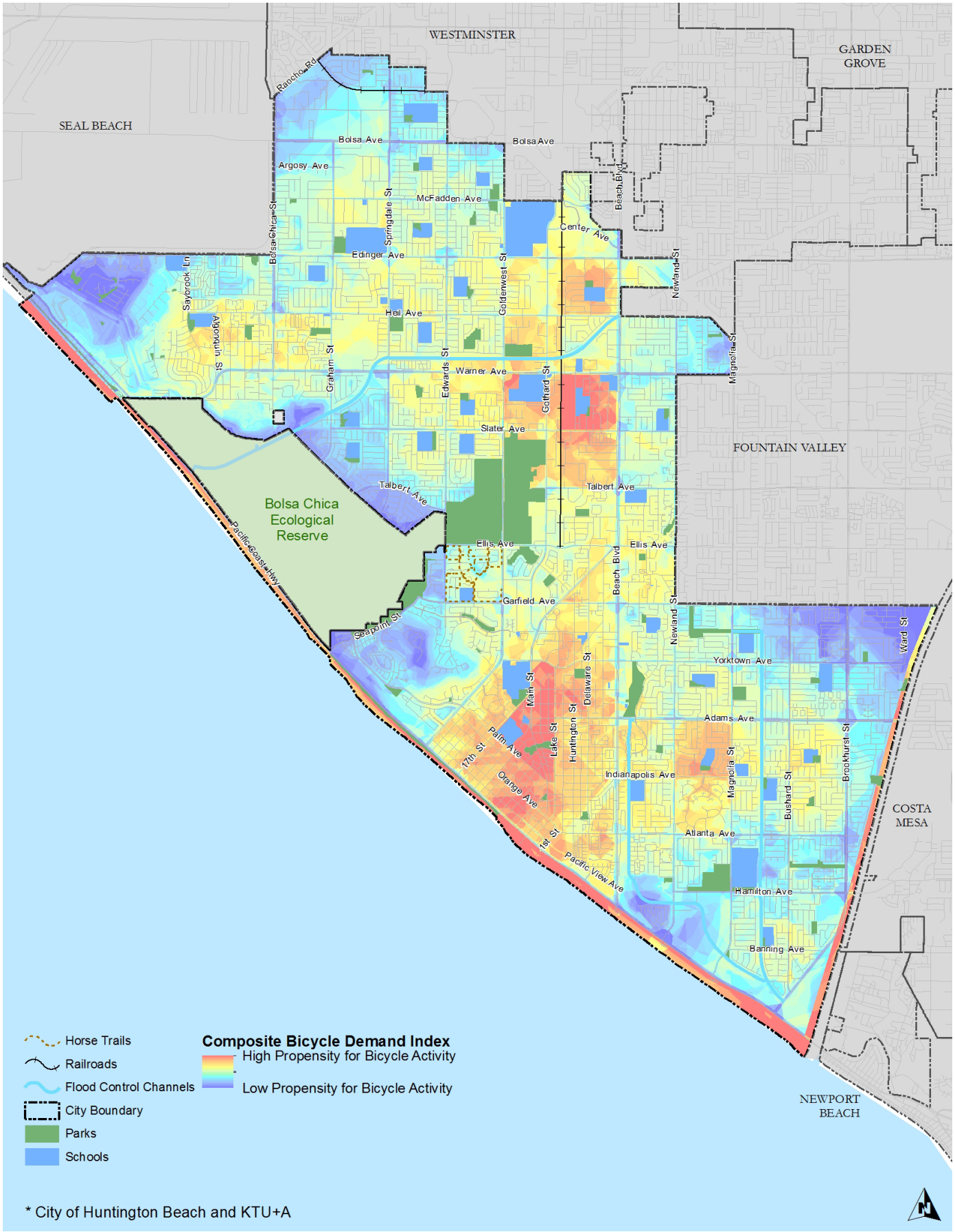
The City of Huntington Beach holds regular Bicycle Advisory Committee meetings to promote, coordinate and help carry out projects to make the City more bicycle-friendly. The committee members include Huntington Beach City Council members, City staff representatives from Public Works, Planning, Economic Development, Community Services and the Police Department, and bicycle advocates. Since its inception, it has been co-chaired by a City Council member and a bicycle advocate. Master plan consultants met with the BAC to take advantage of the group's familiarity and experience with Huntington Beach to review goals and objectives, suggest policies and actions and to review draft documents. The BAC was also instrumental in directing the study, providing guidance on appropriate analyses and in developing and prioritizing project and program recommendations.

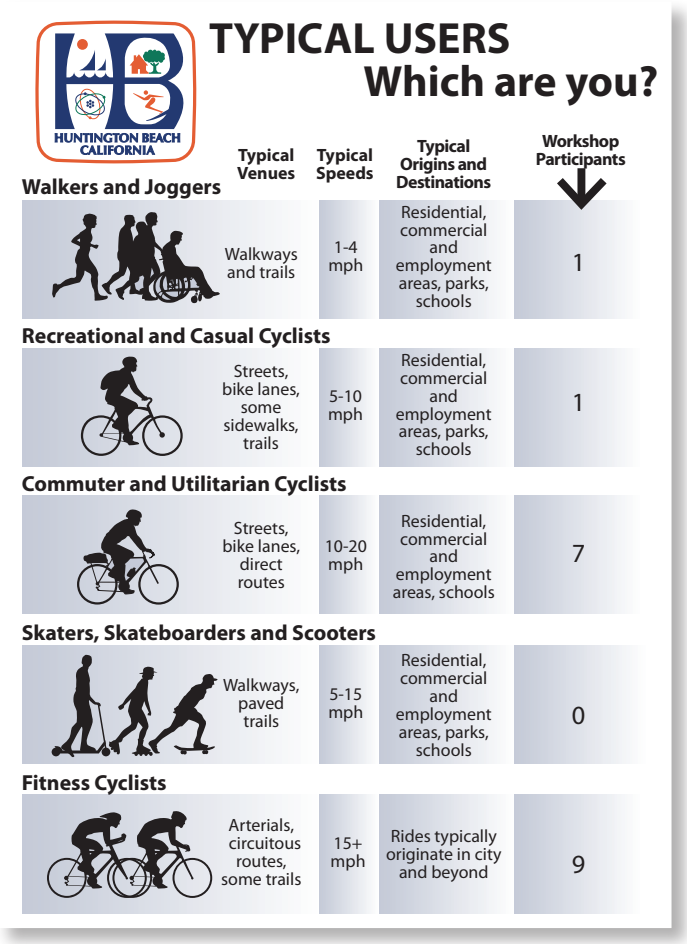
Community Workshops

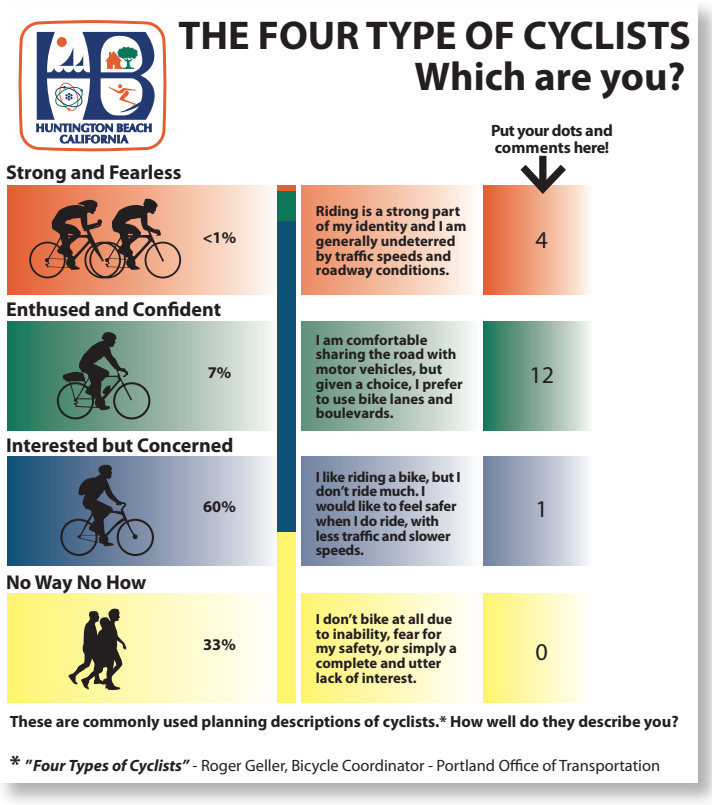
Two community workshops were held during the course of this master plan's development. At the first workshop, on 20 June 2012, large illustrative maps of existing conditions, along with depictions of potential facility types, were arranged around the room on easels to help educate participants about issues and potential solutions. In addition, high-resolution aerial plots of the entire City were placed on tables for participants to draw and write comments about their knowledge of the local cycling environment. This included where they currently did or did not ride and why, any existing facility gaps or other deficiencies, as well as where they would like to see additional facilities. There was also an instructional video shown throughout the workshop, the League of American Bicyclists' "*Essential Bicycling Skills*."

Discussion groups formed around the graphics and table maps resulting in substantial brainstorming and feedback. There were some suggestions about roadways missing facilities or reports of facilities that had been resurfaced and never repainted. However, the main message the KTU+A team received was that Huntington Beach is in need of an extensive outreach and education program. Meeting attendees stated that better cyclist and vehicle driver awareness (that they both share the same roads, have the same rights and responsibilities and must follow the same rules) were among their highest concerns or desires.

Figure 15: Bicycle Demand Index







These graphics are two boards used at the workshop to provide a snapshot of workshop attendees. Since they were a self-selecting population, both by attendance and by participating in this exercise, it is understood that the input may not reflect the opinions and preferences of the overall cyclist population. For this reason, while most attendees categorized themselves as "Enthused and Confident," the planning perspective used for this plan is the "8-80" concept intended to address bicycle facilities, programs and policies for users of all ages, including the "Interested but Concerned" group of cyclists noted on the board that make up an estimated 60 percent of the population.

The second workshop on April 11, 2013 focused on what was to be included in the draft plan, and to have participants help prioritize draft facility segments, suggested programs and policies.

Website and Online Survey

A study website was maintained through the draft phase of the project, on which meeting products and notices were posted. Probably its most important contribution to the project was its online survey. Such surveys have proved 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 what is generally provided at public meetings alone. To reach as broad a community constituency as possible, the survey was advertised via City events during the spring of 2012, such as at Surf City Nights and Orange County Transportation Authority's (OCTA) Bike Festival during Bike to Work Week, as well as through media and web outlets.

The survey was also distributed via email lists to those that had registered to hear more about the Bicycle Master Plan and to members of the Huntington Beach Bicycle Advocates (HuBBA). Workshop attendees were also informed about the survey, and fliers were distributed to area bicycle shops and other businesses. By November 2012, 143 people had completed the online survey. The flyer and survey response compilation can be found in Appendix C: Community Input.

Safety Analysis

The official causes of bicycle collisions are almost exclusively attributed to the behavior of either the cyclist or another roadway user (typically a vehicle driver). Both physical changes to the roadway and educational programs can have a corrective influence over the behavioral causes of bicycle collisions. The bicycle collision history presented earlier was considered when developing both infrastructure and programmatic recommendations.

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.

Bicycle Facility Criteria Analysis and Feasibility

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

- 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 paragraphs.

Class 1 Multi-use Paths

The typical width and horizontal clearance were measured using very high-resolution aerial photos provided by the City for segments where there appeared to be constraining factors. The minimum width for a Class 1 Bikeway 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.

It should be noted that California State Parks owns and operates approximately five miles of Class 1 paths within the study area, the majority of the local Class 1 system. Any proposed changes or additions should consider continuity and connection between the City and State Parks.

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.

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.

Recommendations 3

3.1 Recommended Projects

The recommended projects shown in this chapter 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.

Additional multi-use paths are primarily recommended along the flood control channels and railroad rights-of-way 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.

Class 2 Bicycle Lanes

Huntington Beach has enjoyed the benefit of having bicycle lanes already installed on many major arterials. Additional recommended bicycle lanes are primarily gap closures and traffic calming installations. The latter applies to some cases to very wide streets without bicycle facilities, and bicycle lanes are recommended to both perceptually narrow the streets to slow vehicular traffic, as well as providing a facility for cyclists.

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.

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. For example, the Utica Avenue bicycle boulevard provides direct access to Huntington Beach High School.

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.

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

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 16: Proposed Class 1 Multi-Use Pathways ("Bicycle Paths")

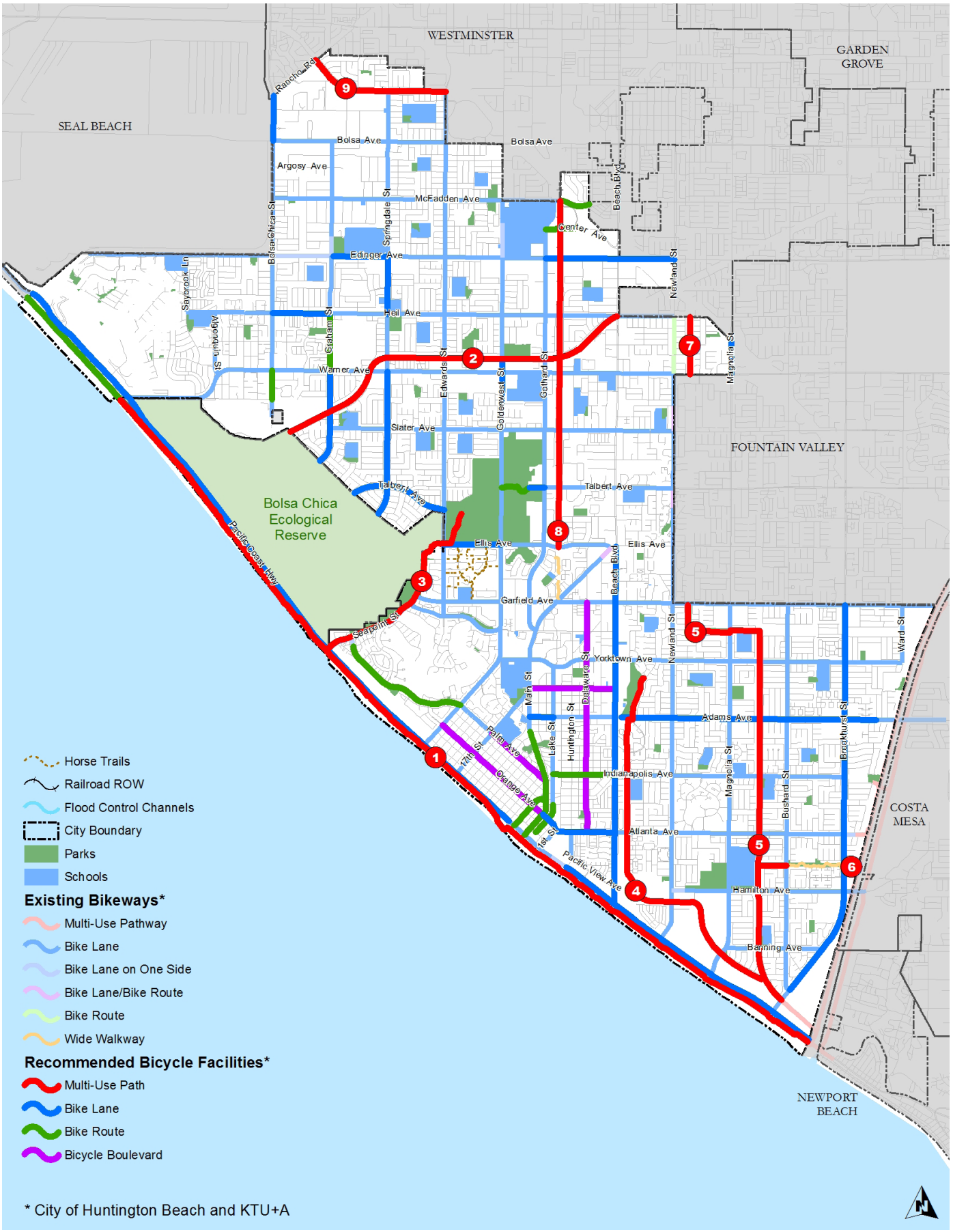


Table 9: Proposed Class 1 Multi-Use Paths

No.	Facility	From	To	Min Typ Width (ft)	Notes
1	**Huntington Beach Multi-use Beach Path**				
Existing multi-use path.		Seal Beach	Newport Beach	N/A	• Add center line stripe in select locations as safety measure • Widen beach path from current minimum 8' to 12' to better accommodate heavy weekend summertime use • Minimize landscape water overflow onto path to improve safety • Add additional berms adjacent to existing asphalt/wooden berms as needed to prevent sand from encroaching onto path • Widen constricted turns on path (Wider turn may increase some wheeled users' speeds) • Install stairway next to ADA ramp at intersection of Seapoint and beach path to minimize steep trail use - source of heavy erosion of sand onto path • Stencil "Yield" signs in lieu of "Stop" where appropriate at select path intersections • Path within state beaches owned and maintained by State Parks. Improvements require coordination with California State Parks system
2	**East Garden Grove - Westminster Channel**				
Multi-use path feasible using existing graded areas along top of each levy and access ramps for each side at roadway crossings.		Heil Avenue	Pacific Coast Highway	16	• At-grade crossings at Heil, Gothard, Goldenwest, Edwards, Springdale, Warner and Graham • Railroad crossing east of Gothard on north side would provide access to more open spaces and would not require bridge east of rail crossing • County plans to install bikeway between Slater and end of channel (Planned facility in GP but not in circulation update) • East side of channel already observed to be used by cyclists/pedestrians (Fence between channel and dog park north of ecological preserve has been cut to allow access) • Some roadway overcrossings (e.g. Graham) have vertical curvature that reduce sight distance and may impede drivers' view of crossing cyclists/pedestrians • California Department of Fish and Wildlife does not allow cycling. Cyclists required to walk their bicycles.

No.	Facility	From	To	Min Typ Width (ft)	Notes
3	**Seapoint Street Multi-use Path**				
Bikeway feasible.		Huntington Central/West Park	Garfield Avenue	N/A	• Open space bikeway alignment • At-grade crossing needed at Edwards • Mix of oil production and a power substation in this area • Graded trails currently exist and are in use • Overlook Drive provides trails and parking access
		Garfield Avenue	Palm Avenue	21	• Buffered bicycle lane in place along west side of Seapoint, as well as open space to west • Measured width is existing side-walk plus bicycle lane and buffer • Bikeway could be constructed in open space or by using space occupied by bicycle lanes/ sidewalk
		Palm Avenue	Pacific Coast Highway	21	• Buffered bicycle lanes in place • Measured width is existing sidewalk plus bicycle lanes and buffer • Open space not available • Riders could be directed to use existing Class 2 lanes in this segment
4	**Huntington Beach Channel**				
Multi-use path feasible using existing graded paths along the top of each levy and access ramps for each side at roadway crossings.		Bartlett Park	Talbert Channel	16	• Begins in Bartlett Park along Coldwater Lane. • Convert Coldwater Lane to Class 3 bicycle route when Barlett Park segment is built to access controlled intersection at Yorktown Avenue • At-grade crossings needed at Seabridge, Indianapolis, Atlanta, Newland and Magnolia • Graded path on west/south side ends at wet-lands/Magnolia Marsh • Existing bridge could carry bikeway users to north side and north side path could share new bridge with Talbert Channel Bikeway.
5	**Talbert Channel**				
Multi-use path feasible using existing graded areas along top of each levy and access ramps for each side at roadway crossings.		Hyde Park Drive	Brookhurst Street	16	• At-grade crossings needed at Yorktown, Adams, Indianapo-lis, Atlanta, Hamilton and Banning • West side accesses more public areas/schools • Bridge would be required to cross channel to east side at intersection with Huntington Beach Channel.
6	**Edison Greenway**				
Multi-use path feasible.		Santa Ana River Trail	Talbert Channel	N/A	• Open space, portion currently used as nursery • At-grade crossings at Brookhurst and Bushard • Existing pathway in Greenway would need to be widened in some segments to meet multi-use path standards

No.	Facility	From	To	Min Typ Width (ft)	Notes
7	**Edison Greenway**				
Multi-use path feasible.		City limit	City limit	N/A	• Open space, currently in use as nursery • Coordination needed with Edison, Fountain Valley and Westminster for path continuation
8	**UPRR Rail ROW**				
Multi-use path not feasible with current spacing (width measured from center of track to fence or other physical barrier). Multi-use path would have to cross active track multiple times. Recommend keeping project in long-range plan should rail go inactive.		McFadden Avenue	Edinger Avenue	West: 15/ East: 22	
		Edinger Avenue	Heil Avenue	West: 12/ East: 25	• Trapezoidal drainage channel on east side
		Heil Avenue	1300' s/o Talbert Avenue	West: 17/ East: 18	• Sidetrack between Warner and Slater, further reducing clearance
		1,300' s/o Talbert	Ellis Avenue	45	• Track removed in this segment
9	**US Navy ROW**				
Multi-use path feasible.		City limit	City limit	N/A	• Coordination needed with US Navy and Westminster for path continuation

Figure 17: Proposed Class 2 Bicycle Lanes

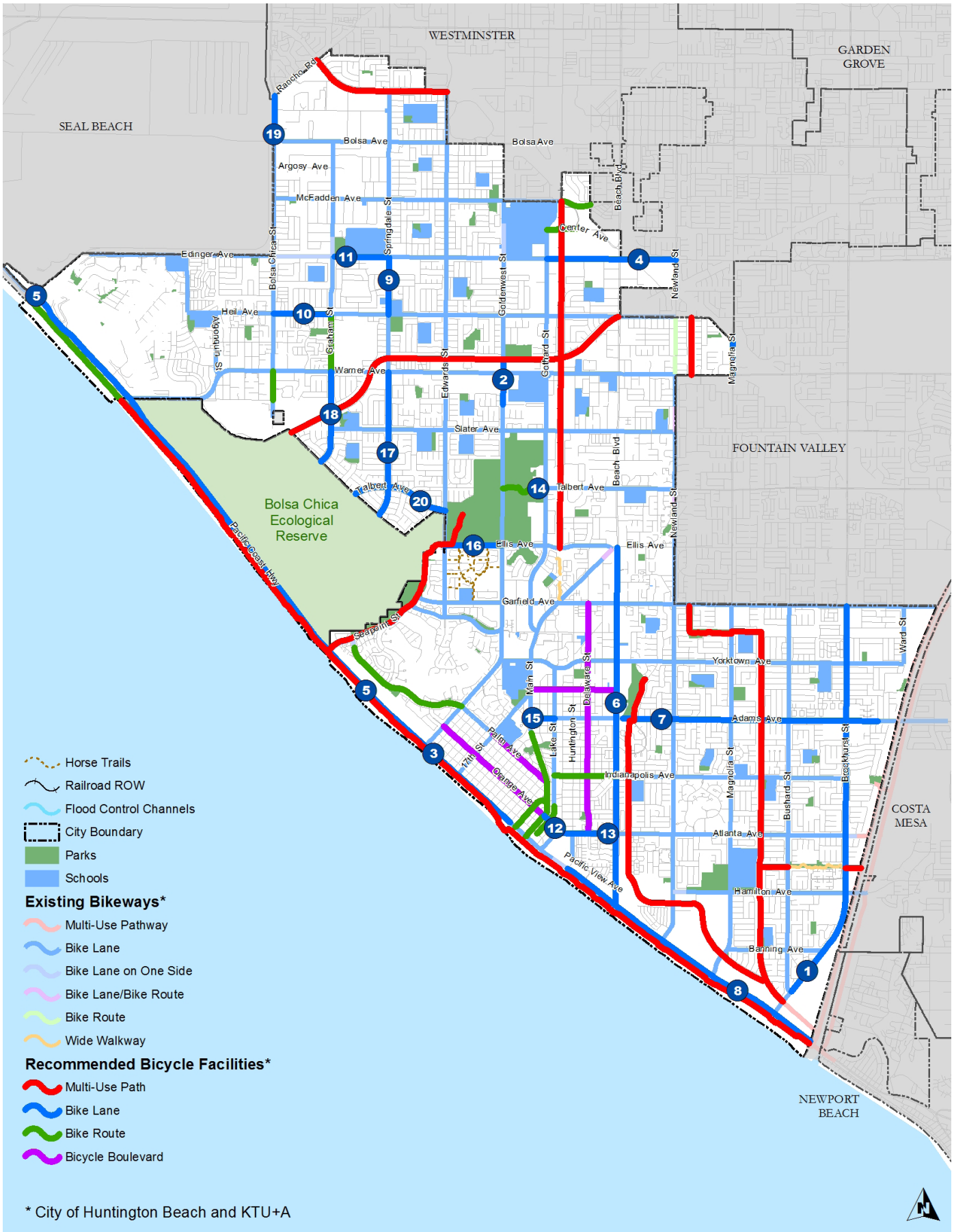


Table 10: Proposed Class 2 Bicycle Lanes

No.	Facility	From	To	Required Width (ft)	Existing Width (ft)	Delta	Notes
1	**Brookhurst Avenue**						
Bicycle lanes feasible.		Talbert Avenue	Yorktown Avenue	97	94	-3	Bicycle lane would terminate at southbound and northbound right turn lanes onto Talbert, Garfield, Ellis and Yorktown Avenues
		Yorktown Avenue	Adams Avenue	92	94	2	Bicycle lane would terminate at southbound right turn lane
		Adams Avenue	Atlanta Ave	88	94	6	Bicycle lane would terminate at southbound right turn lane
		Atlanta Avenue	Hamilton Avenue	90	100	10	Bicycle lane would terminate at southbound right turn lane
		Hamilton Avenue	Banning Avenue	104	104	0	Bicycle lane would terminate at northbound right turn lane
		Banning Avenue	Bushard Street	104	104	0	Bicycle lane would terminate at southbound right turn lane
2	**Goldenwest Street**						
Bicycle lanes not currently feasible. Lacks pavement width approaching Warner. Traffic volumes and connections make this an important route. Further study needed to accommodate bicycle lanes. Road diet an option.		Flood Channel	440' n/o Warner Ave	84	85	1	Bicycle lanes exist in both directions
		440' n/o Warner	Warner Ave	94	84	-10	5 southbound movements
		Warner Ave	250' s/o Warner Ave	104	91	-13	6 northbound movements
		250' s/o Warner Avenue	Betty Drive	90	82	-8	
3	**Pacific Coast Highway (7th to Goldenwest Street)**						
Bicycle lanes feasible with on-street parking or outside lanes narrowed. Reduced lane widths would require Caltrans design exception.		7th Street	Goldenwest Street	78	83	4	• Class 1 bikeway on ocean side • Class 2 route intended to accommodate cyclists who prefer separation from other users such as pedestrians • Caltrans standards call for 6' bicycle lanes where posted speed exceeds 40 mph
4	**Edinger Avenue**						
Bicycle lanes not currently feasible. Further study needed.		Gothard Street	200' e/o Fortuna Lane	88	82	- 6	Road diet from six to four lanes would be needed to accommodate bicycle lanes - Additional study needed prior to implementation
		200' e/o Fortuna Lane	Bella Terra	98	92	- 6	
		Bella Terra	Beach Blvd	98	92	- 6	

No.	Facility	From	To	Required Width (ft)	Existing Width (ft)	Delta	Notes
5	**Pacific Coast Highway (Goldenwest Street to City Limit)**						
Bicycle lanes would be feasible in most locations, with adequate space within striped shoulders.		Goldenwest Street	Bolsa Chica Ecological Reserve	66	80	14	• Striped 6-8' shoulder • Cyclists were observed riding on shoulders
		Bolsa Chica Ecological Reserve	650' west of Reserve	60	76.5	16.5	Striped 6-8' shoulder
		650' west of Reserve	2,440' w/o Reserve	60	76	16	Striped 6-8' shoulder
		2,440' w/o Reserve	Warner Drive	62	76	14	Striped 6-8' shoulder
		Warner Drive	City limit	76	80	4	Striped 6-8' shoulder on east side
6	**Beach Boulevard**						
Bicycle lanes feasible south of Main Street. Classified as a Smart Street within OCTA Master Plan of Arterial Highways. May be ineligible for M2 funds if downgraded from a Smart Street.		Main Street/ Ellis Avenue	Graziadio Drive	92	108	16	Bus pad ends at north end of segment, widens to 114', loses one lane in each direction
		Graziadio Drive	Adams Avenue	104	110	6	Some areas where parking unlikely, but no signs/striping it
		Adams Ave	Knoxville Avenue	98	110	12	At least one side of street has restricted parking
		Knoxville Avenue	Pacific Coast Highway	104	110	6	Some areas where parking unlikely, but no restricting signs/ striping

"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*

No.	Facility	From	To	Required Width (ft)	Existing Width (ft)	Delta	Notes
7	Adams Avenue						
Bicycle lanes feasible except for vicinity of intersection with Brookhurst.		Beach Boulevard	Slater 50/50 dwy entrance	88	98	10	Bicycle lane already striped westbound
		Slater 50/50 dwy entrance	Newland Street	88	102	14	
		Newland Street	Magnolia	88	98	10	Striped bicycle lanes exist in both directions
		Magnolia	Bushard	88	95	7	
		Bushard	500' w/o Brookhurst Street	88	98	10	Bicycle lane would terminate where dedicated right turn lanes begin
		500' w/o Brookhurst Street	Brookhurst Street	108	102	-6	Widens to two lanes with double left and eastbound right turn lane
		Brookhurst Street	495' e/o Brookhurst Street	106	96	-10	
		495' e/o Brookhurst Street	Ranger Lane	88	81	-7	
		Ranger Lane	Santa Ana River Trail	84	84	0	Striped bicycle lane exists in both directions but decreasing median width approaching river

"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*

No.	Facility	From	To	Required Width (ft)	Existing Width (ft)	Delta	Notes
8	**Pacific Coast Highway (Huntington Street to City Limit)**						
Bicycle lanes feasible in most locations with adequate space within striped shoulders.		Huntington Street	Just n/o Beach Boulevard	78	83	5	
		Just n/o Beach Boulevard	Beach Boulevard	99	100	1	• Cyclists observed using painted median between right and through movements for intersection storage
		Beach Boulevard	950' s/o Beach Boulevard	90	108	18	• Striped 8' shoulder • Roadway width measured EOP to EOP
		950' s/o Beach Boulevard	920' n/o Newland Street	85	104	19	• Striped 8' shoulder • Roadway width measured EOP to EOP • Some sand along west side
		920' n/o Newland Street	650' n/o Newland Street	96	108	12	• Limited space and no shoulder along northbound right turn lane • Width check on northbound shows 48' for 4 lanes, adequate for bicycle lane, but Caltrans may require full 12' lanes on Highway 1
		650' n/o Newland Street	430' n/o Newland Street	84	107	23	• Striped 8' shoulder • Roadway width measured edge-to-edge • Some sand along west side
		430' n/o Newland Street	Newland Street	92	107	15	• Width check northbound shows 48' for 4 lanes, adequate for bicycle lane, but Caltrans may require full 12' lanes on Highway 1
		Newland Street	405' s/o Newland Street	92	110	18	• Northbound right turn lane limits space for bicycle lane • Width check shows 48' for 4 lanes, adequate for bicycle lane, but Caltrans may require 12' lanes on PCH
		405' s/o Newland Street	City limit	79	96	17	• Striped 8' shoulder (min.) • Roadway width measured EOP to EOP • Some sand along west side • Narrow median with barrier

EOP - Edge of Pavement

No.	Facility	From	To	Required Width (ft)	Existing Width (ft)	Delta	Notes
9	Springdale Street						
Bicycle lanes feasible.		Edinger Avenue	Meadowlark Drive	70	78	8	• Red curb sections exist both sides north of Meadowlark • Existing on-street parking elsewhere
		Meadowlark Drive	Heil Avenue	76	78	2	• Red curb on both sides near churches • On-street parking
10	Heil Avenue						
Full bicycle lanes may not be feasible for entire segment.		Bolsa Chica Street	Regina Circle	64	63	-1	Striped bicycle lane in both directions
		Regina Circle	268' w/o Del Mar Lane	70	63	-7	Shared parking/bicycle lane (13') westbound, no facilities eastbound
		268' w/o Del Mar Lane	Del Mar Lane	70	69	-1	Shared parking/bicycle lane (13') westbound, no facilities eastbound
		Del Mar Lane	270' east of Del Mar Lane	68	68	0	• Parking and bicycle lane striped westbound • Bicycle lane only striped eastbound
		270' east of Del Mar Lane	Graham Place	58	63	5	• Parking and bicycle lane striped westbound • Bicycle lane striped east-bound
		Graham Place	Graham Street		62		Striped bicycle lanes exists in both directions
11	Edinger Avenue						
Bicycle lanes not feasible in segments with street parking.		Graham Street	300' e/o Club-house Lane	70	67	-3	Road diet from four lanes to two needed to accommodate bicycle lanes or remove on-street parking - Further study needed
		300' e/o Clubhouse Lane	Springdale Street	64	67	3	

No.	Facility	From	To	Required Width (ft)	Existing Width (ft)	Delta	Notes
12	**Orange Avenue**						
Bicycle lanes feasible.		Main Street	N/o 2nd Street	46	50	4	Bus stops southbound and northbound at Main
		N/o 2nd Street	2nd Street	40	58	18	
		2nd Street	N/o 1st Street	50	73	23	
		N/o 1st Street	1st Street	50	73	23	
13	**Atlanta Avenue**						
Bicycle lanes feasible.		First Street	Huntington Street	70	70	0	• Marked eastbound bicycle lane at intersection • Median not centered, but both directions could support bicycle lanes • On-stree parking westbound
		Huntington Street	Delaware Street	44	44	0	44' at narrowest point
		Delaware Street	Beach Boulevard	76	84	8	Parking existing on west side of Beach Blvd
14	**Talbert Avenue**						
Bicycle lanes feasible.		Gothard Street	Talbert Avenue bulb near ball field	34	42	8	Red curb entire length of segment
15	**Adams Avenue**						
Bicycle lanes not feasible with parking maintained.		Main Street	Lake Street	46	40	-6	Additional turn lane striped at Lake Street
16	**Ellis Avenue**						
Bicycle lanes feasible with road diet.		Edwards Street	Goldenwest Street	54	46	-8	Two eastbound and one westbound lane exist west of Goldenwest
17	**Springdale Street**						
Bicycle lanes feasible.		Warner Avenue	Slater Avenue	76	82	6	
		Slater Avenue	Hamshire Drive	56	82	26	
		Hamshire Drive	Talbert Ave	56	82	26	"Stop Ahead" marking for two lanes southbound, but no lane striping observed.
		Talbert Avenue	City limit	56	82	26	Dead ends into Bolsa Chica Ecological Reserve

No.	Facility	From	To	Required Width (ft)	Existing Width (ft)	Delta	Notes
18	**Graham Street**						
Bicycle lanes feasible.		Warner Avenue	200' s/o Warner	60	63	3	Dedicated right and left turn lanes at Warner Avenue
		200' s/o Warner	100' s/o Kenilworth	46	62	16	
		100' s/o Kenilworth	Glenstone Drive	34	50	16	No bicycle lane exists, just edge line. Potential coastal issues with parking removal
		Glenstone Drive	City limit	46	62	16	
19	**Bolsa Chica Street**						
Bicycle lanes feasible.		City limit	Bolsa Ave	92	90	-2	Roadway width in transition for majority of segment
20	**Talbert Avenue**						
Bicycle lanes feasible.		City limit	Grimsby Drive	56	62	6	
		Grimsby Drive	200' w/o Varsity Drive	56	62	6	
		200' w/o Varsity Drive	Varsity Drive	60	62	2	Dedicated right turn lane for eastbound right
		Varsity Drive	200' e/o Fieldbury Lane	56	62	6	
		200' e/o Fieldbury Lane	Edward Street	46	46	0	Dedicated right turn lane for eastbound right

Figure 18: Proposed Class 3 Bicycle Routes

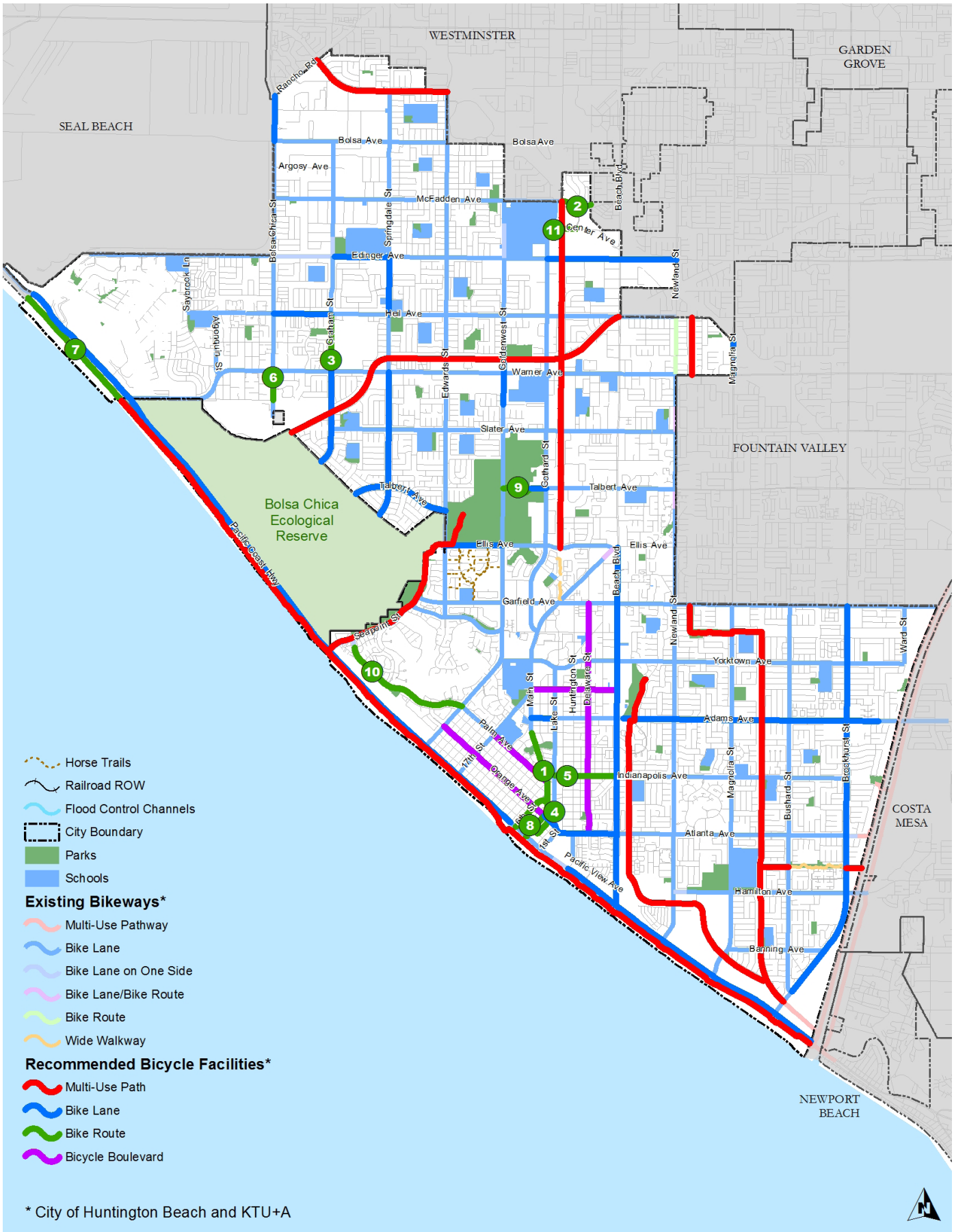


Table 11: Proposed Class 3 Bicycle Routes

No.	Facility	From	To	Required Width (ft) for CLASS 2 FACILITY	Existing Width (ft)	Delta	Notes
1	**Main Street**						
Class 3 feasible. Main Street adjacent to beach narrow but features extensive traffic calming. Recommend sharrows in this segment. Note: Existing width not measured from curb-to-curb because angled parking would not be accurately accounted for - Instead width between angled parking striping or curb to angled parking striping measured		13th Street	Palm Avenue	46	44	-2	
		Palm Avenue	Pecan Avenue/ Acacia	46	48	2	
		Pecan Avenue/ Acacia	Just s/o Acacia	34	24	-10	
		Just s/o Acacia	6th Street	56	48	-8	
		6th Street	Bulbout s/o 6th Street	44	34	-10	
		Bulbout s/o 6th Street	Pecan Avenue	46	46	0	Parallel parking northbound, angled parking southbound
		Pecan Avenue	Bend in roadway	38	40	2	• Angled parking both sides
		Bend in roadway	PCH	40	24	-16	• Northbound angled parking • Parallel parking along southbound segment, not included in width • Many breaks in parking, as well as "no parking" zones
2	**McFadden Avenue**						
Class 3 feasible. Recommend Sharrows in this segment. Note: Long-range plan to replace bridge as part of I-405 widening project.		UPRR Rail	Just e/o Huntington Village	64	64	0	Roadway merges to two lanes just east of this point
		Just e/o Huntington Village	Freeway bridge	34	37	3	
		Freeway bridge	Sugar Avenue East	44	40	-4	
		Sugar Avenue East	Pacific Street	52	61	9	
		Pacific Street	Just e/o Pacific Street	56	64	8	

"Required Width (ft) for CLASS 2 FACILITY" *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.*

No.	Facility	From	To	Required Width (ft) for CLASS 2 FACILITY	Existing Width (ft)	Delta	Notes
3	**Graham Street**						
Class 3 feasible. Recommend sharrows in this segment.		Heil Avenue	Just s/o Fernhill Circle	50	43	-7	• Width measure from southbound striping to northbound curb • Southbound walkway unpaved
		Just s/o Fernhill Circle	North edge of Meadowlark Country Club	46	62	16	
		North boundary of Meadowlark Country Club	N/o Old Pirate Drive	40	42	2	• Width measure from southbound curb to northbound striping • Northbound sidewalk unpaved
		N/o Old Pirate Drive	Meadowlark Country Club parking entrance	34	25	-9	Width measured from southbound striping to northbound striping. Northbound and southbound sidewalk unpaved
		Meadowlark Country Club parking entrance	265' n/o Diamond Drive	40	38	-2	Northbound sidewalk unpaved
		265' n/o Diamond Drive	Diamond Drive	34	29	-5	Northbound sidewalk unpaved
		Diamond Drive	Warner Avenue	44	58	14	Northbound sidewalk unpaved
4	**Lake Street/3rd Street**						
Class 3 feasible. Recommend sharrows in this segment.		Walnut Ave	Lake Street south split	46	38	-8	
		Lake Street south split	Pecan Avenue	56	64	8	
5	**Indianapolis Avenue**						
Class 3 feasible. Recommend sharrows in this segment.		Lake Street	Georgia Street	46	40	-6	Approx 85' red curb westbound at Lake, remainder has parking
		Georgia Street	Beach Boulevard	50	50	0	

"Required Width (ft) for CLASS 2 FACILITY" *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.*

No.	Facility	From	To	Required Width (ft) for CLASS 2 FACILITY	Existing Width (ft)	Delta	Notes
6	**Bolsa Chica Street**						
Class 3 feasible. Recommend sharrows in this segment.		Warner Avenue	150' s/o Dunbar	50	44	-6	
		150' s/o Dunbar	Los Patos	50	100	50	Buffer striped northbound, included in existing width. Northbound parking not included in inventory
7	**North Pacific and South Pacific Avenues (Sunset Beach)**						
Class 3 feasible. Recommend sharrows in this segment.		Anderson Street	Warner Ave	34	28	-6	One-way street couplet with diagonal on-street parking, separated by median walkway and open space
8	**6th Street**						
Class 3 feasible. Recommend sharrows in this segment.		Main Street	Orange Avenue	58	50	-8	
		Orange Avenue	Pacific Coast Highway	46	54	8	
9	**Talbert Avenue**						
Class 3 feasible. Recommend sharrows in this segment.		Goldenwest Street	Goldenwest cul-de-sac	89	86	-3	Library driveway entrance
		Goldenwest cul-de-sac	Just east of Goldenwest cul-de-sac	34	30	-4	Sharrows and appropriate signage recommended to demarcate route through library parking area
		Just east of Goldenwest cul-de-sac	Talbert Avenue	34	35	1	

"Required Width (ft) for CLASS 2 FACILITY" *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.*

No.	Facility	From	To	Required Width (ft) for CLASS 2 FACILITY	Existing Width (ft)	Delta	Notes
10	**Palm Avenue**						
Class 3 feasible. Recommend sharrows in this segment.		Camelback Drive	End of buffer striping 578' s/o Camelback Drive	70	80	10	Red curbed and northbound buffer striping s/o Camelback ~578'
		End of buffer striping 578' s/o Camelback Drive	Just n/o Cherryhill Drive	68	63	-5	
		Just n/o Cherryhill Drive	Cherryhill Drive intersection	71	80	9	Raised median and left turn pocket = raised median width
		Cherryhill Drive intersection	Just n/o Goldenwest	83	80	-3	On-street parking present on some segments on both sides
		Just n/o Goldenwest	Goldenwest	75	81	6	Raised median and left turn pocket = raised median width
11	**Center Avenue**						
Class 3 feasible. Recommend sharrows in this segment.		Huntington Village Lane	Gothard Avenue	64	57	-7	

"Required Width (ft) for CLASS 2 FACILITY" *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 19: Proposed Bicycle Boulevards

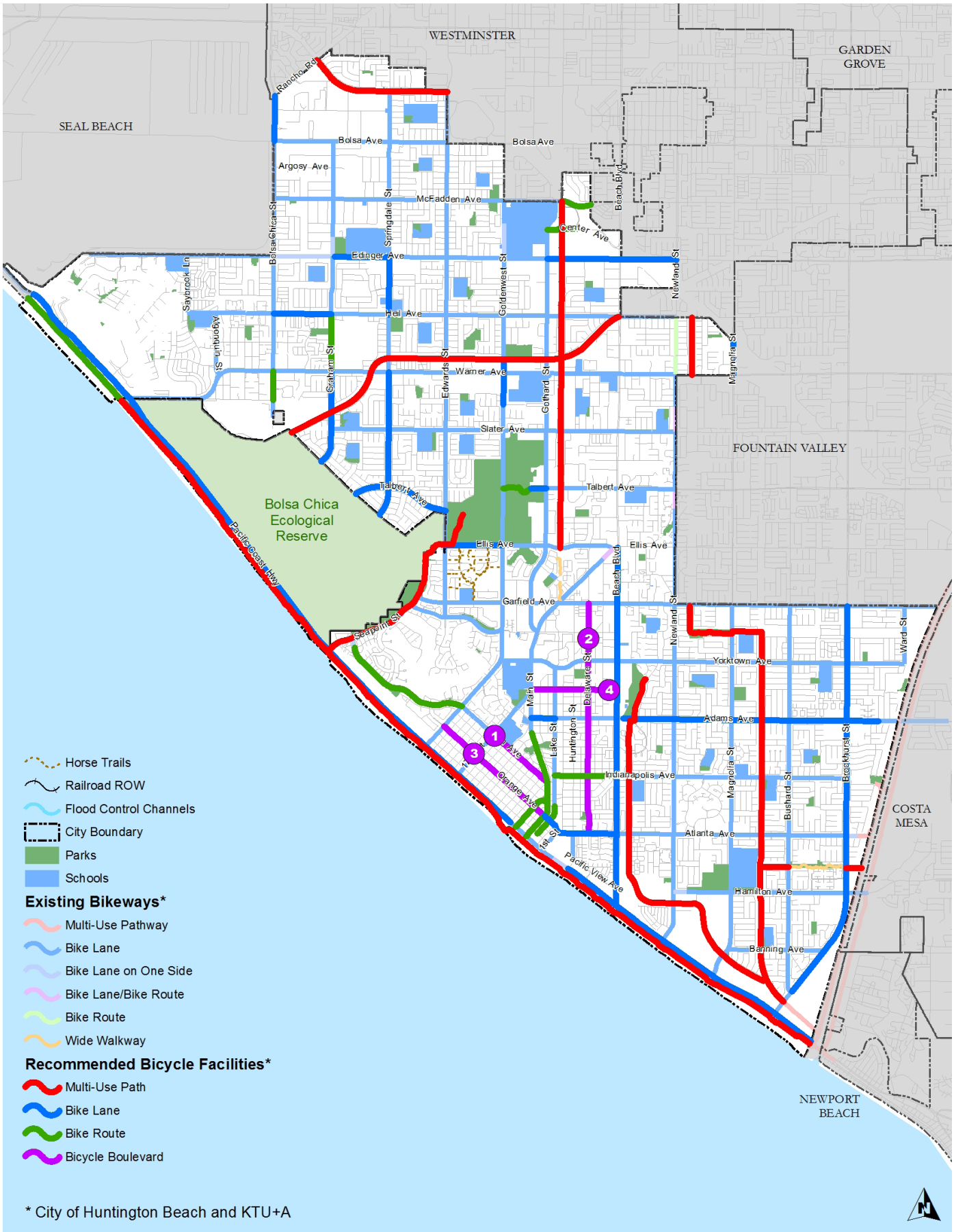
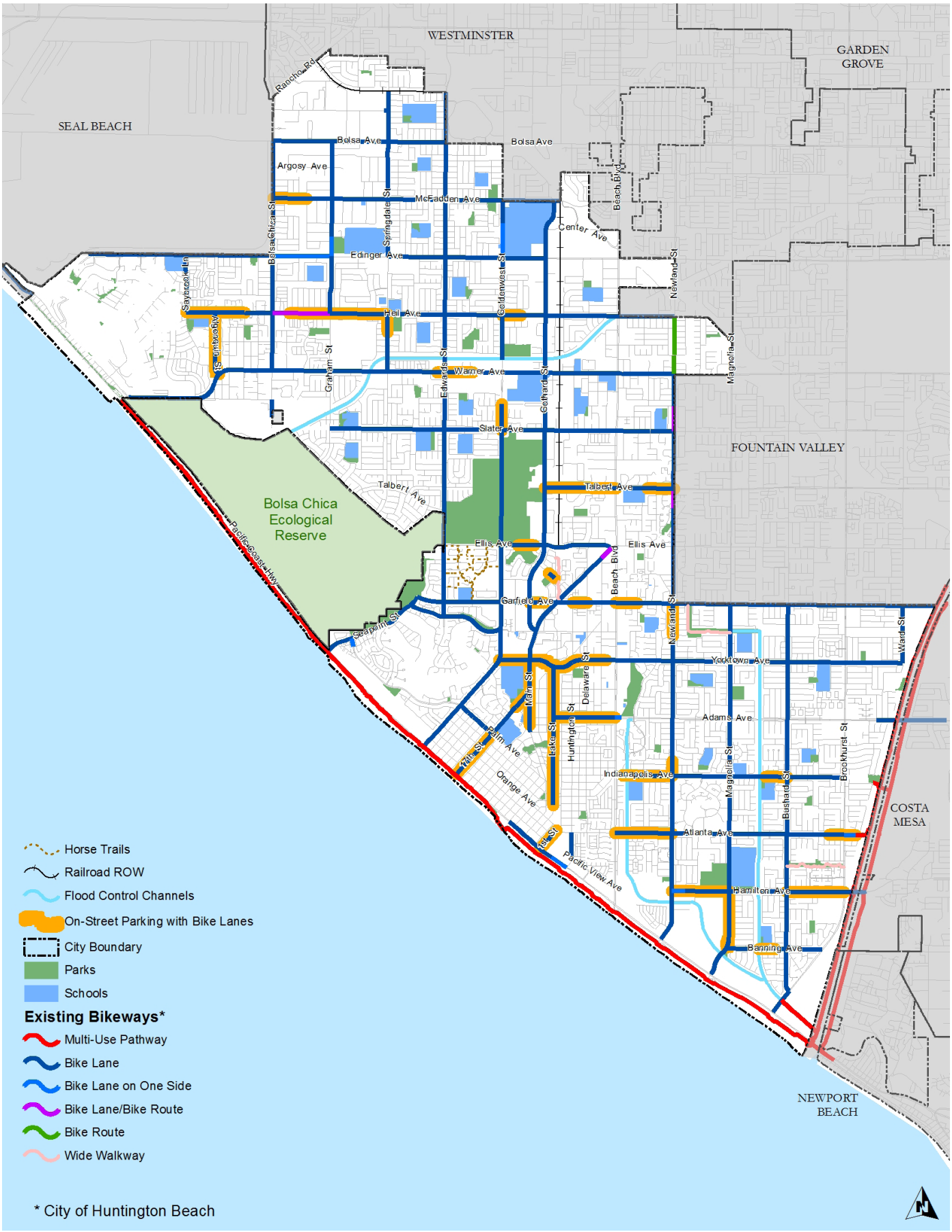


Table 12: Proposed Bicycle Boulevards

No.	Facility	Between... (N/W)	... and (S/E)	Existing Width (ft.)	Intersections	Traffic Control	Notes
1	**Palm Avenue**						
Bike boulevard feasible. (Bike boulevard components can include sharrows, roundabouts and diverters. Detailed study and design required.)		17th Street	Main Street	40	9	AWS at 11th and 14th Street	• Garage access alleys open onto Palm • On-street parking typically present
2	**Delaware Street**						
Bike Boulevard feasible. (Bike boulevard components can include sharrows, roundabouts and diverters. Detailed study and design required.)		Atlanta Avenue	Frankfort Avenue	64	5	AWS at Atlanta and Frankfort.	• On-street parking typically present • Other intersections are SSSC
		Frankfort Avenue	Memphis Avenue	52	10	AWS at Frankfort, Indianapolis and Memphis.	• On-street parking typically present • Other intersections are SSSC
		Memphis Avenue	Yorktown Avenue	62	11	AWS at Adams, Memphis, Utica and Yorktown.	• Center turn lanes present • On-street parking typically present • Other intersections are SSSC
		Yorktown Avenue	Garfield Avenue	64	5	AWS at Adams, Yorktown, 17th and Garfield	• On-street parking typically present • Other intersections are SSSC
3	**Orange Avenue**						
Bike Boulevard feasible. (Bike boulevard components can include sharrows, roundabouts and diverters. Detailed study and design required.)		Goldenwest Street	17th Street	48	7	AWS at Goldenwest and 17th St.	• On-street parking typically present • Other intersections are SSSC
		17th Street	Main Street	50	13	AWS at 17th, 6th, 9th, 10th, 11th, and 14th.	• On-street parking typically present • Other intersections are SSSC
4	**Utica Avenue**						
Bike boulevard feasible. (Bike boulevard components can include sharrows, roundabouts and diverters. Detailed study and design required.)		Main Street	Beach Boulevard	40	9	AWS at Lake, Huntington, Delaware and Florida	• Garage access alleys open onto Palm • On-street parking typically present • SSSC against Utica

AWS - All Way Stop
SSSC - Side Street Stopped Controlled

Figure 20: On-Street Parking adjacent to Bicycle Lanes



3.2 Improvements to Existing Facilities

"Door Zone" Analysis

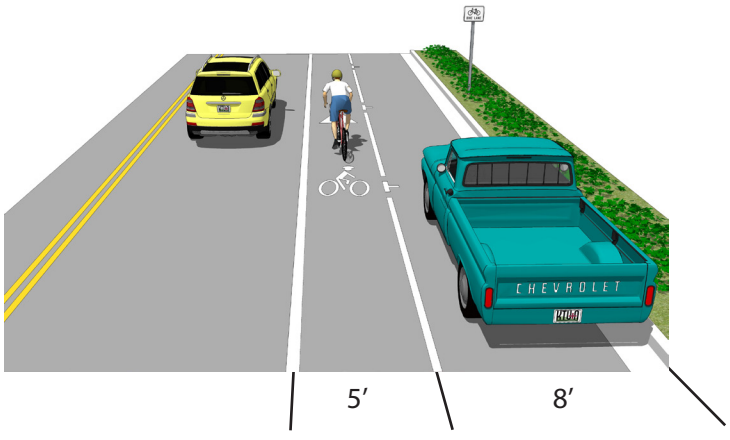
The majority of the bicycle lanes within the City are adjacent to curbs and fulfill CA MUTCD bicycle lane width recommendations, but may not meet cyclists' real safety needs. The table on the following pages lists bicycle lanes adjacent to on-street parking to identify any deficiencies. All but four segments meet the recommendations of five foot bicycle lanes (where parking is permitted) and an eight foot parking stall. Some segments of Hamilton, Yorktown, Garfield and Heil Avenues have sections below the standard 13 foot width (five foot bicycle lane and eight foot parking lane). However, these dimensions may vary depending on the existing striping.

The minimum width found was 12 feet, which corresponds to a four foot bicycle lane, which does not meet CA MUTCD recommendations of five feet adjacent to on-street parking. Bicycle lane width will vary if there is no striping separating it from the parking lane, and vehicles are parked at variable distances from the curb, making the functional lane dependent on the size and location of the parked vehicles. This type of striping is the most common in the City.

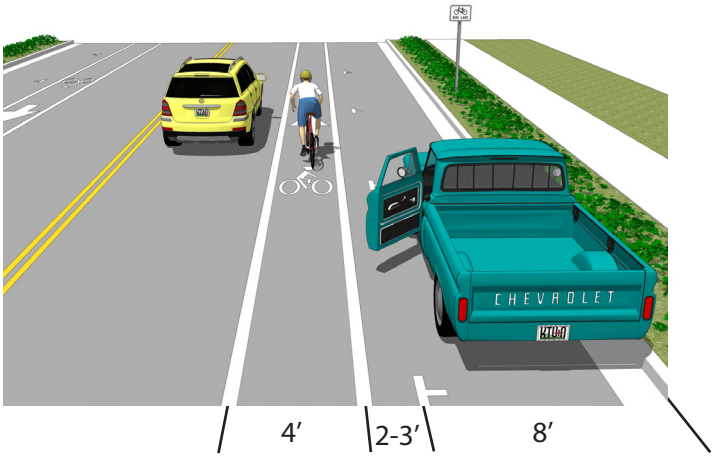
At a minimum, the on-street parking adjacent to a bicycle lane should have parking space markings. Delineation of the parking space can be either an outside bicycle lane line or T-shaped parking space markings, or a combination of the two. This provides guidance for vehicle drivers to park within the designated space and to limit encroachment into the bicycle lane.

Additionally, during any road resurfacing on streets where the bicycle lane and adjacent on-street parking do not quite meet the minimum width requirements, the bicycle lanes should be re-striped to a minimum of five feet and parking stalls to eight feet for a total of 13 feet. Whenever possible, a six foot bicycle lane is recommended to provide additional separation between parked vehicles and cyclists. Especially where parking turnover is high, it is also recommended that a buffer line be painted two feet out from the parking stall Ts to further perceptually separate the resulting four foot bicycle lane and the on-street parking. This will reduce incidents of cyclists colliding with opening car doors and potentially being thrown into the travel lane.

Bicycle Lane Marking adjacent to On-Street Parking



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.

Table 13: Existing "Door Zone" Inventory				
Roadway	**Segment**	**Lane Direction**	**Total Lane Width (Feet)**	**Bicycle Lane/ Parking Separation**
McFadden Avenue	Bolsa Chica Street and Camby Lane	Westbound	14	No stripe
McFadden Avenue	Bolsa Chica Street and Camby Lane	Eastbound	13	No stripe
Heil Avenue	Saybrook and Caballero Lanes	Both	13	No stripe
Algonquin Street	Heil and Warner Avenues	Southbound	15	Bicycle lane stripe and No Stripe
Algonquin Street	Heil and Warner Avenues	Northbound	13	No stripe
Heil Avenue	Bolsa Chica and Springdale Street	Westbound	13	No stripe
Springdale Street	Heil Avenue and Midiron Circle (Adjacent to Carr Park)	Northbound	13	No stripe
Heil Avenue	Goldenwest Street and Flood channel	Eastbound	12	No stripe
Warner Avenue	Warner Avenue and Edwards Street	Eastbound	13	Bicycle lane stripe
Warner Avenue	St George Lane and Edwards Street	Westbound	13	Bicycle lane stripe
Warner Avenue	Edwards Street and Sculpin Lane	Both	14	Bicycle lane stripe
Goldenwest Street	Ford Drive and Betty Drive	Northbound	13	No stripe
Talbert Avenue	Gothard Street and Beach Boulevard	Both	13	No stripe
Talbert Avenue	Good Shepherd Cemetery and Newland Street	Both	13	No stripe
Ellis Avenue	Ashley Drive and Bentley Lane (Adjacent to Baca Park, parking turn-out present)	Eastbound	16	No stripe
Garfield Avenue	Huntington and Florida Streets	Westbound	13	Bicycle lane stripe
Garfield Avenue	Beach Boulevard and Colchester Lane	Westbound	12	No stripe
Newland Street	Milford Circle and Bridgeport Drive	Southbound	14	No stripe
Yorktown Avenue	Goldenwest and Main Streets	Eastbound	12	Bicycle lane stripe
Yorktown Avenue	Main and Lake Streets	Both	13	Parking Ts
Yorktown Avenue	Lake and Huntington Streets	Both	13	No stripe
Yorktown Avenue	Huntington and Delaware Streets	Westbound	14-18	No stripe
Yorktown Avenue	Delaware and Florida Streets	Both	13	Bicycle lane stripe
Main Street	Yorktown and Adams Avenues	Both	13	No stripe
Main Street	Adams and Loma Avenues	Northbound	13	No stripe
Lake Street	Park Street and Pecan Avenue	Both	13	No stripe

Table 13: Existing "Door Zone" Inventory				
Roadway	**Segment**	**Lane Direction**	**Total Lane Width (Feet)**	**Bicycle Lane/ Parking Separation**
Adams Avenue	Lake and Alabama Streets	Westbound	13	No stripe
Adams Avenue	Alabama and Florida Streets	Both	13	No stripe
Indianapolis Avenue	Huntington Beach Channel and Newland Street	Both	15	Bicycle lane stripe
Indianapolis Avenue	Titan Lane and Bushard Street	Westbound	13	Bicycle lane stripe
Newland Street	Vail Drive and Indianapolis Avenue	Southbound	13	No stripe
Atlanta Avenue	Huntington Beach Channel and Newland Street	Both	13	No stripe
Atlanta Avenue	Brookhurst Street and multi-use path connector	Westbound	14	Bicycle lane stripe
Hamilton Avenue	Surveyor Circle and Magnolia Street (Adjacent to Edison Park)	Westbound	12	No stripe
Hamilton Avenue	Bushard Street and Santa Ana River Trail	Both	12	Bicycle lane stripe
Magnolia Street	Bermuda Drive and Banning Avenue	Southbound	13	No stripe
1st Street	Walnut and Olive Avenues	Both	13	Parking Ts
17th Street	Pacific Coast Highway and Palm Avenue	Both	13	No stripe

Improvements to Other Existing Facilities

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

Multi-use Paths

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

Bicycle Lanes

Bicycle Detectors: Whenever repaving projects occur, or repairs on streets with bicycle lanes, install bicycle detector loops or signal actuators similar to those on Beach Boulevard and Gothard Street.

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

Warner Avenue: Widen westbound bicycle lanes to six feet between Algonquin Street and Bolsa Chica State Park. Cyclists can generate higher speeds on this downhill segment and a wider lane will allow more movement within the lane to avoid debris, etc. Signage to Bolsa Chica State Park and the beach are also recommended.

Bicycle Routes

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

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, such as downtown district, the Huntington Beach Pier, parks and shopping centers, increased bicycle parking is recommended. Increased bicycle parking provides an option for individuals who need to make a short trip to the local store to ride their bicycle rather than drive their car.

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

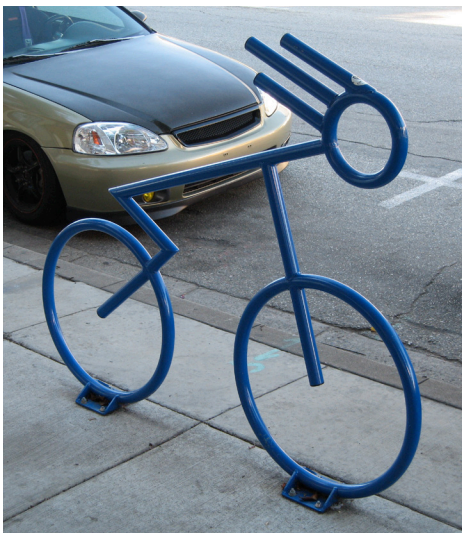
Bicycle rack type plays a major role in the utilization of the bicycle racks. Only racks that support the bicycle at two points and allow convenient locking should be used. Racks that can secure the entire bicycle are preferred and recommended for installation in commercial areas, schools, parks and 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, especially if they are historically themed, 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 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 both wheels
- Do not trip pedestrians
- Are easily accessed yet protected from motor vehicles
- Are covered where users will leave their bikes 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 both 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 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 car 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 downtown, 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.

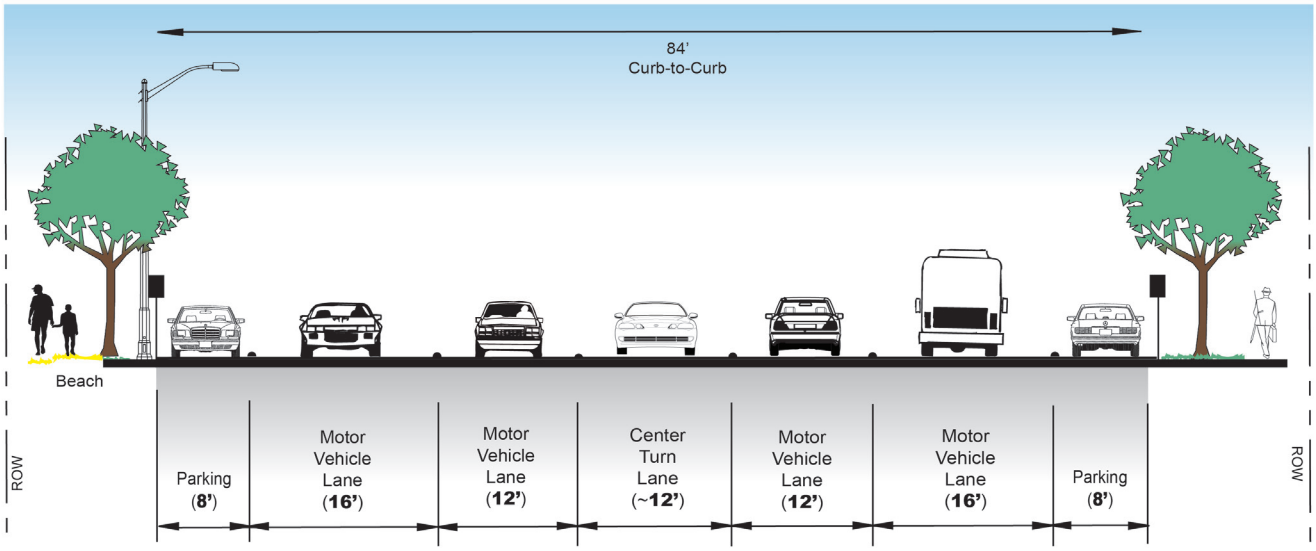
In terms of placement, it is desirable to put bicycle corrals near intersections. Mid-block placement is not recommended because the corral can be hidden by parked motor vehicles, reducing visibility for both vehicle drivers and cyclists. Bicycle corral racks can be customized and have been designed 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.

Pacific Coast Highway Alternatives

Existing Conditions

- **Right-Of-Way Width:** 84'
- **Horizontal Alignment:** 2x8' parking lanes, 2x ~16' outside travel lanes, 2x12' travel lane, 1x ~12' center turn lane

The following recommendations are based on the continuity of the proposed bicycle lanes between Goldenwest Avenue and 7th Street. This segment is primarily adjacent to commercial and residential land uses along the northbound lanes and Huntington State Beach on the southbound lanes. These alternatives allow cyclists to ride on Pacific Coast Highway and to avoid pedestrian conflicts on the adjacent Huntington Beach Multi-use Beach Path.



Existing Conditions - Cross Section

Alternative 1: Bicycle Lanes with Buffers (Parking removed on one side)

Proposed Horizontal Alignment

Parking: 1x8′
Bicycle Lane Buffers: 2x1.5′
Bicycle Lanes: 2x6′
Curb Side Travel Lane: 2x12′
Inside Travel Lanes: 2x12′
Center Turn Lane: 13′

Opportunities:

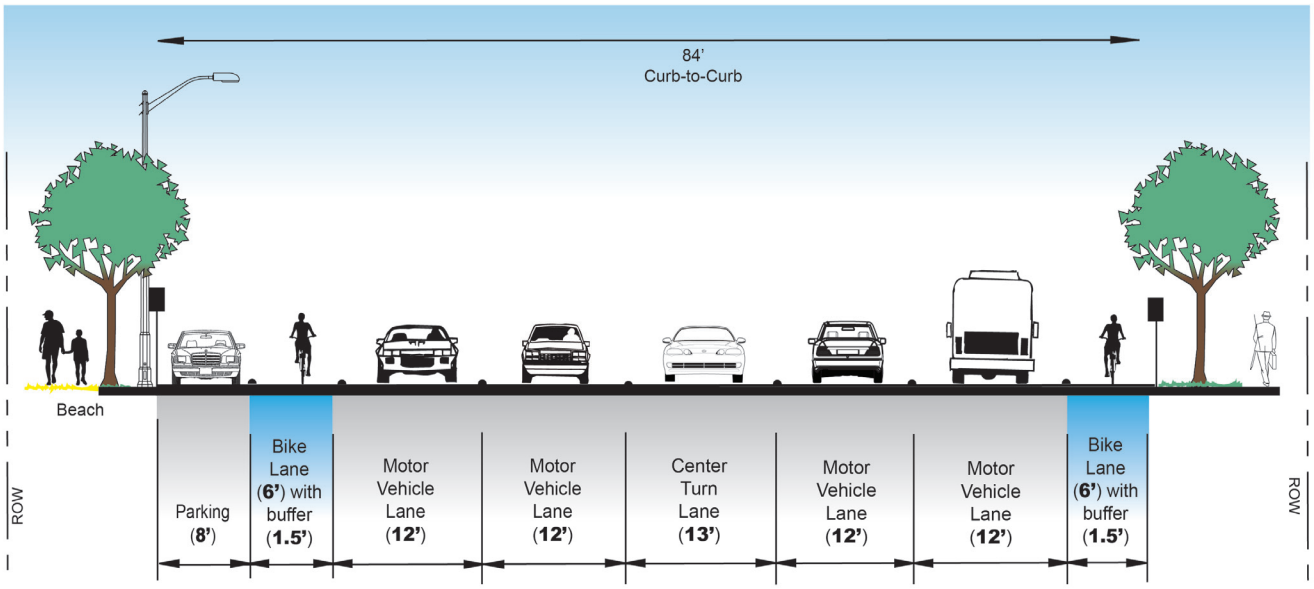
- Provides additional horizontal clearance from parked vehicles and reduces the chances of conflicts with open vehicle doors.
- Metered parking remains on southbound lanes to access beach.
- Exceeds CA MUTCD and *Highway Design Manual* standards.
- Provides additional clearance for larger weekend cycling groups. More than 50 percent of collisions on Pacific Coast Highway have occurred on weekends.

Constraints:

- Parking removed from northbound lanes.
- City Zoning and Subdivision Ordinance 231.28 - *If any existing oceanside or on-street parking within the coastal zone is removed, it shall be replaced on a one for one basis in an area that would not result in the loss of any sandy beach area and within walking distance of the existing site. Replacement parking shall be assured prior to the issuance of the coastal development permit and shall be provided before any existing parking is removed so that there will be no reduction in the number of parking spaces available.*
- Loss of revenue from removal of metered parking.
- Bus pads will encroach into bicycle lanes.
- Proposed configuration requires significant improvements beyond striping.
- Reconfiguration would require Caltrans approval.

Notes:

- Ordinance 231.28 would require revision or repeal for this alternative to be implemented without replacement parking.



Alternative 1 - Cross Section

Alternative 1 - Pacific Coast Highway (view northbound)

Alternative 2: One-Way Cycle Track and Bicycle Lane Hybrid

Proposed Horizontal Alignment

Parking: 2x8'
Cycle Track Buffers: 1x2'
One-Way Cycle Track Lanes: 1x5'
Bicycle Lanes: 1x6'
Curb Side Travel Lane: 2x11'
Inside Travel Lanes: 2x11'
Center Turn Lane: 11'

Opportunities:

- Provides a protected bicycle only cycle track southbound and standard bicycle lane northbound.
- Existing metered parking remains on both sides.
- Minimal driveway and intersection conflicts on southbound cycle track.

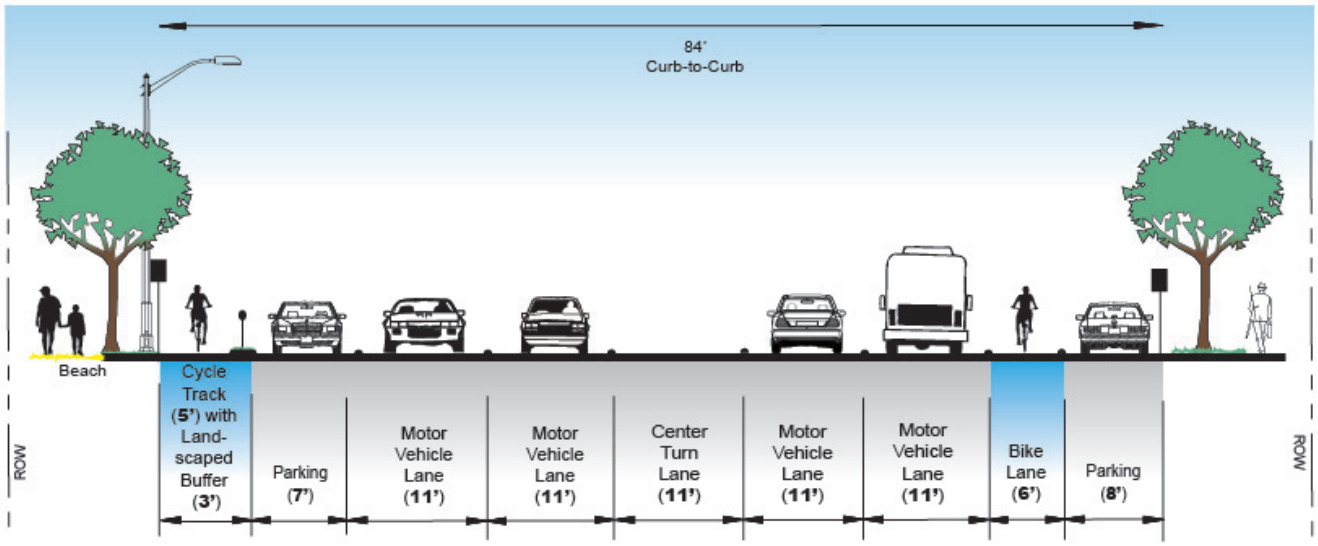
Constraints:

- Street sweeping maintenance.
- Pedestrian and bicycle conflict when crossing cycle track from parked vehicles.
- Bus pads will encroach into bicycle lanes.
- Reduction to 11' travel lanes would require Caltrans design exception and Caltrans Construction for Evaluated Program for Experimental Features approval.
- According to NACTO, three foot minimum is desired width for parking lane buffer.

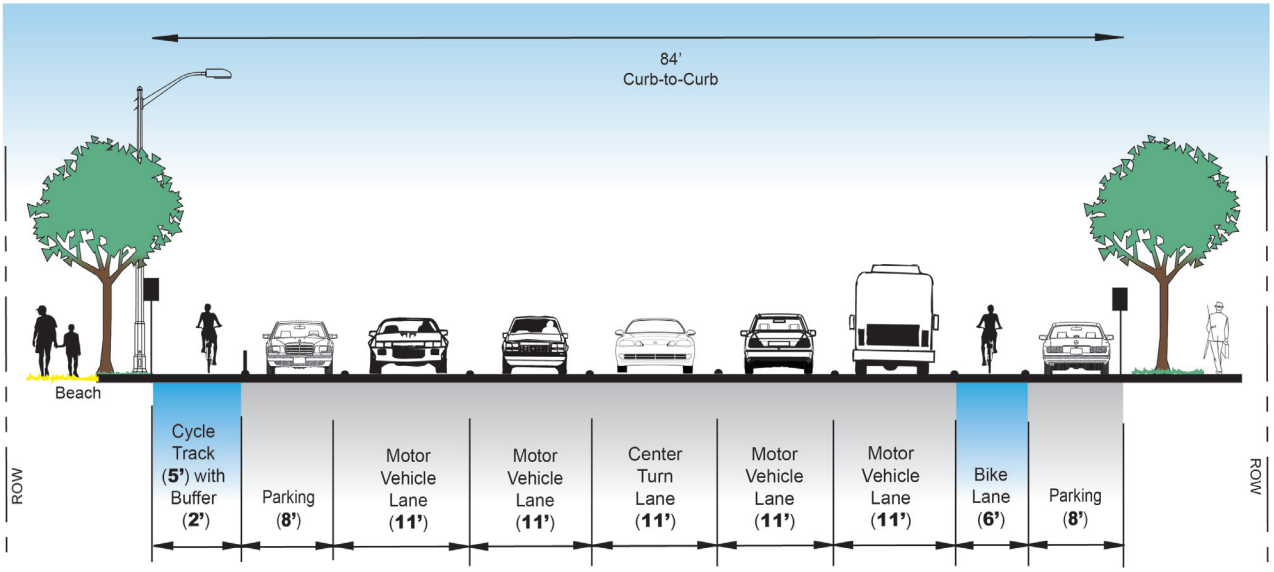
Notes:

- Landscape or planters are optional within raised curb. Parking may be reduced to seven feet to accommodate wider landscaped curb (Alternative 2b). Reflective and flexible bollards recommended to provide visual cue for parallel parking and additional visual separation if raised curb not installed.
- Option to use multi-space parking meters or kiosks or timed paper slip meters on sidewalks to reduce number of meters needed.
- Additional treatments needed for bus stops in southbound direction. Options can include floating bus stop within parking lane and cycle track.

Alternative 2a - Pacific Coast Highway (View northbound)



Alternative 2a - Cross Section



Alternative 2b - Cross Section

Alternative 3: Bicycle Lane (On-street parking retained)

Proposed Horizontal Alignment

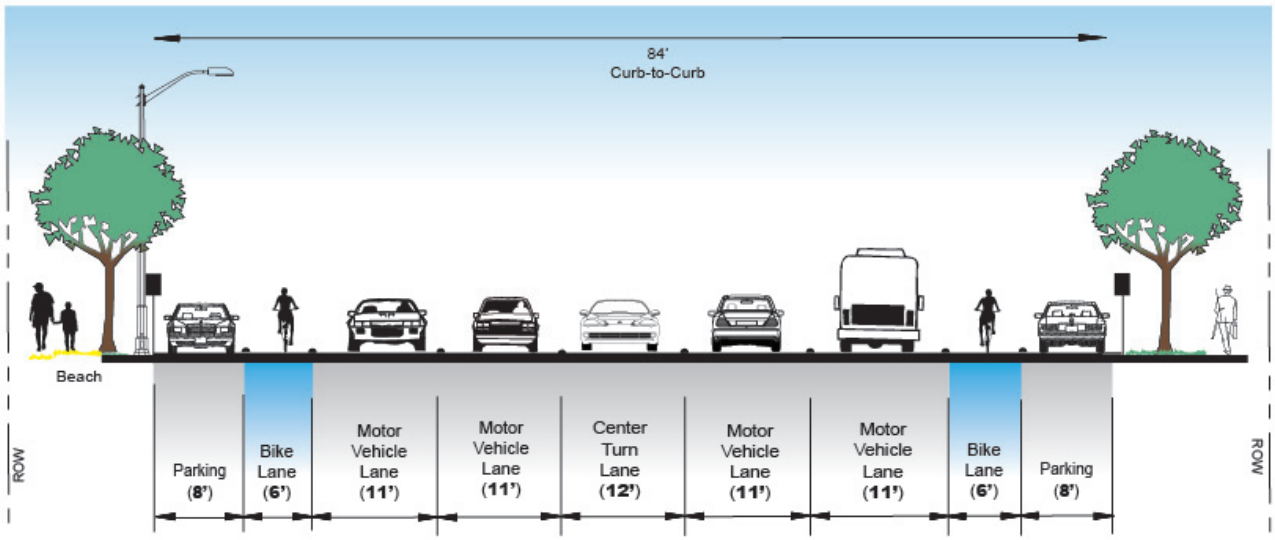
Parking: 2x8′
Bicycle Lane Buffers: N/A
Bicycle Lanes: 2x6′ (Advisory)
Curb Side Travel Lane: 2x11′
Inside Travel Lanes: 2x11′
Center Turn Lane: 12′

Opportunities:

- Meets CA MUTCD and *Highway Design Manual* standards.
- Existing parking remains on both sides.

Constraints:

- Provides minimum horizontal clearance from parked vehicles and opened vehicle doors.
- Meets minimum required lane width for trucks and buses.
- Bus pads will encroach into bicycle lanes.
- Six foot bicycle lanes preferred where speed limit exceeds 40 mph.
- Reduction to 11 foot travel lanes would require Caltrans design exception and Caltrans Construction for Evaluated Program for Experimental Features approval.
- Bus stop encroachment within bicycle lanes.



Alternative 3 - Cross Section

Alternative 3 - Pacific Coast Highway (View northbound)

Alternative 4: One-Way Cycle Tracks

Proposed Horizontal Alignment

Parking: 2x8'
Cycle Track Buffers: 2x1.5'
One-Way Cycle Track Lanes: 2x5'
Curb Side Travel Lane: 2x11'
Inside Travel Lanes: 2x11'
Center Turn Lane: 11'

Opportunities:

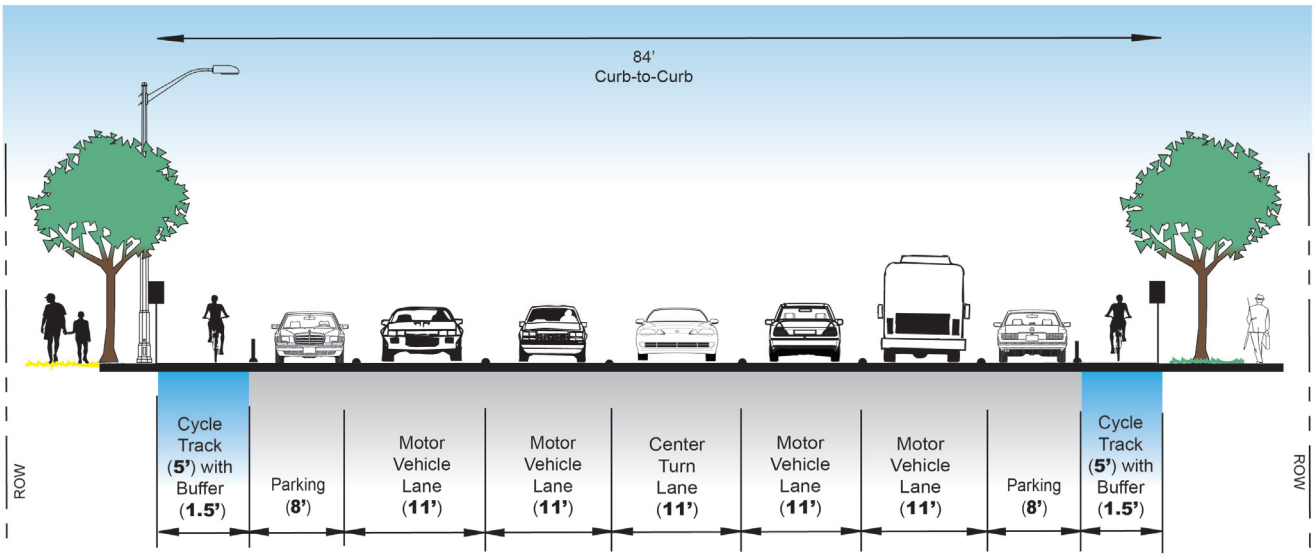
- Provides protected bicycle-only lane in both directions.
- Existing parking remains on both sides.
- Minimal driveway and intersection conflicts on southbound cycle track.

Constraints:

- Street sweeping maintenance.
- Additional treatments needed at intersections and northbound driveways.
- Pedestrian and bicycle conflict when crossing cycle track from parked vehicles.
- Additional treatments needed for bus stops. Options can include "floating" bus stop in parking lane and cycle track.
- Reduction to 11' travel lanes would require Caltrans design exception and Caltrans Construction for Evaluated Program for Experimental Features approval.

Notes:

- Landscape or planters optional within raised curb. Parking may be reduced to seven feet to accommodate wider landscaped area. Reflective and flexible bollards recommended to provide visual cue for parallel parking and additional visual separation if raised curb not installed.
- May need to use multi-space parking meters or kiosks or timed paper slip meters on sidewalks to reduce number of meters needed.
- Additional treatments needed for bus stops in southbound direction. Options can include "floating" bus stop within parking lane and cycle track.
- According to NACTO, three foot minimum desired width for parking lane buffer.



Alternative 4 - Cross Section

Alternative 5: Two-Way Cycle Track

Proposed Horizontal Alignment

Parking: 1x8′
Cycle Track Buffers: 2x3′
One-Way Cycle Track Lanes: 1x11′
Curb Side Travel Lane: 2x13′
Inside Travel Lanes: 2x12′
Center Turn Lane: 12′

Opportunities:

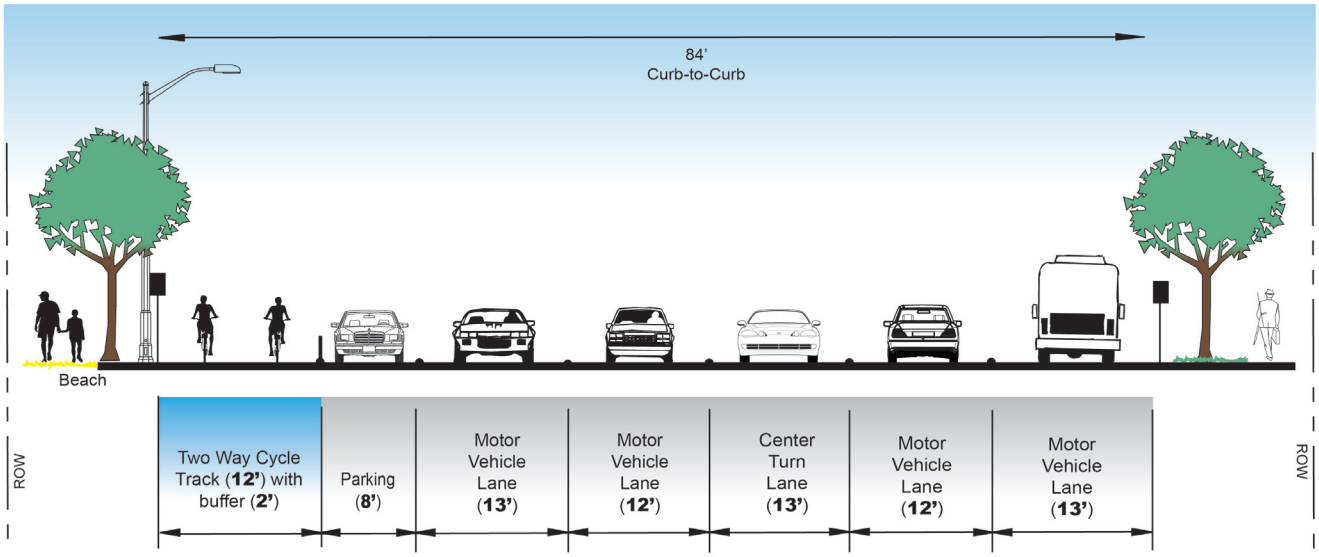
- Provides protected bi-directional bicycle-only cycle track on beach side of Pacific Coast Highway.
- Existing parking remains on southbound lanes.
- Minimal driveway and intersection conflicts.

Constraints:

- Street sweeping maintenance.
- Pedestrian/bicycle conflict when crossing cycle track from parked vehicle.
- Parking on northbound lanes removed.
- Loss of revenue from removed parking.
- Additional intersection treatments needed at Golden-west and Huntington Streets to inform cyclists to navigate to cycle track.
- Some cyclists will still stay on PCH travel lanes to ride at higher speeds, stay in larger groups and avoid pedestrians.
- Conflicts between large cycling group rides and pedestrians.
- Huntington Beach Multi-use Path exists adjacent to PCH.
- Median reconstruction to accommodate cycle track.
- Displacement of transit stops on southbound lanes.
- Cyclists will be riding opposite direction of traffic.
- Would require a Caltrans Construction for Evaluated Program for Experimental Features approval.
- City Zoning and Subdivision Ordinance 231.28 - *If any existing oceanside or on-street parking within the coastal zone is removed, it shall be replaced on a one for one basis in an area that would not result in the loss of any sandy beach area and within walking distance of the existing site. Replacement parking shall be assured prior to the issuance of the coastal development permit and shall be provided before any existing parking is removed so that there will be no reduction in the number of parking spaces available.*

Notes:

- Landscape planting optional within raised curb. Parking may be reduced to seven feet or cycle track to 11 feet to accommodate wider landscaped area. Reflective and flexible bollards recommended to provide visual cue for parallel parking and additional visual separation if raised curb not installed.
- May need to use multi-space parking meters or kiosks or timed paper slip meters on sidewalks to reduce number of meters needed.
- Loss of approximately 99 parking spaces and implications of Ordinance 231.28 (see text under Option 1).
- Additional treatments needed for bus stops in southbound direction. Options can include “floating” bus stop within parking lane and cycle track.
- Additional education and outreach needed prior to construction and implementation of cycle track.



Alternative 5 - Cross Section

Common Issues and Solutions

The following section shows the typical bicycle safety issues, briefly discusses them and provides possible solutions. The graphic below and Table 14 illustrate issues that may be commonly experienced by regular cyclists. See Table 15 and the following pages for examples of possible solutions.

Typical Bicycle Issues

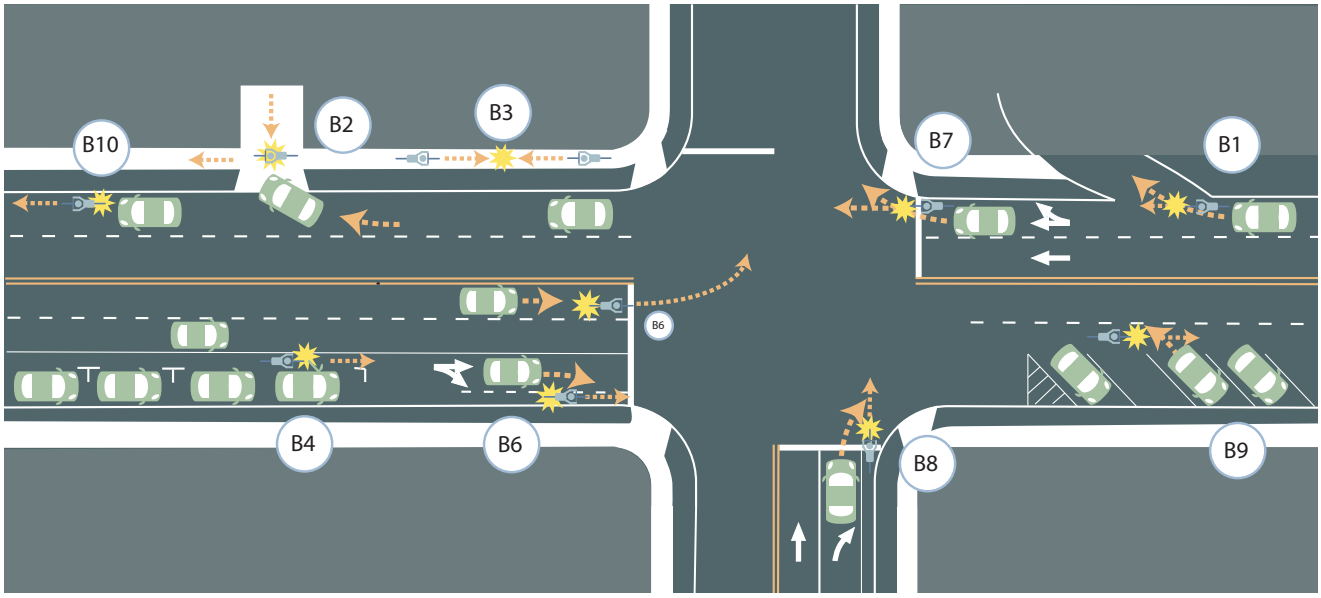


Table 14: Common Bicycle Issues	
Bicycle Issues	**Possible Solutions**
B1 - Crossing Freeway on-ramps: Bicycle facilities that cross freeway on-ramps put cyclists in conflict with crossing traffic accelerating to highway speeds.	**1B, 8B, 9B**
B2 - Alley Conflicts: Cyclists that use alleys for travel 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 the 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 the intersection without providing a facility to allow cyclists to continue through intersection.	**9B, 11B, 12B**
B8 - Bicycle Lanes Placed in the Wrong Location at an 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 often 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 is too narrow for bicycle lanes to be installed and to share with vehicles.	**1B, 4B, 8B, 13B**

Table 15: Possible Bicycle 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 the bicycle lanes and parking lane edge
7B: Install bike box
8B: Increase bicycle awareness signage, "Share the Road" or "Bikes May Use Full Lane"
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 the intersection
14B: Create districts where cycling is not allowed on sidewalks

1B) Sign and enforce appropriately when pedestrians and bikes share the sidewalk - Sacramento, CA

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

3B) Enforce cycling speed limits when sharing facilities with pedestrians - Huntington Beach, CA

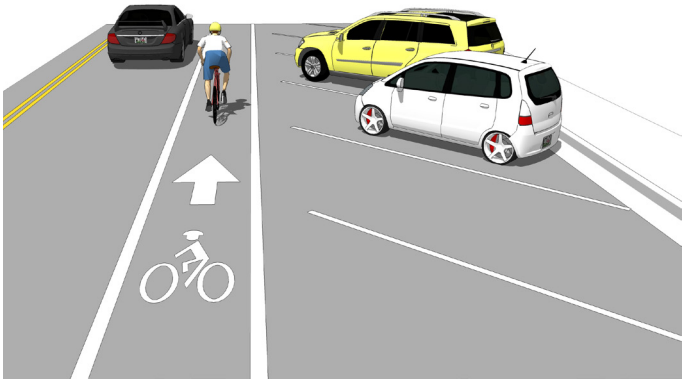
4B) Shared lane markings or "Sharrows" remind vehicle drivers that cyclists can be expected in the roadway and to help cyclists properly place themselves within the roadway. On high bicycle volume streets, a green stripe can be included to further provide horizontal bicycle placement - Oceanside and Long Beach, CA

6B) A buffer removes extra space from a travel lane and increases the distance between vehicular and motor traffic. If the extra space is added to the bicycle lane and not diagonally striped, the bicycle lane can appear wide enough to be confused with a travel lane - Top: Huntington Beach, CA (Photo credit bottom: APBP)

7B) A bike box creates an advanced stop bar for cyclists. This extra room provides an area for cyclists to cue up in front of vehicles waiting at red light. While this treatment is still considered experimental by the MUTCD, it is thought that it increases a cyclist's visibility, and therefore safety - Cambridge, MA

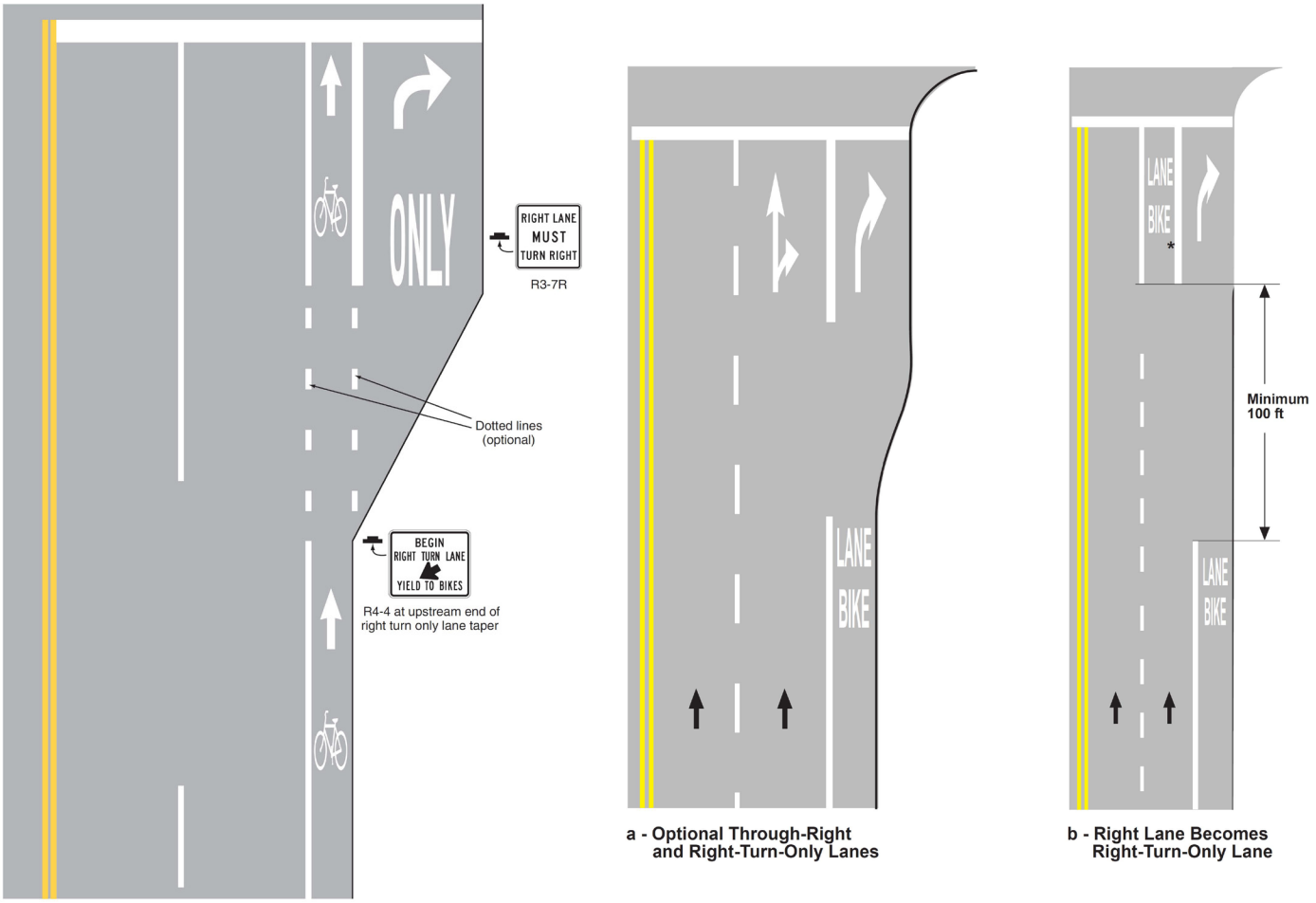
8B) Supplemental signage reminds drivers of bicycle traffic on the street - San Clemente, CA

9B) Color in the bicycle lane is a visible reminder to vehicle drivers to expect cyclists in the bicycle lane (Photo credit: Seattle DOT)



10B) Reverse angled parking allows greater visibility when vehicle drivers are exiting a parking stall

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 (Credit: 2012 CA MUTCD)

13B) Example of Shared Lane Marking directing cyclists through intersection - Philadelphia, PA (Photo credit: City of Philadelphia)

14B) Example of business and commercial district signs enforcing bicycle policies on sidewalks - Coronado, CA

3.3 Recommended Programs

The League of American Bicyclists (LAB) has developed a set of guidelines called the "Five Es" to assist cities in becoming bicycle-friendly communities: Engineering, Education, Encouragement, Enforcement and Evaluation and Planning. These criteria are good references for any community seeking to improve its bicycle environment. The basic strategies are as follows:

Encouragement: Incentives, promotions and programs that inspire and enable people to ride

Education: Programs that ensure the safety, comfort and convenience of cyclists and fellow roadway users

Enforcement: Equitable laws and programs that ensure vehicle drivers and cyclists are held accountable

Engineering: Physical infrastructure and hardware to support cycling

Evaluation and Planning: Processes that demonstrate a commitment to measuring results and planning for the future

Equity (often referred to as the "sixth E"): Actions that support equitable roadway use by cyclists, pedestrians and vehicle drivers

This chapter's program recommendations are meant to be a starting point. They describe a range of examples that could be implemented in the City of Huntington Beach, including some already in place, in which case, the recommendation is to continue them.

The Bicycle Advisory Committee provided prioritization input based on relative importance and feasibility. The five suggested programs that received the most committee support are highlighted with a star symbol (example at right). However, it should be noted that any program may rise in feasibility for a number of reasons, such as if committed volunteers step forward to champion it, if it piques community interest, or if a funding source emerges.

Encouragement Programs

Expand Bike Month Encouragement Efforts

Have the Mayor continue to 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. Coordinate with other agencies on bicycle events such as "Bike to School Day," a ciclovia and bicycle safety courses.

Improve Route Wayfinding Markers

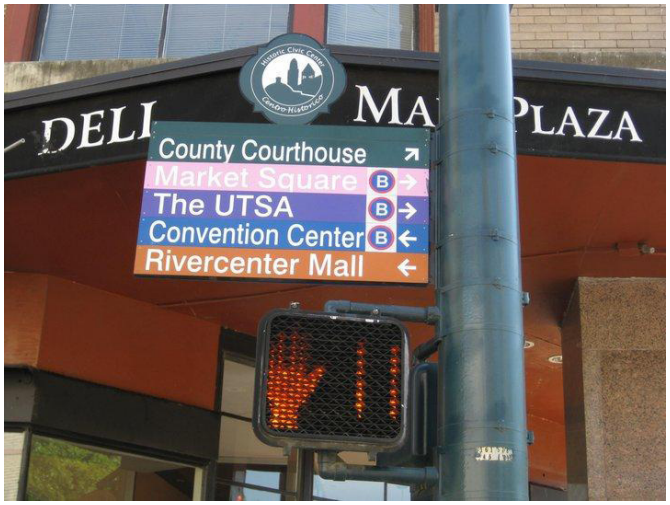
Directional signage allows new cyclists and tourists alike to find their way to their destination or nearby landmark via a recommended route.

The purpose of signage is to direct people and provide information about destinations, directions and/or distances. It increases comfort, assists navigation, warns of approaching roadway crossings and guides users through diverse environments. In the unfortunate event of an emergency, directional signage provides important location information to a potentially uninformed visitor. When applied on a regional level, wayfinding can link communities and provide consistent visual indicators to direct cyclists to their destinations along the route of their choice. Wayfinding signage can achieve public objectives, such as promotion of a community's attractions, education, mile marking and directional guidance. A good wayfinding system functions to achieve the following purposes:

- Help people find destinations from various travel modes
- Establish clear pathways through the use of signs, maps and other landmarks
- Carry user-friendly and understandable messages

People are the single most important component in developing a wayfinding strategy. By identifying user patterns and destinations, wayfinding users understand how the bicycle facility system operates and how to move through spaces and get directed to their destinations.

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



Bicycle wayfinding signage - San Antonio, TX

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?
- Is the goal navigation, directional information, orientation, location information, or interpretation?
- Is the signage sending a clear message?
- Based on the expected user types, what are the safest or most logical paths or routes?

Bicycle wayfinding sign - Portland , OR

Source: www.pedbikeimages.org)

Host Ciclovia Events

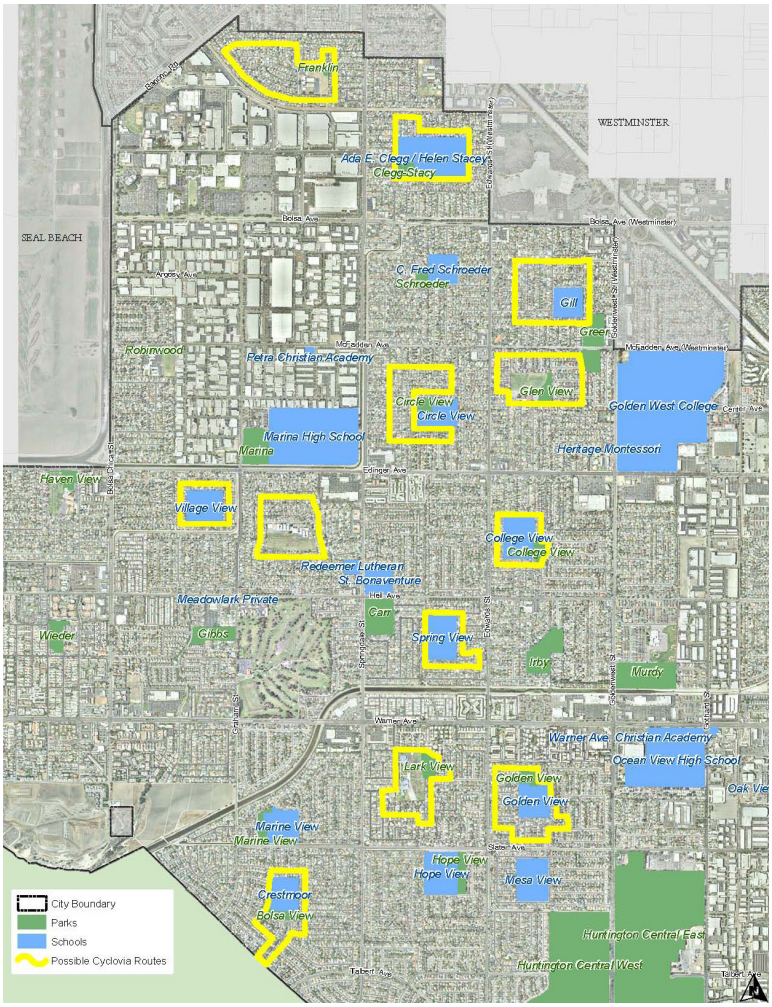
Ciclovias are events in which streets are temporarily closed to motorized traffic and instead reserved for non-motorized transportation. It is a celebration of livable streets and communities, encouraging citizens and businesses to get out onto the streets and enjoy their city through active participation.

A Ciclovía (also cyclovia) is Spanish for "bicycle path" and describes either a permanently designated bicycle route or a temporary event, such as the closing of a street to automobiles for use by self-propelled transportation. Bogotá, Colombia, is often credited with starting ciclovias. These events, sometimes referred to as "Sunday Parkways," occur across the United States, including League Bicycle Friendly Communities Madison, Wisconsin, Portland, Oregon and Washington, D.C. The events typically occur on Saturday or Sunday on a city's main streets. The closed streets often form a circuitous route and are adjacent to a park. In some cities the event occurs once or twice a year, while others occur every weekend throughout the summer. The Portland and Chicago events have different locations around the city each weekend. Los Angeles' most recent events have attracted 150,000 participants.

Musicians and groups promoting free, healthy activities are often stationed along the route. These elements are a unique mix in each city. The theme is often centered on health, exercise and active transportation.

In Huntington Beach this could happen more easily on neighborhood streets and avoid the City's arterial streets. The biggest cost of hosting an event is traffic control and closing streets. If a neighborhood organizes and agrees to close their local streets, the cost and city-wide traffic impact is reduced. By starting small at the neighborhood level, this event can gain attention and excitement for a larger event in the future. Proposed loops are approximately a mile in length and include a park or school where possible. Larger group activities such as a group fitness class or bike rodeo can occur in the park. Proposed loops are depicted for informational purposes only, interested neighborhoods should find a loop route that works best for their needs and interest.

Los Angeles' CicLAvia event (Source: www.pedbikeimages.org)



Suggested Huntington Beach ciclovia routes

Business and Employer Incentive Programs

The City and local businesses can support cycling and the development of a comprehensive bicycle transportation system as a viable alternative to driving.

The City can support the League of American Bicyclists' (LAB) Bicycle Friendly Business program to encourage alternative modes of transportation by employees and customers. Businesses can give discounts, gifts and incentives to those who frequent their business by bicycle. Incentives can also be given to employees who commute by bicycle. The City and local businesses can provide employees with secure bicycle parking and shower and locker facilities to encourage more bicycle commuting.

The City and businesses can also provide fringe benefits through the Bicycle Commuter Benefit Act, which allows employers to reimburse bicycle commuters who regularly use their bikes for a substantial portion of travel between home and work. Companies can reimburse employees on a tax-free basis for "reasonable expenses" incurred as a bicycle commuter. This can include the actual purchase of a bicycle and almost any type of accompanying equipment and accessories such as lights, racks and clothing, up to an annual limit of $240.

If momentum moves beyond a few distinct businesses to a cluster of participating businesses, this effort can be a Bicycle Friendly Business District. Long Beach championed this concept as a pilot project in several neighborhoods: *http://www.bikelongbeach.org/welcome/bike-share-program/bicycle-friendly-business-district-program*.

Implement a Bicycle Sharing Program

Bicycle sharing is an innovative approach to increase bicycle usage throughout an urban area. Providing a bicycle share program, combined with other transportation systems, allows a more diverse, flexible and cost-effective method of alternative transportations. This program can reduce the number of overall vehicle trips and travel time between residences and transit stops, schools and shopping centers.

Successful bicycle sharing programs have been implemented in Canada, Europe and many U.S. cities like Washington DC and Chicago. These systems are highly advanced using key cards, online advanced rental, GPS and Radio Frequency Identification (RFID) technologies making bicycle sharing convenient and simple. Bicycle fleets have been implemented on university campuses, local businesses or for municipal staff use.

Programs such as B-Cycle can even track riders by their associated membership numbers. Data such as distance, duration, calories burned and carbon offset are captured and uploaded to personal web pages at *Bcycle.com*. This data can also be helpful for those commuting and exercising that the same time.

Recently, companies like Bike Nation, DECO Bike and others have implemented their systems at no cost to the host city. These privately funded systems rely upon corporate sponsorship for implementation. DECO Bike has successful systems in Miami Beach and Surfside, FL and Long Beach, NY. Bike Nation has plans for a fleet in Los Angeles, Long Beach and Anaheim.

Zot Wheels bicycle station - UC Irvine

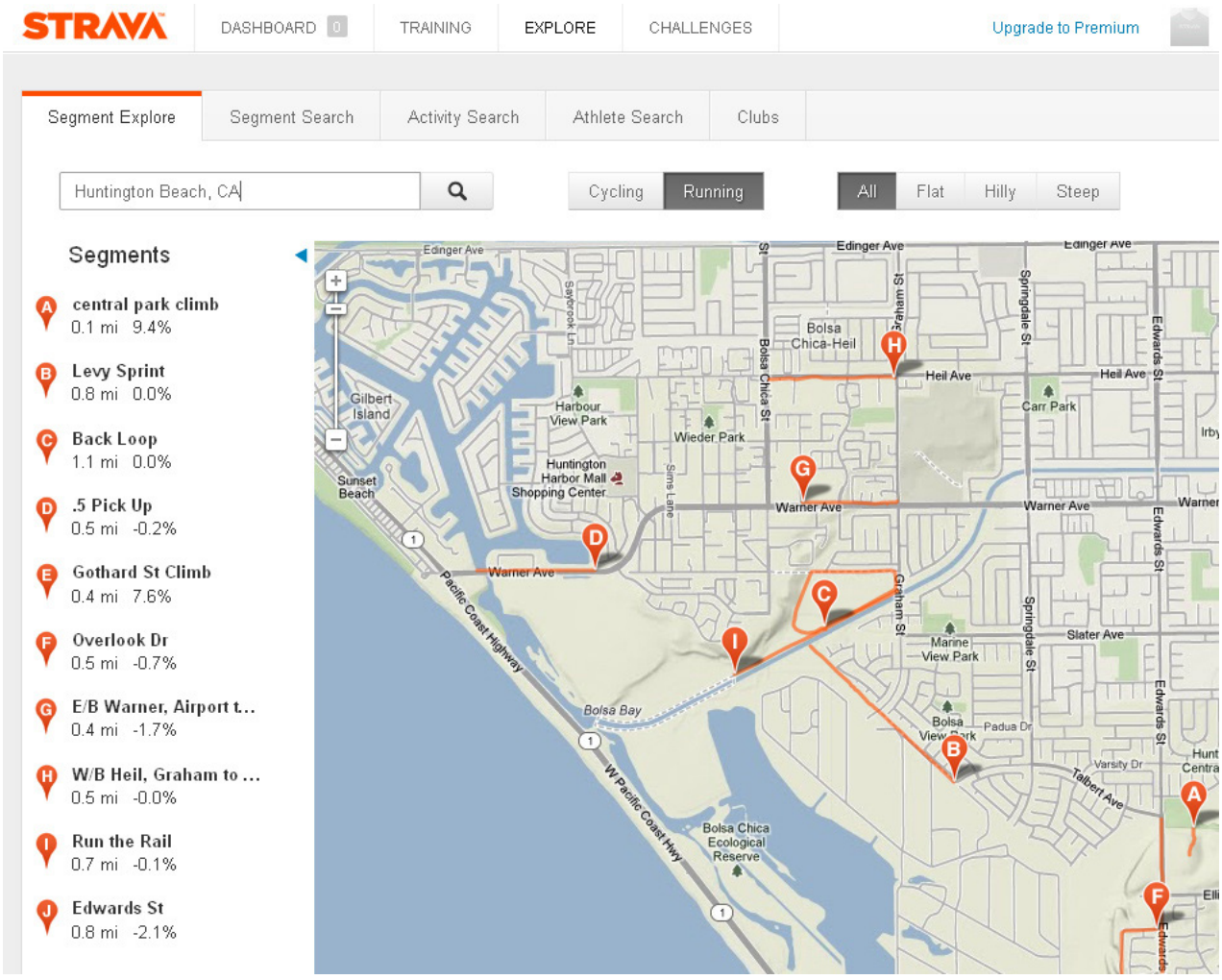
Capitol Bikeshare bicycle station - Washington D.C.

Develop a Series of Short Loop Rides

Southern California is one of the best locations for bicycle riding. The mild year-round weather attracts many professionals and recreational cyclists throughout the year. Bicycle racing and cycling clubs are a great way to get new cyclists into the sport that then carries on to daily life such as bicycle commuting. Local cities such as Long Beach, Ladera Ranch, Carson, Dana Point and San Diego participate in bicycle racing during the spring.

The City can work with the local bicycle clubs and shops to promote and organize a bicycle race and/or weekly bicycle rides throughout the City. Start local races that showcase Huntington Beach's landmarks. Local races can draw attention to the City and at the same time encourage cycling as a fun and healthy sport.

Jax Bicycle Center offers a group ride on Saturday mornings from their Huntington Beach shop. Websites like Strava®, Endomondo® and MapMyRide® also show rides others have published. Very short rides could be held on the small loops developed as possible ciclovia routes.



Example short loop rides - Strava® web site image capture

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 between children, classes, or schools, but simply an encouragement to get children to ride their bikes to school more often. For more information on pricing and funding this program, go to *www.boltage.org*.

BOLTAGE

Boltage program logo

Participate in Walk and Bike to School Day

This annual one-day event is an international effort in more than 40 countries to celebrate the many benefits of safely walking and cycling to school and to encourage more families to consider getting out of the car and onto their feet on the way to school in October. Walking and rolling to school also embodies the two main goals of First Lady Michelle Obama's Let's Move! campaign: to increase children's physical activity levels and to empower parents to make healthy mobility 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. Safe Routes to School programs are sustained efforts by parents, schools, community leaders and local, state and federal governments to improve the health and well-being of children by enabling and encouraging them to walk and bicycle to school. Safe Routes to School activities range from building sidewalks, to getting vehicle drivers to slow down in school zones, to encouraging students to take active trips to school with school-wide competitions. On average, at least half of Walk to School Day events are part of an ongoing SRTS program each year. For more information, go to *www.walktoschool.org*.

Bike to School event with police officer - Phoenix, AZ (Source: www.pedbikeimages.org)

Promote the Bicycle Train 4

These programs are volunteer-based in which children are assisted by adults bicycle to school. This program can be as informal as two families taking turns riding their bikes to school or a more structured route with meeting points, a timetable and a regularly rotated schedule for trained volunteers. Parents often cite safety issues as one of the primary reasons they are reluctant to allow their children to ride to school. Providing adult supervision may help reduce those worries for families who live within cycling distance to schools.

The City can start with one school as a pilot program and expand to other school if there is demand. Success with a bicycle train may inspire a community to build a more structured program. This may include additional routes, more days of cycling and more children. Alternating days between walking and biking to school can provide variety to a structured program. 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 "bike rodeos" at the schools. The participating school principal and administration, law enforcement and other community leaders should be involved to help promote an alternative travel to automobiles. For more information, visit *www.walkingschoolbus.org*.

Bicycle Ambassador Program

A Bicycle Ambassador Program can be implemented employing paid or volunteer bicycle ambassadors to distribute education materials and provide assistance to local users and tourists. Assistance can be in the form of wayfinding, mechanical adjustments, proper bicycle riding and other local knowledge. This is particularly useful in areas with a lot of tourists who may not receive educational and outreach material through traditional means such as a City web site, news outlets or official mailings. The program should include adequate training of ambassadors to provide this wide variety of bicycle assistance.

Bicycle ambassador program logo - Ft. Collins, CO

Continue the Bicycle Valet Service

Huntington Beach maintains a very successful bicycle valet parking program to encourage residents to ride to downtown beach area events. This effectively reduces vehicle parking congestion during particularly high use periods.

Just like vehicle valet operations, users drop off their bicycles and are given a claim ticket to be redeemed when they return to pick up their bicycle. Valet parking allows the consolidation of a large number of bicycles in a relatively compact configuration. Users have the convenience of not having to provide their own locks or having to look for a secure locking location at a time when demand is particularly high.

Valet parking hours are Tuesdays from 5 to 9 PM (during the weekly Surf City Nights street fair and farmer's market) and Saturdays and Sundays from 10 AM to 6 PM throughout the year. The service is free and provided by the City as part of downtown economic development with funding from the South Coast Air Quality Management District. This popular program should serve as a model for other coastal communities. For more information, go to *http://www.huntingtonbeachca.gov/government/departments/ed/business-improvement-districts/downtown-valet-link.cfm*.

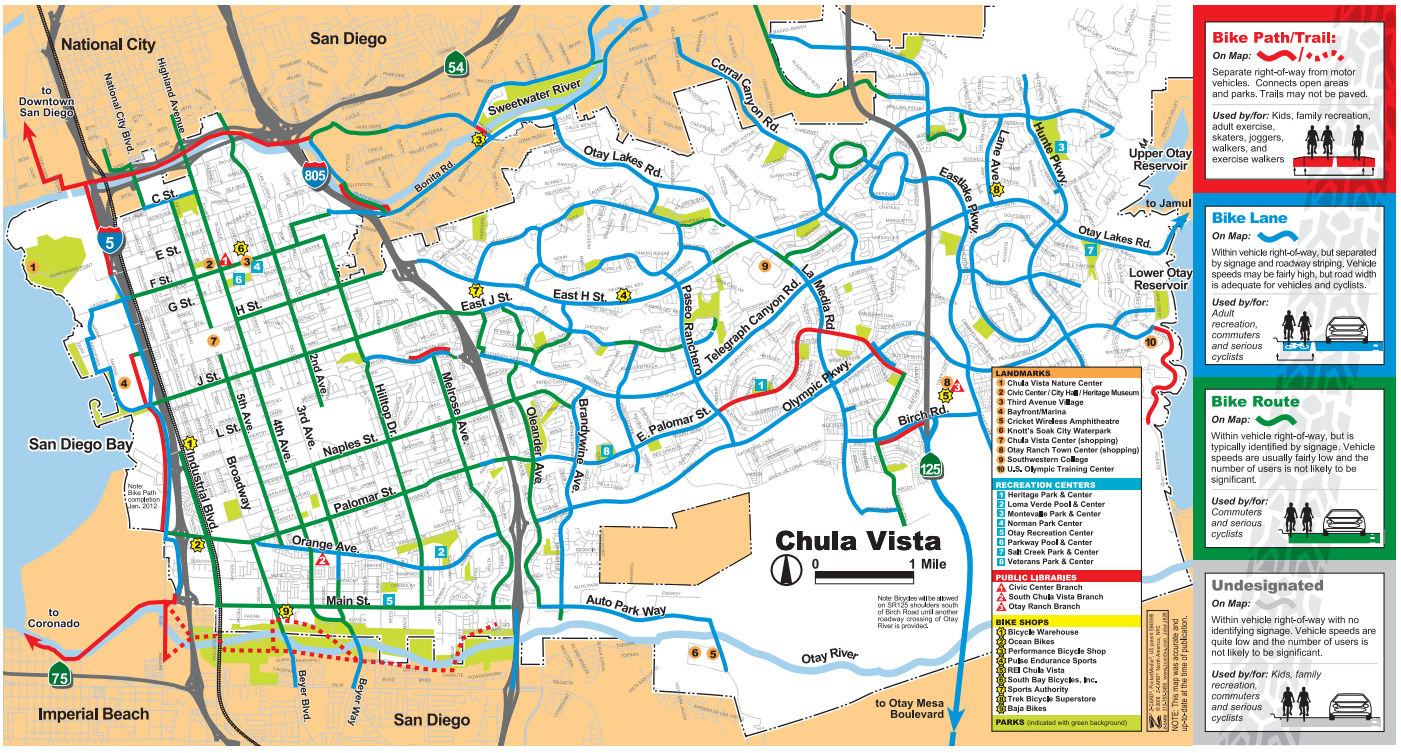
Huntington Beach bicycle valet (Source: City of Huntington Beach)

Update and Refine City Bicycle Facility Map

It is critical to provide a regularly updated map as new bicycle facilities are implemented or existing ones change, which users appreciate. The latest version can be made available digitally via the City web site and distributed as hard copy.

A map showing the facilities, popular destinations and other useful information can encourage more bicycle use. The reverse side of the map can be used for education materials and sponsorship information. If printing costs are prohibitive, seeking funding though grants and sponsorship is recommended. The cartography and graphic design work can be part of a class project through a local GIS or design class.

The City provides a downloadable map as a 36" x 48" PDF file. For ease of use, the City could make this online content available as a more user-friendly Z-Card® folding map, a proprietary design easier to carry, unfold and re-fold than conventional maps. The accompanying images illustrate an example map distributed and updated annually by the City of Chula Vista in southern San Diego County, as well as an excerpt from the reverse side on the next page.



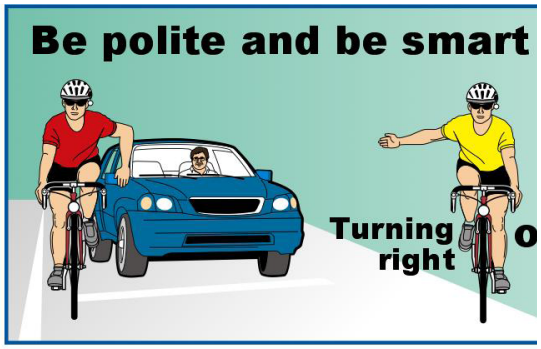
Example bicycle system map
(http://www.chulavistaca.gov/clean/conservation/climate/alternative.asp)

SHARING THE ROAD SAFELY

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

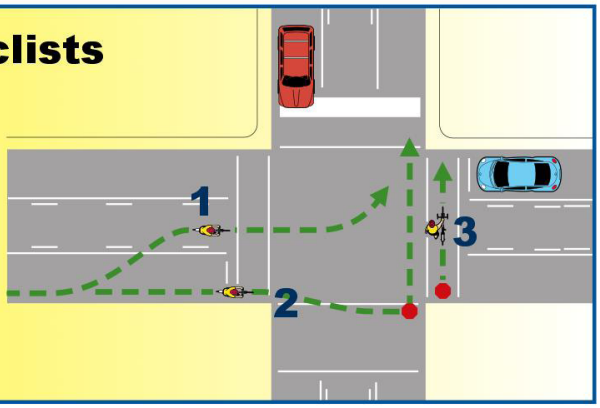
Be polite and be smart. Show respect for all road users and you'll get respect in return.

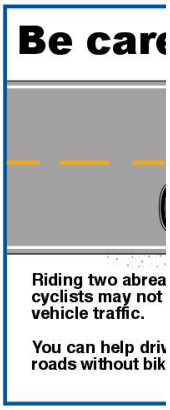
Remember: Cyclists and drivers share the same roads, have the same rights and responsibilities, and must follow the same rules.



Three legal ways for cyclists to make left turns

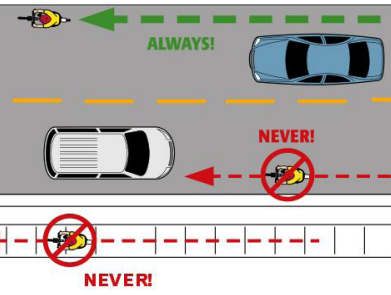
1. Like a vehicle by looking over your left shoulder, signaling, and moving into the left turn lane when it's safe, or
2. By going to the far side of the intersection, turning your bike, and using the roadway when it's safe, or
3. By going to the far side of the intersection, turning your bike, and then walking your bike in the crosswalk.

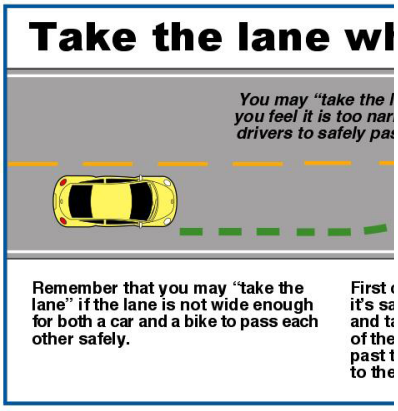




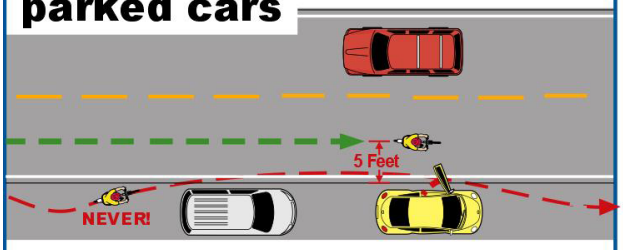
Never ride against traffic!

Ride on the right with the flow of traffic. NEVER ride against traffic on the road, in a bike lane or on a sidewalk. Drivers turning into the road from the side are not likely to look your way, and approaching drivers will not expect you to be coming from the wrong way.





Be careful when passing parked cars



Watch for people in parked cars and ride in a straight line at least five feet from them. Someone could open a car door in front of you.

Be predictable...don't weave in and out between parked cars.

Be seen!

A front white headlight and rear red reflector are required when you ride at night. A red rear taillight is also highly recommended. Wear white or brightly colored clothing or even reflective clothing when riding after dark. Don't forget to make sure you're visible from the sides too. The most effective way to do that is with lights attached to your wheels, or at least reflectors.

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

Education Programs

Institute a Public Education Campaign Aimed at Cyclist, Pedestrian and Vehicle Driver Behavior 3

Develop an education program designed to makes streets a more pleasant and safer place, which can reduce the number of traffic-related collisions, injuries and deaths. This program can address the traffic problems by informing all users, including vehicle drivers, pedestrians and cyclists. The intent is to raise public awareness and discussion about peoples' attitudes and actions on the streets. It can offer new ways of thinking and reinforce that laws are to be followed.

Simultaneous outreach with media, targeted enforcement with cyclist and driver education, handouts, street signage and more will reach the widest audience. To support the effectiveness of a new facility, such as Shared Lane Markings ("Sharrows") and "Bikes May Use Full Lane" signs, this campaign must be timed to occur just before the facility is implemented.

Another approach is targeted outreach to individuals customized to their interests and preferences. The outreach effort can be expanded to include transit and ride share programs. This program, called SmartTrips, has been implemented in several cities and has been attributed to increasing the number of non-motorized trips in Portland.

Newport Beach hung light post banners depicting a "Share the Road" message and created business cards with information about the purpose of "Sharrows." It is likely that future banners will highlight the sharrow graphic to familiarize the public with this relatively new roadway symbol.

The City of San Jose has developed a program and strategic objectives for this type of campaign. Information can be found at *http://www.getstreetsmarts.org*.

The City of San Diego in partnership with the local MPO and bicycle coalition has created a public education campaign called "Lose the Roaditude." More information can be found at *http://losetheroaditude.com*.

"Share the Road" banner - Newport Beach (Source: Frank Peters)

"Sharrow" education card - Newport Beach (Source: Frank Peters)

Expand the Safe Routes to School Program and Encourage All Schools to Get Involved

Encouraging schools to actively participate in the Safe Routes to School grant program may increase the number of children that ride their bikes or walk to school. Inactivity among children is a health issue, one that must be taken seriously. In the age of computers, the internet and video games, outdoor activity has taken a back seat to indoor entertainment. Riding to school is a way to get children active and to introduce exercise into their daily routine. Many parents feel that riding a bicycle on the street is unsafe and do not allow their children to ride to school. Bicycle safety education is important and can be incorporated into after school activities for both children and parents.

Funding to support these education efforts can be obtained at both the federal and state level for a Safe Routes to School program. This funding can be used for a variety of activities including site specific evaluation and planning, infrastructure costs and education programs. The Public Works Department of the City of Huntington Beach has successfully used the Safe Routes to School Grant program to obtain funding for physical improvements through capital grants. Future grant awards could be used for more programmatic elements like student education.

Assistance with funding applications and program facilitation is available from local non-profits. More information can be found at *http://www.saferoutesinfo.org*.

The following are steps to begin the development of a Safe Routes to School Program:

- Include youth perspectives in the development of the Safe Routes to School improvement plan.
- Determine areas of the improvement planning process that student perspectives will be most useful.
- Have students make field observations and conduct assessments on their knowledge, attitudes and beliefs around Safe Routes to School concepts.
- Integrate student assessments into the planning process.
- Identify a youth Safe Routes to School liaison at the participating school district and/or school.
- Use the SafeRoutes toolkit for in-depth descriptions of classroom activities to educate students during the assessment step: *http://www.saferoutesinfo.org/resources/index.cfm*.

Step 1: Form a Safe Routes to School Task Force that involves parents, school administrators and teachers, neighbors and community organizations, City officials and staff, bicycle safety professionals and students.

Step 2: Evaluate existing conditions through parents surveys, student surveys, traffic counts, injury data, speed checks, safe routes checklists and schools policies relevant to school travel modes and physical activity (i.e., P.E. requirements, recess time and after-school activities).

Step 3: Expand the circle by presenting findings to the community, holding a design workshop, having an open house and convening a strategy meeting.

Step 4: Develop a project list and accompanying map by identifying problem areas, setting priorities, grouping projects by geographic area, identifying short-term and long-term solutions, costing out the program and using the whole toolbox of solutions (education, encouragement, enforcement and engineering).

Step 5: Make it official by going through the regular planning process and having the plan adopted in the City plan.

Step 6: Get improvements funded by developing a funding program, identifying funding opportunities and working with the City to apply for grants.

Street crossing - Montclair, NJ ((Source: www.pedbikeimages.org))

Institute a Cycling Education Program through Schools or City's Parks and Recreation Department

Teaching cyclists how to safely ride their bicycle on the streets of Huntington Beach is an important element in making the City a safer place to ride a bike. Currently, Huntington Beach offers classes through Parks and Recreation. However, expanded class options are encouraged in schools or bicycle clubs.

There are numerous examples of successful programs throughout the country. Education programs will need support from the school administration, teachers, parents and community. Education should be considered as essential, if not more essential, than new bicycle facilities.

Among existing programs, the SafeCyclist curriculum is nationally recognized as a comprehensive bicycle safety education course. It is directed at fourth and fifth grade elementary school physical education teachers and their students. In an attempt to institutionalize bicycle safety and physical fitness standards in Texas schools, the Texas Bicycle Coalition Education Fund (TBCEF) sends field instructors to school districts across the state to train and certify P.E. teachers in the program so that they may, in turn, train their students in bicycle and pedestrian safety education. Teachers report that the SafeCyclist Curriculum is easy to implement in the classroom and that students enjoy the materials.

With the financial support of the Texas Department of Transportation, the U.S. Department of Education and committed private and member donors, TBCEF is able to offer the certification training and all curriculum materials to each participating teacher for free. The SafeCyclist Program has gained both national and international recognition and is considered the model for youth bicycle safety education. In 2003, the National Highway and Traffic Safety Administration (NHTSA) conducted an evaluation of the program and concluded that the program positively influenced children's behavior, essential skills and knowledge gain.

If it is not possible to fit it in the curriculum or budget, this program can be a successful after-school or summer school program. An interested bicycle club could host a bicycle education class for the children of its members. The children can learn while the parents are out for a ride. Seeking financial support from a private health care source, like the Kaiser Permanente Foundation, is also an option.

To support expanded education efforts, there is a need for more licensed cycling instructors in Huntington Beach. The training for League of American Bicyclists cycling instructors is done in groups as needed when the number of interested cyclists reaches a minimum. The City, HuBBA, local bicycle club or the Bicycle Advisory Committee must coordinate efforts to gather interest from City departments, local volunteers, advocates and cyclists.

Bike rodeo - Phoenix, AZ (Source: www.pedbikeimages.org)

Include Education Messages in Local Activities

Increased education for vehicle drivers and cyclists is needed. Increase public awareness of the benefits of cycling and of available resources and facilities. Getting more people on bikes will also help modify vehicle drivers' behavior. In other cities, the primary method of education being used to reach both vehicle drivers and cyclists is the LAB's BikeEd Road 1 course.

More educational opportunities such as bicycle rodeos, public service announcements and increased education at schools are opportunities to be investigated to increase awareness within the city and to demonstrate to more people that cycling to work or for recreation is easy, safe and fun. The Orange County Bicycle Coalition (OCBC) and HuBBA are other local resources to utilize for information and assistance.

Install Warning Signage along Popular Routes

Warn vehicle drivers that there may be cyclists sharing the roadway with them. Increase vehicle drivers' awareness of cyclists with cautionary and safety messages. Cycling is an important component of the transportation system and should be respected by other modes of transportation. However, since cyclists are more vulnerable to injury in a collision with an automobile, vehicle drivers should pay particular attention to their presence and safety.

The "Bikes May Use Full Lane" Sign (R4-11) may be used on roadways where no bicycle lanes or adjacent shoulders usable by cyclists are present and where travel lanes are too narrow for cyclists and motor vehicles to safely operate side-by-side. This will coincide with wherever a Shared Lane Marking is used, on most Class 3 facilities planned throughout the City. Additionally, a bicycle warning sign "Share the Road" (W11-1 and W16-1P) can be placed as appropriate.

Sign R4-11 (CA MUTCD)

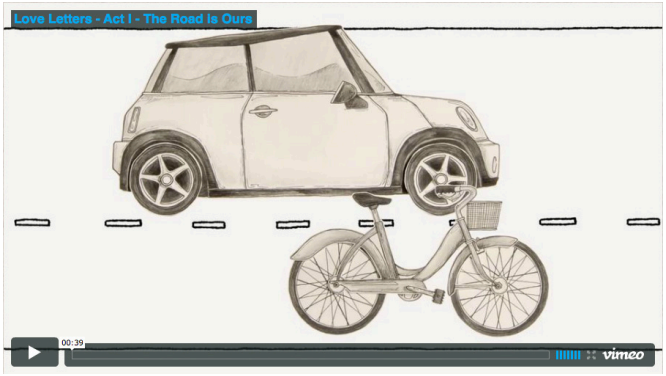
Implement a Proper Helmet Use Program

There are many resources available for assistance with curriculum, materials and information about bicycle safety and specifically helmet usage, fitting and safety statistics. The California Department of Public Health lists California specific resources for teachers: *http://www.cdph.ca.gov/HEALTHINFO/INJVIOSAF/Pages/BicycleSafety.aspx*.

The Bicycle Helmet Safety Institute is another resource with a wealth of information, links and free toolkits. It is a small, non-profit consumer-funded program providing bicycle helmet information at *http://www.bhsi.org*.

Expand Driver Education Efforts

Expand education efforts with the installation of "BICYCLES MAY USE FULL LANE" signage and application of shared lane markings. Educating vehicle drivers and cyclists is an important tool for the safety of those using the roads. The more knowledgeable all users are about the rights and rules each party has, the less potential there will be for conflict and incidents. The education effort should include working to add the "share the road" message in local driver's education classes. These efforts to education can be in driver's education, lunch seminars, through the Huntington Beach Police Department, fliers in water bills, messages on HBTV3 and light post banners. Long Beach has aired several educational messages through the theme "Love Letters" between a bicycle and a car. These videos can be viewed at *http://vimeo.com/45808780*.



"Love Letters" - City of Long Beach web site screen capture

Enforcement Programs

Maintain a Police Bicycle Liaison 2

This liaison would be the main contact for the residents concerning bicycle-related incidents. A liaison that serves the cycling community is an integral piece of communication between law enforcement and the cycling community. The liaison would be in charge of educating fellow officers about bicycle rules, etiquette and behavior to better serve both vehicle drivers and cyclists alike, such as recognizing lawful lane positioning. This liaison should be trained in bicycle safety, 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.

Taking advantage of the liaison's intimate knowledge of local cycling conditions and trends, the City could rely on its liaison to make recommendations to revise City codes and policies to improve safety and convenience.

This has been successful in Los Angeles. Four officers are solely dedicated to bicycle safety and outreach, one for each Los Angeles Police Department Traffic Division. Each Traffic Division is responsible for the investigation of traffic collisions and traffic-related crimes located in its respective bureau.

Encourage Targeted Enforcement

The Huntington Beach Police Department should continue to use targeted enforcement to educate vehicle drivers and cyclists about applicable traffic laws and to share the road. These efforts are an effective way to expand driver and cyclist education. Targeted enforcement should be expanded to warn and educate vehicle drivers and cyclists about breaking the laws, the 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. This will help educate law enforcement, vehicle drivers and cyclists. Possible traffic safety problems where enforcement is part of the solution may include the following:

Vehicle Drivers

- School zone traffic law violations
- Illegal passing of school bus
- Parking violations – bus zone, crosswalks, residential driveways, bicycle lanes, time zones
- Opening vehicle doors into cyclists' path of travel
- Violating cyclists' right-of-way
- Harassing cyclists
- Passing cyclists too close

Cyclists

- Wrong-way cycling, helmet use, and lane positioning

Officer conducting bike rodeo (Source: Prescott Area Daily Photo)

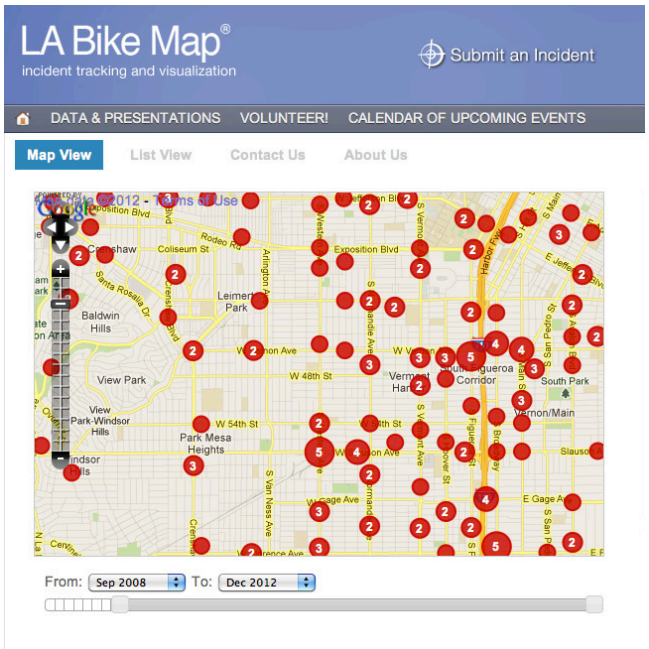
Targeted enforcement (Source: www.pedbikeimages.org)

Establish a 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 the Huntington Beach Police Department and City of Huntington Beach Public Works in this reporting system to help produce more valuable data. Enlist the help of law enforcement with a number of traffic safety duties:

- Enforcement of traffic laws and parking controls through citations and warnings.
- Targeted enforcement of problem areas – an intensive, focused effort during the first two weeks of school and a strategy for the rest of the year.
- Participation in School Safety Committees and Safe Routes to School task force to help identify safety problems and solutions.

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: *http://bikesidela.org/labikemap*.



LA Bike Map® web site image capture

Engineering Programs and Policies

Practice a "Complete Streets" Policy 1

The City of Huntington Beach has adopted a "complete streets" policy. Every street should accommodate cyclists, pedestrians, vehicle drivers and transit users. A complete streets policy will enhance the effectiveness of bicycle use throughout the City by having facilities that will accommodate bicycle travel as well as walking and vehicle driving.

The City of Seattle has documented their complete streets policy implementation here: *http://www.seattle.gov/transportation/compSt_how.htm*.

Expand and Maintain the Bicycle Network

Expand bicycle access to all parts of the City through a signed network of on and off-street facilities, low-speed streets and secure parking. Assist cyclists to cross barriers (such as Interstate 405) and to reach their desired destinations in a convenient, timely and comfortable manner on a bicycle route network. Consider bicycle-friendly design using new technologies and innovative treatments at intersections and on roads and bikeways. Install bicycle stencils and bicycle-sensitive loop detectors (or other detector type) on bikeways as part of new signals, signal upgrades and resurfacing/re-striping projects conforming to the latest CA MUTCD guidelines. More facilities within the bicycle network will encourage bicycle use as a transportation and recreation mode. Drivers will note increased bicycle use throughout the City, which acts as a recurring reminder to safely share the road. Implement candidate facilities through prioritized projects corresponding with available funding.

Local cyclists should be involved in identifying maintenance needs and ongoing improvements. Develop a maintenance schedule for bicycle facilities. This includes regular sweeping and debris removal. When the City or other agencies such as utilities repair roads, the road needs to be restored to satisfactory quality, with particular attention to surface smoothness and restriping suitable for cycling.

Require Training for City Staff and Law Enforcement on Accommodating Cyclists

Require and provide expanded training opportunities for engineering, planning staff and law enforcement on how to best accommodate cyclists. Help City staff to better understand cyclists' needs and behavior, their right to use City streets, as well as multi-use paths for transportation. For example, in California a source for outside evaluation is the Institute of Transportation Studies at the University of California, Berkeley, which has been one of the world's leading centers for transportation research, education and scholarship. Its mission is to conduct research and provide instruction to transportation professionals. Additionally, the City can contact the Orange County Bicycle Coalition (OCBC) for staff training available on a fee for service basis. Membership to the Association of Pedestrian and Bicycle Professionals (APBP) includes a subscription to an email listserv that provides an active discussion on planning and engineering questions relating to bicycle and pedestrian facilities. APBP and other related groups offer webinars on a regular basis.

Increase the Amount of Secure Bicycle Parking

This is an important recommendation because Huntington Beach simply needs more bicycle parking. As heavy as demand is now, it is likely to increase as recommended facilities, programs and policies are implemented.

The City should provide plentiful, high quality bicycle parking to complement the existing and proposed bicycle network. Increasing bicycle parking, especially in areas of high bicycle traffic, will encourage more bicycle use as cyclists become more accustomed to finding safe places to park their bikes at their desired destinations. The downtown and beach areas exhibit the highest demand, especially during the summer and during events at all times of the year. The Downtown Specific Plan suggests specific locations, including near the pier.

Short- and long-term bicycle parking should be provided at employment centers and multi-family developments, at schools, special events, recreational areas and transit facilities. If there is a safe, weather-proof place to park their bicycles, employees may be more inclined to commute by bicycle to work.

Bicycle racks, especially those outdoors along the beach, should be monitored for rust and disrepair. See Appendix A for more information on how to select and install bicycle racks.

Promote Intermodal Travel

The City can do this by increasing connections between public transport and bicycles, by improving access and bicycle parking at bus stops and other public transport vehicles. This can be enhanced by distributing information via local media and on transit facilities on cyclists' options to put their bikes on a bus rack or in a train car to travel outside the City without the use of a personal vehicle.

Additionally, the support of expansion of local or regional transit supports cycling. Every rider of transit walks or bikes to and from their transit stops. What benefits transit most often also benefits other modes of non-motorized transportation.

Identify Opportunities to Make Engineering Improvements

Engaging the public and school officials on the need to improve facilities at schools is important to promote walking and biking to schools, transit stops and shopping centers. Examples of items to address are:

- Traffic control signs in school zone – legible, visible and placed properly
- Curb and pavement markings – crosswalks, parking controls, bicycle lanes and sharrows
- Signal timing adjustments – especially during morning and afternoon peak times, to allow more time for children to cross the street
- Vegetation trimming and object removal from sidewalks and paths
- Drop-off/pick-up operations – safe, efficient, monitored and enforced
- Off-street lots for drop-off/pick-up
- Parking controls – bus zone, ADA spaces, truck loading, no parking and time zones
- Traffic safety monitoring, supervised crossings and school zone enforcement
- Street signage for cyclist and driver education
- Traffic calming

City Hall bicycle racks

Evaluation and Planning Programs

5

Integrate Cycling Network Improvements into Land Use Planning and Development

Future developments such as businesses, parks and residential developments need to take into account bicycles as a mode of transportation and incorporate appropriate facilities to meet their needs. Secured bicycle parking such as racks or lockers, as well as showers and changing rooms are a few examples of incorporating facilities within new developments, along with multi-use paths and bicycle lanes. As a condition of project approval, require development projects to construct adjacent bicycle facilities included in the proposed system and provide adequate bicycle parking.

This includes coordinating bikeway improvements to coincide with already scheduled and funded projects to minimize any overlapping costs or work. For example, include bikeway improvements in the City's Capital Improvement Program.

Several cities have bicycle parking ordinances with minimal requirements for new developments. A copy of a model ordinance for California cities can be found at *http://changelabsolutions.org/publications/CA-bike-parking*.

Seattle uses a Complete Streets Checklist to review any major capital projects: *http://www.seattle.gov/transportation/compSt_how.htm.*

Continue to Support a Permanent Bicycle Advisory Committee

The existing 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 of concern to local cyclists. The BAC can review the implementation and regularly evaluate the progress of improvements in the Bicycle Master Plan. City support for budgeting time and resources for City staff and elected officials to attend and support these meetings is recommended.

Consistency and Cooperation

Strive for intra-agency coordination within the City to ensure that this Plan's recommendations are incorporated at every level of transportation planning, engineering and design. Ensure all City policies, plans, codes and programs are updated and implemented to take advantage of every opportunity to create a more bicycle-friendly community. An integrated approach results in creative funding opportunities, synergistic teamwork and successful projects. An example is a Portland, Oregon project integrating traffic-calming measures and stormwater retention. Intersection curb extensions were installed to serve as a traffic-calming measure, but they were also designed to serve as catch basins to capture stormwater. This ingenious program is called Portland's "Greenstreets Program" and allowed the city to utilize stormwater retention funding to install otherwise costly traffic-calming infrastructure that also improved the local urban visual environment.

Cooperation should also extend beyond City limits. Coordinate with adjacent military, local and regional agencies to ensure strong bicycle connections and inclusion of the City's plans in other planning efforts.

Create City Staff Bicycle Coordinator Position

The position of a bicycle coordinator or program manager can help coordinate between different City departments to ensure consistency and cooperation in planning projects. A bicycle coordinator would manage programs and implement projects listed in the Bicycle Master Plan. The coordinator would be responsible for updating the plan in a timely manner and maintaining a prioritized list of improvements, updated cost estimates and appropriate funding sources. These are critical to integrating cycling into the City's plans and projects and the investment in a staff position would show the City is committed to a "complete streets" transportation system. This investment is also often returned since this position usually is responsible for securing state and federal funding for bicycle projects. For more information, see a full report at *http://www.bikeleague.org/resources/reports*.

Develop a Bicycle Report Card

The City could develop a bicycle report card, a checklist used to measure the success of plan implementation and actions within the City. The report card could be used to identify the magnitude of accomplishments in the previous year, since inception and general trends.

The bicycle report card could include, but be not limited to, a wide menu of factors that the City could present together as a report card or a la carte:

- System completion
- Travel by bicycle or on foot (counts)
- Safety
- Funding

As opposed to focusing on the actual annual change in a given category, the City could establish the report card to track trends. 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 or walkers. Safety should be considered relative to the increase in cyclists and walkers. 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.

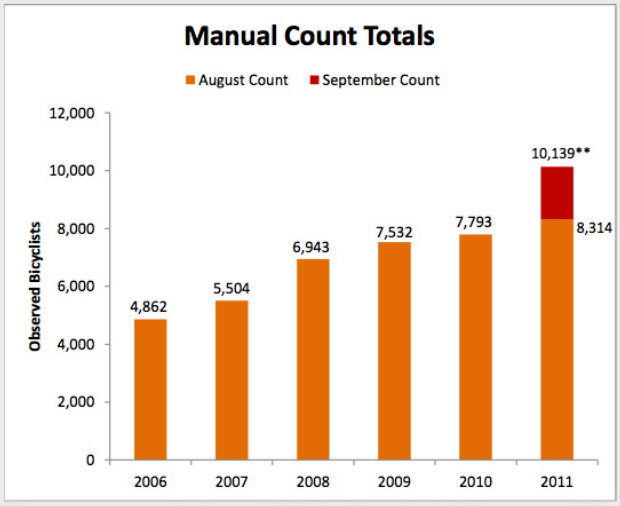
A major portion of the bicycle report card would be an evaluation of system completion. An upward trend would indicate that the City is progressing in its efforts to complete the bicycle network identified in this document. The report card could be updated annually and could be expanded to included elements of other transportation modes in the City, such as transit or pedestrian mobility. The report card could be developed to utilize information collected as part of annual and on-going evaluations, as discussed in the following sections. The report card is not intended to be an exhaustive effort for City staff, but rather a straightforward means of conveying the results of the City's recent efforts to the public.

If a committee is appointed to help implement the Plan and guide future progress as it relates to cycling in the city, it can be a task of the committee to review the report cards and adjust future plans and goals accordingly.

The City of San Francisco publishes their Bicycle Report cards online at *http://www.sfbike.org/?reportcard*.

Key Findings in San Francisco Bicycling for 2011

- ***Since 2006, counts have increased an impressive 71% and are up 7% since 2010.***
- ***A sample of 10,139 riders (September) were manually counted in the peak 90 minutes; approximately 75,000 bike trips occur each day out of 2.2 million total trips across all modes***
- ***SFMTA survey data in 2011 indicate that 3.5% [3] of all trips in San Francisco are made by bicycle, a 75% increase in mode share since 2000 when bicycling was 2% of daily trips***
- ***Late September has 18% more riders than early August***
- ***94% of riders use bicycle facilities as designed***



The count trend since 2006 during the 5:00 p.m. - 6:30 p.m. peak continues to rise.

* These counts represent a sample of, not total daily ridership

** Approximately 18% of the 2011 increase (shown in red) is attributed to shifting the count from early August to late September (see Appendix C).

Bicycle Report Card excerpt - San Francisco MTA

Conduct Annual or Seasonal Cyclist Counts

Conduct regular cyclist counts throughout the city to determine mode share baseline and 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. Cyclist counts can be advantageous in collecting data to study cycling trends throughout the City. Analysis that could be conducted includes:

- Changes in volumes before and after projects have been implemented
- Determining needs for non-motorized facilities
- Trip generation rates
- Prioritization of local and regional projects
- Research on clean air change with increased bicycle use
- Traffic impacts

Counts should be conducted at the same locations and at the same time every year. Conducting counts during different times of the year may be beneficial to understand the differences in traffic patterns throughout the year.

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.

Review Collision Data

The Huntington Beach 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.

Quantify Encouragement Efforts

As part of education and encouragement goals, the City should strive to conduct and quantify the results of at least one bicycle-related encouragement event per month. Examples of encouragement events include Bike-to-Work day events, bicycle rodeos, ciclovias, etc. An annual events tally could be completed in conjunction with publication of a bicycle report card.

Neighborhood Electric Vehicles (NEVs)

Neighborhood Electric Vehicles (NEVs) are becoming popular as an alternative to standard motor vehicles, especially in urban areas and for short trips where the local climate supports the use of these often open-sided vehicles. The California Air Resources Board (CARB) classifies NEVs as zero emissions vehicles. Legally, NEVs are "Low-Speed Vehicles" as defined by CVC Section 385.5:

> (a) A "low-speed vehicle" is a motor vehicle that meets all of the following requirements:
>
> (1) Has four wheels.
>
> (2) Can attain a speed, in one mile, of more than 20 miles per hour and not more than 25 miles per hour, on a paved level surface.
>
> (3) Has a gross vehicle weight rating of less than 3,000 pounds.
>
> (b) (1) For the purposes of this section, a "low-speed vehicle" is not a golf cart, except when operated pursuant to Section 21115 or 21115.1.
>
> (2) A "low-speed vehicle" is also known as a "neighborhood electric vehicle."

To satisfy federal safety requirements for manufacturers, NEVs must be equipped with three-point seat or lap belts, running lights, headlights, brake lights, reflectors, rear view mirrors and turn signals.

State law treats NEVs differently from the approach used for bicycles and other low speed vehicles. NEVs are prohibited from use on streets with speed limits greater than 35 mph, yet bicycles can be used on most streets regardless of speed limit. In addition, electric scooters can be ridden on streets with speed limits of 25 mph, or on streets with limits of 30 mph or more if marked with bicycle lanes. Scooter users must use the bicycle lanes and follow the same rules as cyclists. On residential streets with their typical 25 mph speed limits, NEVs function within the travel lane, and not in the bicycle lanes.

There is interest in expanding the network of NEV-accessible roadways in Huntington Beach to allow a larger travel area by removing existing legal barriers imposed on their use by being restricted from the higher speed streets. This is an evolving issue as mobility choice initiatives, especially those that support California's climate change mandates, continue to be debated at the state level.

Since state law does not allow NEVs or golf carts within bicycle lanes on streets with speed limits greater than 35 mph, expanding NEV use to would require the City to secure special study status through the legislature. NEVs could then operate within these bicycle lanes, but only on designated streets with speeds greater than 35 mph. Wider joint-use lanes may be acceptable, as has been done in several California cities. On these designated streets, the City could adopt a new standard dimension for bicycle/NEV joint-use lanes, perhaps 7-8 feet wide including gutter, and marked appropriately.

Typical NEV (Source: Global Electric Motorcars)

Shared lane signage and markings - Palm Desert, CA (Source: Alexander Meyerhoff, City Manager, City of Holtville)

Equity

Equity is the sixth and most recent addition to the traditional "five E's" of bicycle planning: Engineering, Education, Encouragement, Enforcement, and Evaluation and Planning. The concept of equity in this context is based in transportation justice and the idea that infrastructure should equally and equitably address the needs of all people for all modes. Bicycle infrastructure provides the community a viable and affordable transportation choice that helps to reduce household travel costs. Additionally, this mode serves those too young or too old to drive, as well as those who would simply prefer not to own and maintain a car. This helps to make cycling a key component of an equitable transportation system. Adult cyclists may use a bicycle because of logistical constraints in their life, such as economic hardship resulting in a lack of personal transportation, age or public transit limitations.

Equity among cyclists is also important. There is a wide range of types of cyclists and their respective comfort levels for riding in different conditions. Not every cyclist feels comfortable riding in a bicycle lane or sharing the roadway with fast moving and/or high volume traffic. Education, outreach and encouragement programs can go a long way to help cyclists to feel more confident about riding on the streets.

In addition to these programs, there are engineering solutions that can encourage more riders. The planning and design perspective used in the recommendations reflect the widely used "8-80" concept in which bicycle facilities are planned for users ranging from eight to eighty years old, wherever possible. This is reflected in recommendations for facilities such as the Huntington Beach Multi-use Path and on the parallel Pacific Coast Highway. Bicycle boulevards are another example of a type of bicycle facility that meets the needs of a wide range of users. Opening the flood control channels to cyclists and connecting those channels safely with the road network is another way to expand the Huntington Beach bicycle network to serve a broader range of cyclists.

Census information addressing average median income and vehicle ownership are two particularly useful data sets that directly affect personal mobility. This is because persons living in neighborhoods where these values fall well below the average are more likely to use bicycles to get around. The issue is therefore how readily available proposed bikeway facilities are to and within these neighborhoods. Median income and vehicle ownership data were therefore compared with the proposed system map and analyzed to insure that all people and places within Huntington Beach would be equitably served by a system providing a variety of facility types, such as multi-use paths, bicycle lanes and bicycle boulevards. The following maps were developed to illustrate how the recommended bicycle facility network addresses areas of Huntington Beach where average median income and vehicle ownership fall below the City average.

Figure 21: Median Household Income

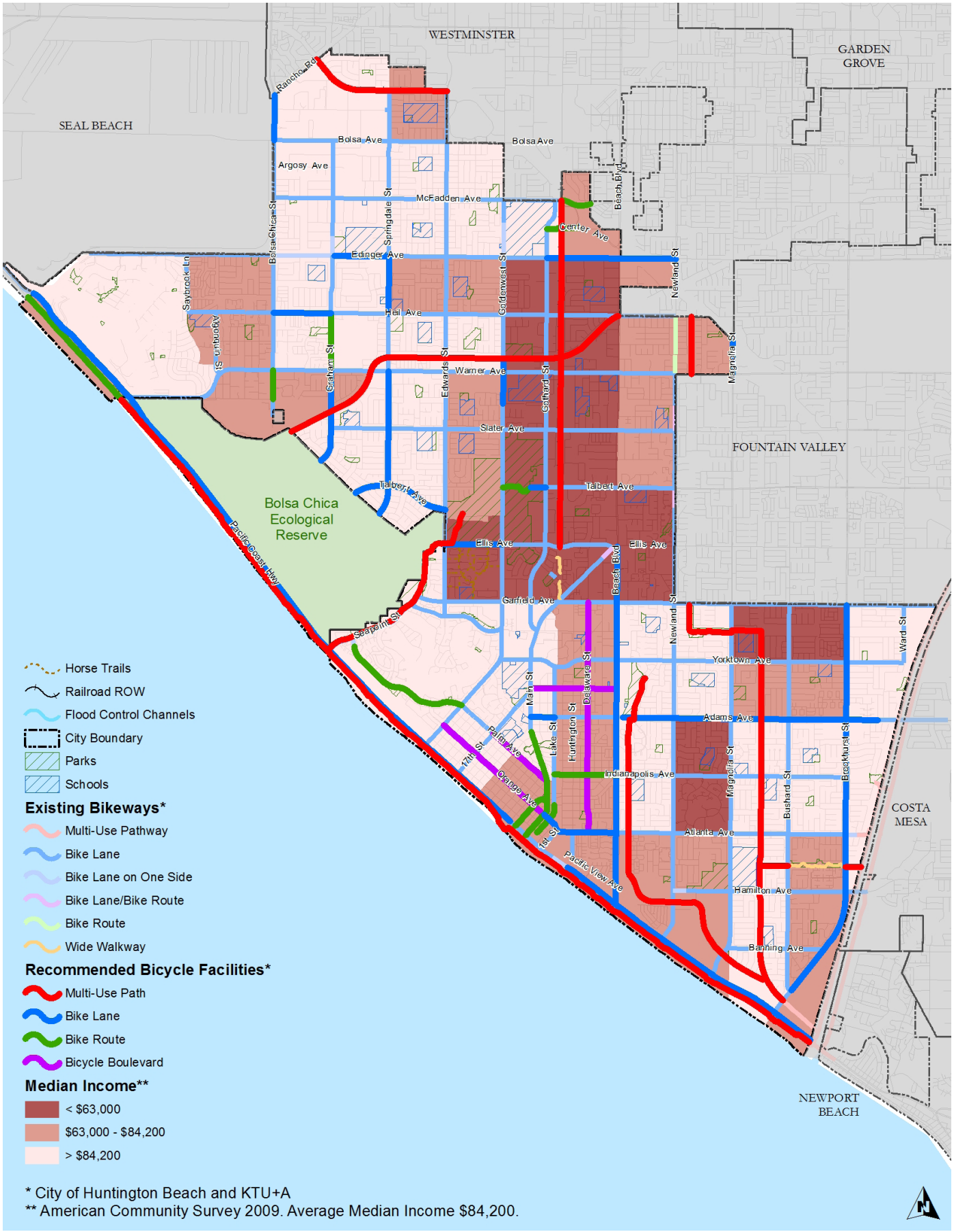
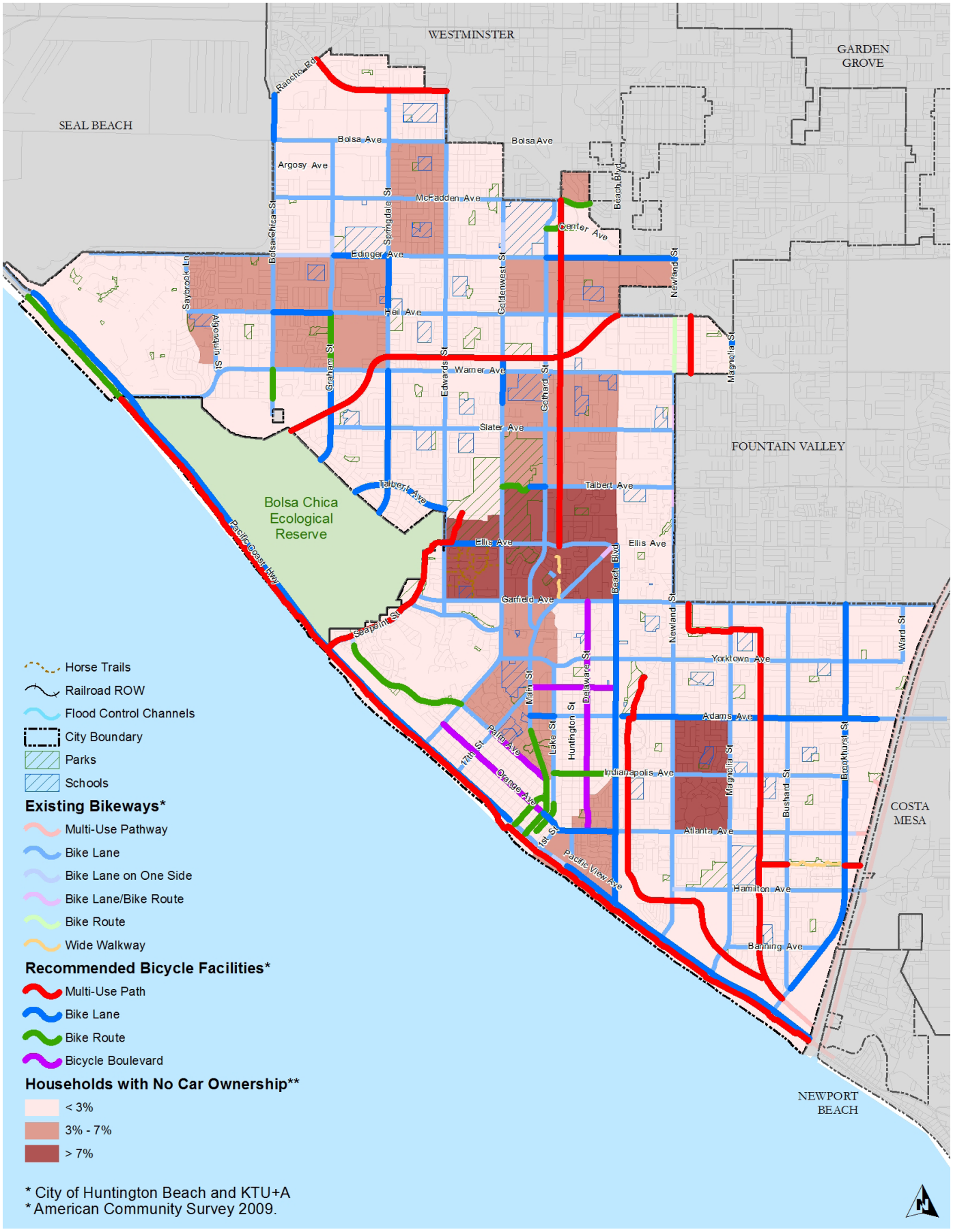


Figure 22: Vehicle Ownership



3.4 Implementation

Plan implementation is necessarily multi-faceted. Besides adoption of goals and policies, it often includes carrying out programs and pursuing project funding, whether through the City's capital improvements project process or grant funding. The plan addresses goals, policies, programs and projects that may not be feasible to implement right away, but are included to stir thinking and inspire long-term actions.

Following plan adoption, the next tasks are getting the programs into the City's or appropriate school district's budget, grant writing to fund projects and programs, amending city standards and design guidelines for consistency, including projects in the City's ongoing capital improvements programs, and implementing goals and policies in the every day processes of City management, whether in site plan review, traffic enforcement or street engineering decisions. Recommendations include education and outreach programs that can be implemented by the City, schools, volunteers and Huntington Beach Police Department. Implementation ultimately rests on the community and City's desire to make this plan a reality.

Implementation Steps

Implementation of some bikeways, such as multi-use paths, bicycle boulevards and other innovative techniques described in this plan, will require a capital improvement project process, including identifying funding, a public and environmental review process and plan preparation. Other bikeway improvements can be integrated into planned construction, such as resurfacing, reconstruction, or utility work.

The majority of bikeway facilities are provided on streets in the form of shared roadways or bicycle lanes. Shared roadways usually require virtually no change to existing roadways, except for some directional signs, occasional markings and minor changes in traffic control devices.

Each project will need a varying level of additional study and analysis before installation. Depending upon the project's complexity, some can be done by City staff or more complex projects can be contracted out to consultants.

Potential Implementation Steps

- Preliminary design and/or technical traffic studies
- Parking study if parking removal is recommended
- Construction drawings and detailed cost estimates
- Funding (CIP, grant, etc.)
- Recommendations for further environmental studies
- Construction

Project Phasing (short-, mid-, and long-term)

Projects listed as short-term are those that would be relatively easy to implement. These projects typically have low construction costs, would not necessitate the acquisition of right-of-way, and/or would require only a categorical exemption under the California Environmental Quality Act (CEQA) guidelines. An example of a potential short-term project could include restriping a roadway to include a buffer to remedy a door zone bicycle lane.

Mid-term projects are projects that will require a small amount of further study or a higher cost than projects that require only typical resurfacing and striping.

The long-term projects involve pursuing grant funding opportunities or further study for the implementation of larger, and potentially more costly improvements. Examples of long-term projects include some of the bicycle boulevard recommendations.

Program Phasing (short-, mid-, and long-term)

Program phasing can be addressed in phases in a similar manner. Each program is equally feasible for implementation, but some will just require more time and money investment from city staff, school districts and/or public volunteers. Short-term programs can be implemented without significant additional costs, staff or policy change. Mid-term programs may require budgetary considerations or significant volunteer involvement. Long-term programs will require additional staff, significant volunteer involvement, and additional funding through a grant or budget additions. On the following pages, the recommended programs from each category have been ranked based upon community workshop and Bicycle Advisory Committee input.

Table 16: Project Phasing

Facility Number and Name	Phase
Class 1	
#1: Huntington Beach Multi-use Path	Short
#2: East Garden Grove - Westminster Channel	Long
#3: Seapoint Street Multi-use Path	Long
#4: Huntington Beach Channel	Mid
#5: Talbert Channel	Mid
#6: Edison Greenway	Mid
#7: Edison Greenway	Mid
#8: UPRR Rail ROW	Long
#9: US Navy ROW	Long
Class 2	
#1: Brookhurst Avenue	Mid
#2: Goldenwest Street	Long
#3: PCH (Goldenwest-7th)	Long
#4: Edinger Avenue	Long
#5: PCH (Huntington-City limit)	Mid
#6: Beach Blvd (Main to PCH)	Mid
#7 Adams Avenue	Mid
#8: PCH (Goldenwest-City limit)	Mid
#9: Springdale Street	Short
#10: Heil Avenue	Short
#11: Edinger Avenue	Long
#12: Orange Avenue	Short
#13: Atlanta Avenue	Short
#14: Talbert Avenue	Short
#15: Adams Avenue	Long
#16: Ellis Avenue	Long
#17: Springdale Street	Short
#18: Graham Street	Short
#19: Bolsa Chica Street	Long
#20: Talbert Avenue	Short
Class 3	
#1: Main Street	Short
#2: McFadden Avenue	Short
#3: Graham Street	Short
#4: Lake St/3rd Street	Short
#5: Indianapolis Avenue	Short
#6: Bolsa Chica Street	Short
#7: Pacific Ave (North and South)	Short
#8: 6th Street	Short
#9: Talbert Avenue	Short
#10: Palm Avenue	Short
#11: Center Avenue	Short
Bicycle Boulevards	
#1: Palm Ave	Long
#2: Delaware St	Long
#3: Orange Ave	Long
#4: Utica Ave	Long

Table 17: Program Phasing

Program Name	Phase
Encouragement	
Expand Bike Month Encouragement Efforts	Mid
Improve Route Wayfinding Markers	Mid
Host Ciclovia Events	Long
Business and Employer Incentive Programs	Short
Implement a Bicycle Sharing Program	Long
Develop a Series of Short Loop Rides	Short
Implement the Boltage Program at Schools	Long
Participate in Walk and Bike to School Day	Short
Promote the Bicycle Train	Mid
Bicycle Ambassador Program	Long
Continue the Bicycle Valet Service	Short
Update and Refine City Bicycle Facility Map	Mid
Education	
Institute a Public Education Campaign Aimed at Cyclist, Pedestrian and Vehicle Driver Behavior	Mid
Expand the Safe Routes to School Program and Encourage All Schools to Get Involved	Mid
Institute a Cycling Education Program through the Schools or City's Parks and Recreation Department	Mid
Include Education Messages in Local Activities	Short
Install Warning Signage along Popular Routes	Mid
Implement a Proper Helmet Use Program	Mid
Expand Vehicle Driver Education Efforts	Mid
Enforcement	
Designate a Police Bicycle Liaison	Mid
Restart Adult Bicycle Diversion Program	Short
Continue Targeted Enforcement	Short
Establish a Law Enforcement Referral Process	Mid
Engineering	
Practice a "Complete Streets" Policy	Short
Expand and Maintain the Bicycle Network	Long
Require Training for City Staff and Law Enforcement on Accommodating Cyclists	Short
Increase the Amount of Secure Bicycle Parking	Mid
Promote Intermodal Travel	Mid
Identify Opportunities to Make Engineering Improvements	Mid
Evaluation and Planning	
Integrate Cycling Network Improvements into Land Use Planning and Development	Short
Continue to Support a Permanent Bicycle Advisory Committee	Short
Consistency and Cooperation	Short
Create City Staff Bicycle Coordinator Position	Long
Develop a Bicycle Report Card	Mid
Conduct Annual or Seasonal Cyclist Counts	Short
Review Collision Data	Short
Quantify Encouragement Efforts	Mid

Maintenance and Basic Operations

The maintenance of bicycle facilities and the monitoring and assessment of their performance are critical for ensuring safe and efficient travel for cyclists. This includes regular sweeping to remove debris. The "sweeping" effect of passing motor vehicle traffic readily pushes debris such as litter and broken glass toward the roadway edges where it can accumulate within an adjoining bicycle facility. Since the potential for loss of control can exist due to a blowout caused by broken glass, or through swerving to avoid other debris, proper maintenance is directly related to safety. For this reason, street sweeping must be a priority on roadways with bicycle facilities, especially in the curb lanes and along the curbs themselves. The police department could assist by requiring towing companies to fully clean up crash scene debris. This would prevent glass and debris from being left in place after a motor vehicle crash, or simply swept to the curb or shoulder area. A suggested minimum monthly sweeping schedule is recommended for heavily used Class 1 and 2 facilities, and twice a year where use is light. Class 3 facilities should be swept twice a year.

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 followed by proper bikeway re-striping. When combined with poor surface reconstruction following long periods out of service due to road work, this can result in the eventual loss of affected bikeway facilities and decrease the number of cyclists regularly using the facilities.

Adjacent construction projects that require the demolition and rebuilding of roadway surfaces can cause problems in maintaining and restoring bikeway function. Construction activities controlled through the issuance of permits, especially driveway, drainage, utility, or street opening permits, can have an important effect on the quality of a roadway surface where cyclists operate. Such construction can create hazards 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, as well as effective control of construction activities wherever bikeways must be temporarily demolished. 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.

Strive for intra-agency coordination within the City to ensure that this plan's recommendations are incorporated at every level of transportation planning, engineering and design. An integrated approach results in creative funding opportunities, synergistic teamwork and successful projects. An example is a Portland, Oregon project integrating traffic-calming measures and stormwater retention. Intersection curb extensions were installed to serve as a traffic-calming measure, but they were also designed to serve as catch basins to capture stormwater. This ingenious program is called Portland's "Greenstreets Program" and allowed the city to utilize stormwater retention funding to install otherwise costly traffic-calming infrastructure that also improved the local urban visual environment.

Planning for bicycle facilities on roadways should begin at the very earliest stage of project development on all sizes and types of roadway projects. Even the smallest roadway resurfacing project could result in a missed opportunity if cyclists and Bicycle Master Plan projects are not taken into consideration at the initiation of the project. Each roadway project should be cross-referenced with the Bicycle Master Plan Project list to ensure any projects on the same roadway are implemented along with ongoing improvements.

Bikeway Funding 4

4.1 Typical Construction Costs

The following lists the unit cost assumptions for typical bicycle infrastructure improvements used to develop cost estimates for the proposed bicycle facilities. These cost estimates were developed based on recent construction bid results in California. All costs are assumed to be in 2012 dollars.

Tasks needed to be accomplished prior to facility design, such as environmental clearance, coastal access processing or other studies, may be an additional cost, sometimes 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 were recently exempted from CEQA review.

Description	Unit	Cost
Class 1 multi-use (4" HMAC over 8" Class 2 AB)	Linear Foot	$150
Class 2 bicycle lanes (minor restriping)	Linear Foot	$13
Class 2 bicycle lanes (restriping with slurry seal)	Linear Foot	$40
Class 2 bicycle lanes (streetscape reconstruction)	Linear Foot	$600
Class 3 bicycle route	Linear Foot	$1
Curb and gutter	Linear Foot	$21
Signs	Each	$150
Decomposed granite	Square Foot	$2.50
Bicycle rack	Each	$225
Restriping, minor	Linear Foot	$13
Restriping, major (includes slurry seal)	Linear Foot	$40
Retaining wall	Linear Foot	$80
Bicycle detection (Type D in vehicle lanes)	Per Inter. Approach	$4,000
Traffic signal	Each	$120-250,000
Roundabout	Each	$1.5 million
New roadway	Mile	$4.9 million

4.2 Bicycle Facility Cost Estimates

A list of proposed bicycle facilities was developed for the City with the goal of increasing connectivity and generally expanding the dedicated bicycle network. This section provides planning-level construction cost estimates for the facilities listed in the plan, describes the methodology behind the cost estimation and provides the results of the assessment.

Methodology

Proposed facilities were classified under several categories to help estimate costs:

- Class 1 Multi-use Path – New Construction
- Class 1 Multi-use Path – Upgraded Facility
- Class 2 Bicycle Lane – Striping Only
- Class 2 Bicycle Lane – Road Diet Restriping
- Class 2 Bicycle Lane – Roadway Widening
- Class 3 Bicycle Route
- Bicycle Boulevard

Each proposed facility was assigned to one of the categories, and a per-mile construction cost was developed for each category. The costs are based on recent construction bid data for materials costs, assumptions for facility geometry, and recent experience with similar projects in Orange and Los Angeles Counties. All of the costs include the following assumed additional factors:

Design/Engineering	10 percent
Mobilization	10 percent
Minor items	15 percent
Construction Management	10 percent
Contingency	20 percent

Cost Categories

Class 1 Multi-use Path – New Construction

Assumes a 10 foot wide path of four inch hot mix asphalt over an eight inch aggregate base. Includes striping of edges and centerline and path signage at intersections, but no fencing or landscaping. Grading is limited to roadway excavation beneath the path. The unit cost is $700k per mile of path, and $150k per roadway intersection for installation of a signalized crossing. This does not include right-of-way acquisition or environmental remediation.

Class 1 Multi-use Path – Upgraded Facility

Assumes widening in some locations and modifications to curvature that would require reconstruction of the path. Additional earthwork and grading may be added in some areas. Due to the variability of work along the existing path, it is assumed that the cost would be half that of a new path, and is set at $350K per mile.

Class 2 Bicycle Lane – Striping Only

This category assumes that adequate space exists along the roadway to simply add bicycle lane striping and markings without modifying the roadway further. It assumes that the road is in good condition and doesn't require maintenance or rehabilitation as part of the striping project. No modifications to intersection signal equipment are assumed. The cost is $50k per mile.

Class 2 Bicycle Lane – Road Diet/Restriping

This category assumes that there is sufficient curb-to-curb width to install the bicycle lane, but that modifications to existing striping would be necessary to make room. This includes removal of existing striping and installation of new striping, as well as slurry-seal maintenance. This could be a reduction in vehicle lanes or narrowing of existing lanes. The assumed unit cost is $200k per mile, with no assumed modifications to intersection signal equipment.

Class 2 Bicycle Lane – Roadway Widening

This category assumes that the curb-to-curb width is not sufficient to install bicycle lanes, and therefore the roadway would be widened by 10 feet to accommodate them. This includes widened pavement sections, new curb, gutter and sidewalk, and relocation of street lighting. Each intersection would also be modified to move signal equipment and install new curb returns. The assumed unit cost is $2.5M per mile, and $250k per intersection.

Class 3 Bicycle Route

This category assumes signage and shared-use pavement markings ("Sharrows") along the length of the route at intervals of 0.25 miles in each direction and at intersections. This assumes that the roadway does not require rehabilitation or maintenance. The assumed unit cost is $20k per mile.

Bicycle Boulevards

Bicycle boulevards are essentially Class 3 route facilities that may feature structural roadway modifications such as traffic calming measures or changes in intersection priority or access. Because these facilities need to be evaluated in more detail to determine the extent of extra modification, this plan assumes that costs are equivalent to those of typical Class 3 facilities with signage and pavement markings and would be revised upward as needed when further study is performed.

Results

All proposed multi-use paths were considered to be either new construction or improvements of existing facilities, and assigned a per-mile cost for the length of the facility. Table 18 summarizes the results.

All proposed bicycle lanes were considered to be additional striping, restriping (for reduction of lanes or lane widths), or roadway widening, and assigned a per-mile cost for the length of the facility.

The Bicycle Master Plan proposes five alternatives for Pacific Coast Highway. The first four alternatives are all variations of striping modifications, and therefore fall under the category of roadway restriping/road diet. Alternative 5, however, proposes to modify the median, shift all lanes to the north/east to allow room for a beach-adjacent cycle track. Because this does not entail full reconstruction of the curbs and sidewalks, it does not fall under the category of widening.

Based on the structural modifications to the roadway, a per-mile cost of $1.0M was assigned. Assuming that the 2.0 mile stretch of PCH between Goldenwest Street and Beach Boulevard is the only candidate for this treatment, the construction cost for Alternative 5 is estimated to be $2.0M.

All bicycle routes and bicycle boulevards were considered to include Sharrows and signage along the length of their routes, and assigned a per-mile cost for the length of the facility.

Table 18: Facility Cost Estimates

No.	Class 1 Multi-use Paths	Cost Category/Length	Cost	Notes
1	Huntington Beach Multi-use Beach Path	Upgraded Facility 10 mi	$3.5M	
2	East Garden Grove - Westminster Channel	New Construction 4 mi 6 crossings	$3.7M	
3	Seapoint Street Multi-use Path	New Construction 1.75 mi	$1.23M	Likely crossing at Edward St. and Palm Ave. already signalized w/crosswalks; no upgrades assumed
4	Huntington Beach Channel	New Construction 2.5 mi 5 crossings	$2.5M	
5	Talbert Channel	New Construction 3.25 mi 6 crossings	$3.18M	
6	Edison Greenway	New Construction 1.0 mi 2 crossings	$1.0M	Assumes that current meandering path will not be used as part of the alignment; indirect and narrow, and needs rehab.
7	Edison Greenway	New Construction 0.5 mi	$350K	
8	UPRR Rail ROW	New Construction 3.0 mi 5 crossings	$2.85M	Path not currently feasible; cost assumes future abandonment and rail removal by UPRR
9	US Navy ROW	New Construction 1.2 mi	$870K	Path not currently feasible; cost assumes future abandonment and rail removal by US Navy

No.	Class 2 Bicycle Lanes	Cost Category/Length	Cost	Notes
1	Brookhurst Avenue	Striping Only 3.5 mi	$175K	
2	Goldenwest Street	Roadway Widening 0.4 miles 1 crossing	$1.25M	Assumed that widening would be required based on medians and lane widths
3	Pacific Coast Highway (7th to Goldenwest Street)	Road Diet/Restriping 1.0 mi	$200k	Estimate consistent with PCH Alts 1-4; Alt 5 would assume increased cost due to median modifications
4	Edinger Avenue	Road Diet/Restriping 0.7 mi	$140k	
5	Pacific Coast Highway (Goldenwest Street to City Limit)	Striping Only 5.25 mi	$263k	Estimate consistent with PCH Alts 1-4; Alt 5 would assume increased cost due to median modifications
6	Beach Boulevard	Striping Only 3.0 mi	$150k	
7	Adams Avenue	Striping Only 2.5 mi	$125k	
8	Pacific Coast Highway (Huntington Street to City Limit)	Striping Only 2.5 mi	$125k	Estimate consistent with PCH Alts 1-4; Alt 5 would assume increased cost due to median modifications
9	Springdale Street	Striping Only 0.5 mi	$25k	
10	Heil Avenue	Striping Only 0.5 mi	$25k	Section appears to be mostly striped already
11	Edinger Avenue	Road Diet/Restriping 0.5 mi	$100k	
12	Orange Avenue	Striping Only 0.2 mi	$10k	
13	Atlanta Avenue	Striping Only 0.5 mi	$25k	
14	Talbert Avenue	Striping Only 0.25 mi	$12.5k	
15	Adams Avenue	Striping Only 0.2 mi	$10k	
16	Ellis Avenue	Road Diet/Restriping 0.5 mi	$100k	
17	Springdale Street	Striping Only 1.25 mi	$62.5k	
18	Graham Street	Striping Only 0.75 mi	$37.5k	
19	Bolsa Chica Street	Road Diet/Restriping 0.5 mi	$100k	
20	Talbert Avenue	Striping Only 1.0 mi	$50k	

No.	Class 3 Bicycle Routes	Length	Cost
1	Main Street	1.25 mi	$25k
2	McFadden Avenue	0.25 mi	$5k
3	Graham Street	0.5 mi	$10k
4	Lake Street/3rd Street	0.3 mi	$6k
5	Indianapolis Avenue	0.5 mi	$10k
6	Bolsa Chica Street	0.25 mi	$5k
7	Pacific Street	1.5 mi	$30k
8	6th Street	0.38 mi	$8k
9	Talbert Avenue	0.25 mi	$5k
10	Palm Avenue	1.5 mi	$30k
11	Center Avenue	0.25 mi	$5k

No.	Bicycle Boulevards	Length	Cost*	Notes
1	Palm Avenue	0.75 mi	$15k+	Additional study required to determine cost of traffic calming and improvements at intersections
2	Delaware Street	2.5 mi	$50k+	Additional study required to determine cost of traffic calming and improvements at intersections
3	Orange Avenue	1.17 mi	$24k+	Additional study required to determine cost of traffic calming and improvements at intersections
4	Utica Avenue	0.75 mi	$15k+	Additional study required to determine cost of traffic calming and improvements at intersections

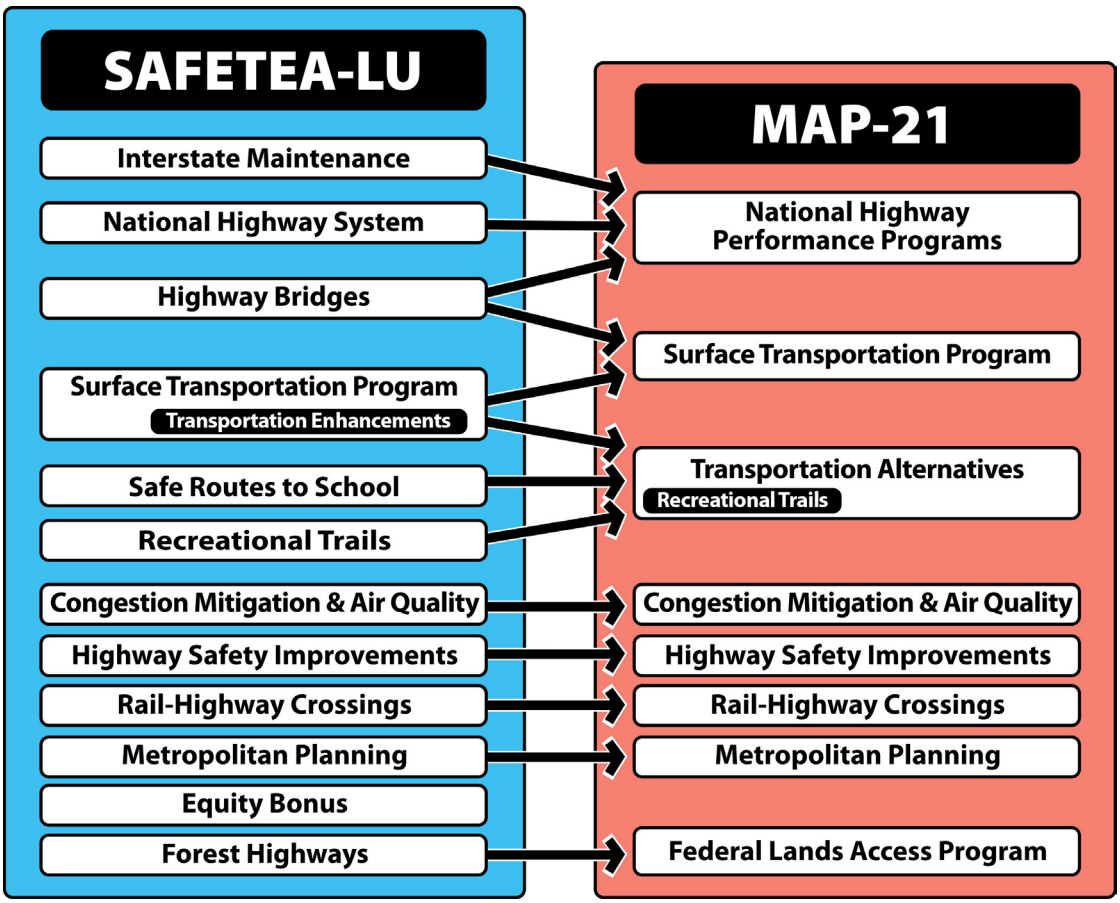
**Note: Bicycle boulevards have not been implemented to the extent that other facility types have been, nor are there widely accepted standards in place. Their costs are therefore highly variable and can increase significantly if the full range of potential physical improvements are included, such as 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 only signage and shared lane ("Sharrow") markings.*

4.3 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. Much 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 are still many unknowns 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. For more in-depth information on the funding changes and the regional funding implications, contact OCTA Federal Relations Manager, Richard Bacigalupo or visit OCTA's Website: *About OCTA - Government Relations http://www.octa.net/About/Government-Relations/Federal-Relations/Overview/.*

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.

American Recovery and Reinvestment Act 2009

The $789 billion economic stimulus package provides $27.5 billion to modernize roads and bridges and includes a three percent set aside of each state's share of the $27.5 billion for the Transportation Enhancements Program. At least half of the funds must be obligated by states within 120 days, or the U.S. Secretary of Transportation can recall up to 50 percent of the unobligated funds.

Also included is $8.4 billion to increase public transportation and improve transit facilities; $8 billion for investment in high speed rail and $1.5 billion for a discretionary surface transportation grant program to be awarded competitively by the Secretary of Transportation.

The Federal Highway Administration (FHWA) and Federal Transit Administration have issued guidance to assist state and local agencies in preparing for implementation of the stimulus bill. The guidance includes Q&As and actions that can be taken to expedite economic recovery projects.

Other Bicycle Infrastructure Funding Options

Additionally, States received a one time appropriation of $53.6 billion in state fiscal stabilization funding under 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

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

iii) 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.

State Highway Account

Section 157.4 of the Streets and Highways Code requires Caltrans to set aside $360,000 for the construction of nonmotorized 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.

Transportation Development Act Article III (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 Orange 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 19: Federal Funding Sources

Grant Source	Annual Total	Agency	Funding Cycle	Match	Remarks
Land and Water Conservation Act of 1965		CA Dept of Parks and Rec	December	50%	Funding subject to North/South split. (60% for Southern California) Funds outdoor recreation projects
MAP-21 - Surface Transportation Program (STP)		FHWA/Caltrans	June 1	20%	STP funds may be exchanged for local funds for non-federally certified local agencies. No match required if project improves safety
MAP-21 - Transportation Alternatives (TA)		FHWA/Caltrans	Annual	TBD	Funds recreational trails, Safe Routes to School and Transportation Enhancement projects
MAP-21 - TA - Recreational Trails	$5.3M in 2013	FHWA/CA Dept. of Parks and Rec	Annual	TBD	No longer a separate program, now falls under Transportation Alternatives.
MAP-21 - National Highway Performance Program		FHWA/Caltrans		20%	Bicycle projects must provide a high degree of safety
MAP-21 - Highway Safety Improvement Program		FHWA/Caltrans		10%	Bicycle projects must provide a high degree of safety
MAP-21 - Congestion Mitigation and Air Quality (CMAQ)		FHWA/Caltrans	April	20%	The amount of CMAQ Funds depends on the state's population share and on the degree of air pollution
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	$3M	Department of Energy			Provided formula funding for cities, counties and states to take part in energy efficient activities
Community Development Block Grants (CDBG)	$3M	HUD & CA Dept of Housing & Com. Dvpmt.	Ongoing	10%	Funds improve land use and transportation infrastructure in low-income neighborhoods or citywide for accessibility improvements.
Federal Lands Highway Program	$611M 2008-10	FLH/FHWA	Ongoing	Varies	May be used to build bicycle and pedestrian facilities in conjunction with roads and parkways at the discretion of the grantee
Land and Water Conservation Fund (LWCF)	$30M in 2010	NPS/California Department of Parks and Recreation	Annual	50%	LWCF grants may be used for outdoor recreational planning and for acquiring and developing recreational parks and facilities, especially in urban areas.
Sustainable Communities Regional Planning Grants	$68M	HUD	Annually	20%	Funding for preparing or implementing regional plans for sustainable development
American Recovery and Reinvestment Act of 2009 (ARRA)	$73 M in CA for 2010	FHWA	Ongoing		*http://www.recovery.gov*

Table 20: State Funding Sources					
Grant Source	**Annual Total**	**Agency**	**Funding Cycle**	**Match**	**Remarks**
State Highway Account (SHA): Bicycle Transportation Account (BTA)	$7.2M/yr. state-wide	Caltrans	March application deadline. Consult Local Assistance Office	10%	Must have an adopted Bicycle Transportation Plan. Funding available for all phases of projects
Transportation Development Act (TDA) Section 99234		OCTA	Annually	None	2% of TDA total, funds for bicycle and ped projects
AB 2766 Vehicle Registration Funds	$30M 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. $200M/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)	$10M/yr. state-wide	State Resources Agency	October annually	None required, but favored	Individual grants limited to $350K.

Table 20: State Funding 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	$3M annually	Caltrans	November	20%	Projects must have a transportation component or objective
Habitat Conservation Fund Grant Program (HCF)	$2M	CA Dept of Park and Recreation	October	50%	Sunsets 1 July 2020
Office of Traffic Safety Program (OTS)	Varies	Office of Traffic Safety	January	None	Goal to reduce vehicle fatalities and injuries through a safety program to include: education, enforcement and engineering
Safe Routes to School Program (SR2S)	$24M in 2009*	Caltrans	April	10%	Eligible for projects in vicinity of schools 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			The CCC provides emergency assistance & public service conservation work.
Environmental Justice (EJ) Planning Grants	$9M 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, cycling and/or equestrian activities compatible with other conservation objectives

Table 21: Local Funding Sources

Grant Source	Annual Total	Agency	Funding Cycle	Match	Remarks
Transportation Development Act (TDA)		OCTA	Annual (March)	None	TDA funds originate from a statewide sales tax of one quarter cent for transportation projects, which includes two percent for pedestrian and bicycle facilities.
Parking Meter Districts		City	Annual Budget	N/A	Parking Meter Districts can use parking meter revenues for streetscape improvements such as ped facilities, land-scaping & lighting.
Bicycle Corridor Improvement Program (BCI)	$4.5M in 2012	OCTA	Annual Budget	12% minimum	Eligible projects include: provision of bicycle facilities, recreation trails and facilities and safety/outreach programs.
Transient Occupancy Tax (TOT)		City	Annual Budget	None	Created to cover expenses and improvements related to tour-ism and to encourage more tourists to visit. This fund may be appropriate in areas where heavy tourism exists such as along the waterfront, major parks and historic neighbor-hoods.
Measure M2 Turnback	36.4M in 2009	OCTA	Annual Budget	None	For streets and roadway im-provements, including bicycle and pedestrian facilities.

Table 22: Private Funding 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 the areas of environment, community revitalization, effective citizenry, the 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	$54M annually	Kaiser Permanente	Ongoing	None	Numerous programs supporting 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 type of project	Ongoing		Corporate or individual donations, sponsorships, merchandising or special events.
In-kind Services		Depends on type of project	Ongoing		Donated labor and materials for facility construction or maintenance such as tree planting programs or trail construction and maintenance.

Appendices

A: Design Guidelines
B: Suitability Model and Project Prioritization
C: Community Input Summary
D: Bicycle Count Location Recommendations
E: City of Huntington Beach Municipal Code Bicycle Sections
F: 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 Multiple Use Paths – 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 and closed off from public areas, resulting in the misconception of increased crime or an unsafe environment.

Roadside obstacles – Roadside 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

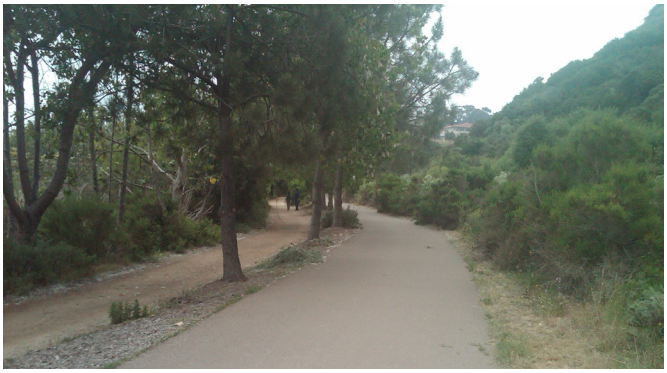
Shared Use Issues of Class 1 Facilities

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 Multiple Use of Paths

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.



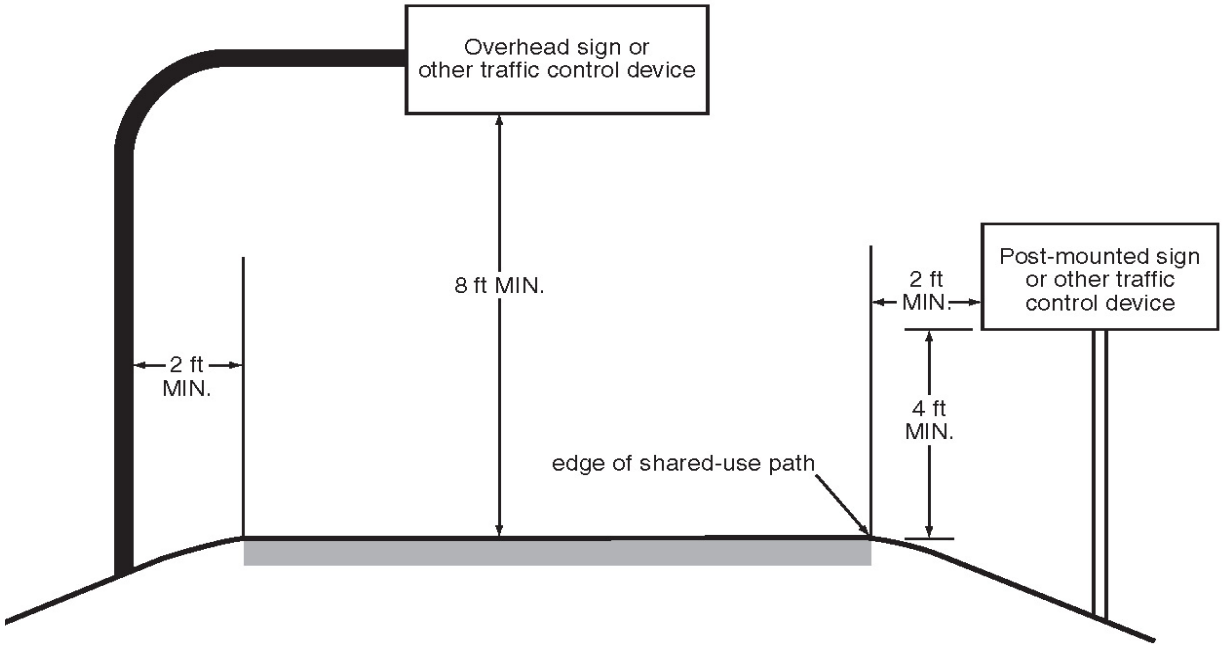
Class 1 multi-use path and adjacent horse trail - San Diego, CA

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.

Roadside 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, a 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 vacuumming.

Sign R81 (CA MUTCD)

Sign R81-A (CA MUTCD)

Sign R81-B (CA MUTCD)

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.

Class 2 Bicycle Lanes

The following are typical guidelines, as well as enhanced treatments, for installing bicycle lanes. Other treatments not listed in these guidelines can be considered on a case-by-case basis where warranted.

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.

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

References

Caltrans HDM Chapter 300, California MUTCD 2012

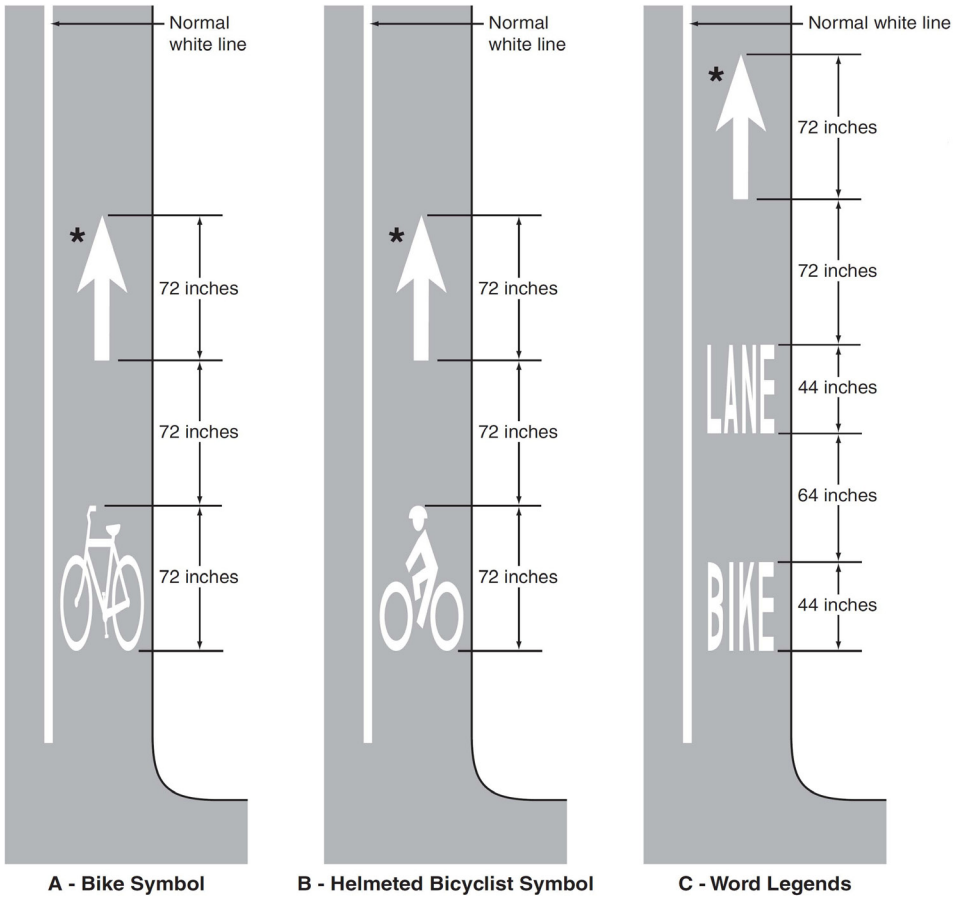
NACTO Urban Bikeway Design Guide, 2012

Model Design Manual of Living Streets, 2011

Existing bicycle lane on Pacific Coast Highway - Huntington Beach, CA

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)*

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 a 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, road 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 area - Columbia, MO (Source: APBP)

Buffered Bicycle Lanes

These buffers are the space between the bicycle lane and traffic lane, parking lane or both. Provides a more protected and comfortable space for cyclists than a conventional bicycle lane.

Design Guidelines

- Signage and dimensional guidelines are the same as for Class 2 bicycle lanes.
- Provide an additional 2-4 foot buffer or "shy zone" between the bicycle lane and traffic lane and/or parking lane.
- Line closest to bicycle lane should 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.

Recommendations

- Add diagonal striping on the outer buffer adjacent to the traffic 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

Buffered bicycle lane - Huntington Beach, CA

Back-in Diagonal Parking

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

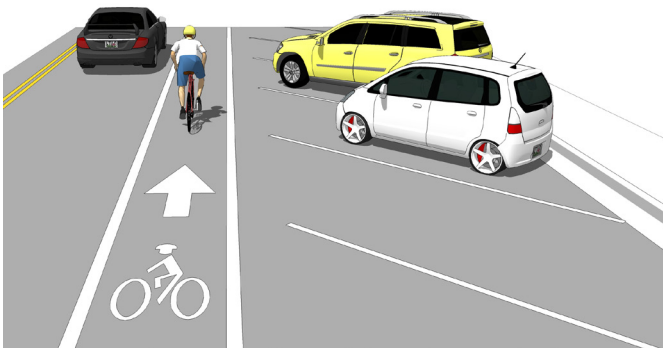
Back-in/Head-out Angle Parking, Nelson/Nygaard Consulting Associates, 2005

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

This design treatment is not currently present in any State or Federal design standards. It is now a standard configuration in Seattle, WA.

Instructional signage - Solana Beach, CA

Back-in/head-out angle parking - San Clemente, 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 cyclists are allowed. 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 requires 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 road users that cyclists may occupy the travel lane.

A Shared Lane Markings (SLM) 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.

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

Sign R4-11 (CA MUTCD)

Share the Road sign - San Clemente, CA

Enhanced Class 3 Bicycle Routes

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 place SLMs in the center of the rightmost travel lane.)

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

Recommendations

Shared lane markings should be paired with the Bicycles May use Full Lane Signs (R4-11).

Further enhancements such as a green striped lane throughout the Shared Lane Marking is another enhancement being used in cities such as Long Beach and Salt Lake City.

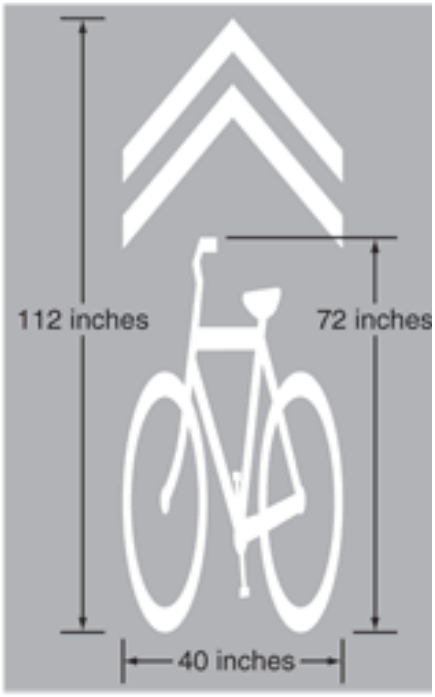
References

Caltrans HDM Chapter 300

California MUTCD 2012

NACTO Urban Bikeway Design Guide, 2012

Model Design Manual of Living Streets, 2011



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

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

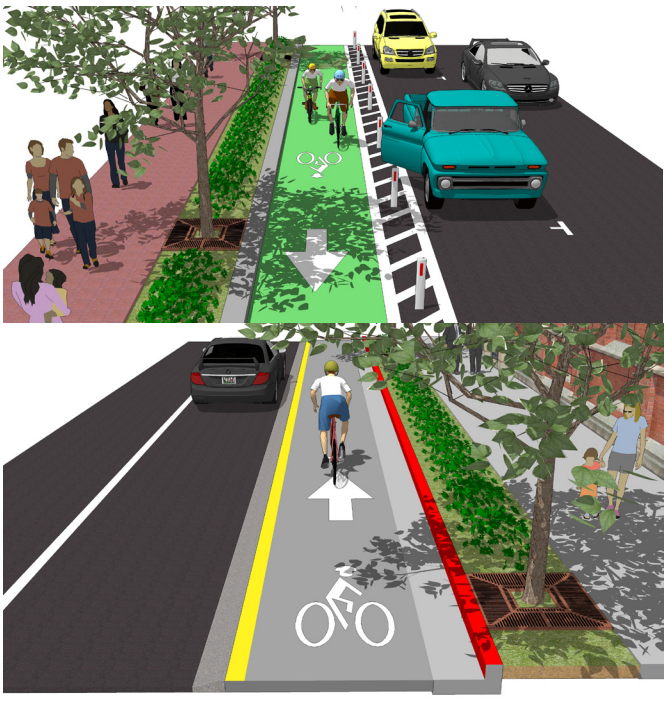
Shared lane marking - Oceanside, CA

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 midblock vehicular access points



Cycle track examples

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

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 - 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 "Bike Boulevard" signage along route.
- Increased pavement markings and/or unique pavement markings such as colored bicycle lanes, Shared Lane Markings ("Sharrows") or "Bike 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 intersection treatment - San Luis Obispo, CA

Bicycle boulevard pavement symbols - San Luis Obispo, CA

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

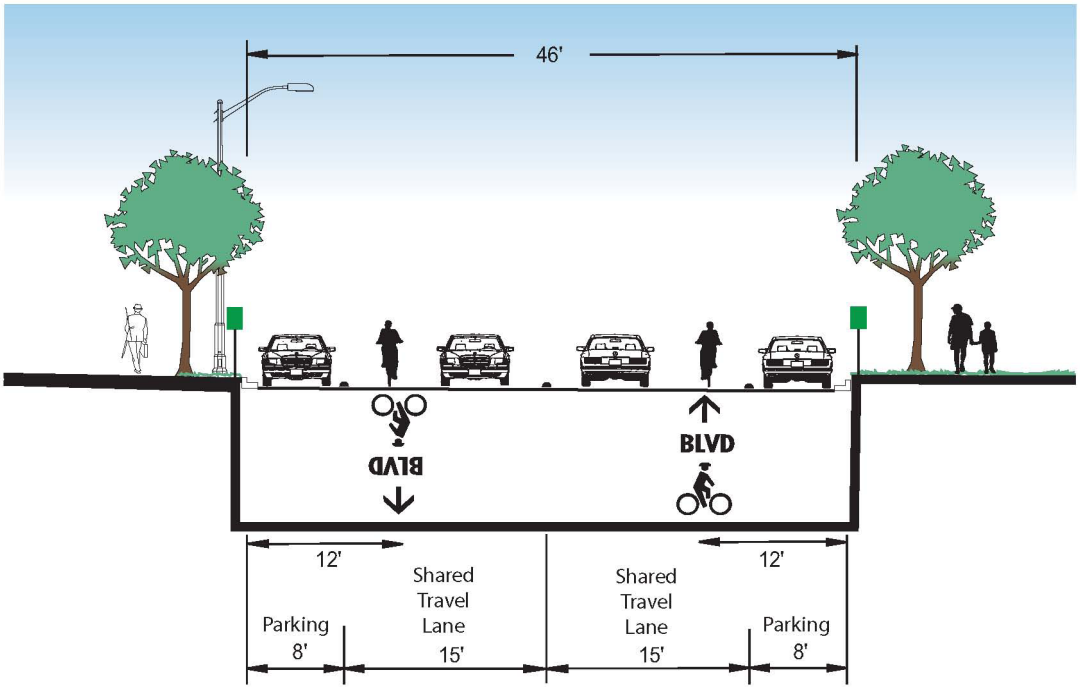
- Sharrows or Bike Boulevard pavement markings
- Traffic calming (curb extensions, roundabouts, street trees and speed tables) designed to increase pedestrian and bicycle safety
- Distinct and unique directional signage
- Traffic control devices for bicycles at major intersections
- Street trees and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

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 appears to be becoming the new bikeway color standard.



Cross section with bicycle boulevard pavement marking

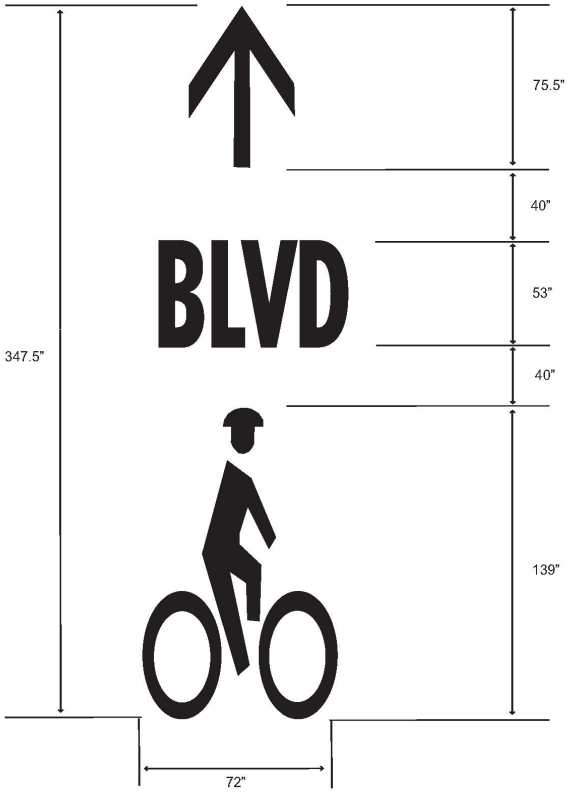
Bicycle boulevard pavement markings are car-sized white pavement markings that depict a bicycle, the abbreviation of "BLVD" and a directional arrow. These markings are to be applied directly to the road surface in the center of the drive lane with four to six inch wide white paint striping. Markings 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.

The bicycle boulevard symbol is not a standard symbol in the *CA MUTCD*. The diagram is the measurement based on the symbol used for bicycle boulevards in Berkeley, California. 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.

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 should be placed so cyclists who are properly positioned on the road 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.

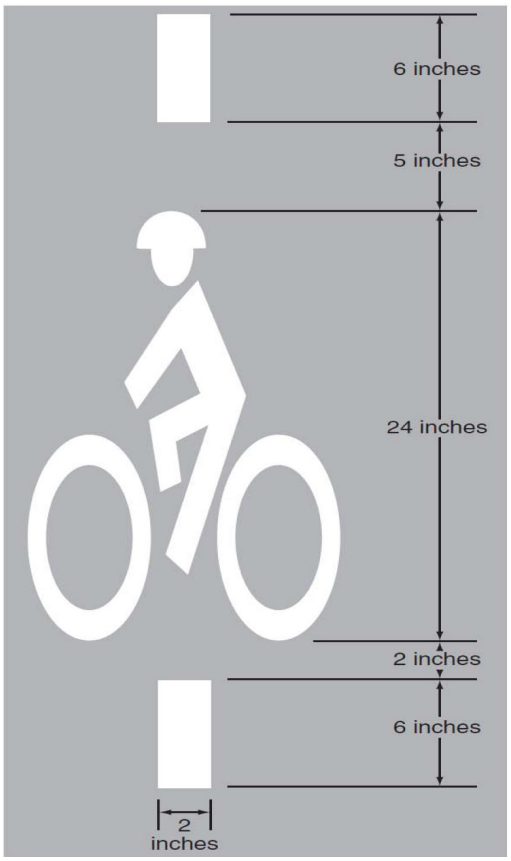
Where left turn lanes are provided and only protected left turns are allowed, bicycle sensitive loop detectors should be installed in the left turn lane. Where moderate or heavy volumes of bicycle traffic exist, or are anticipated, bicycles should be considered in the timing of the traffic signal cycle 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 bikes 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 crtieria 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.

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 bikes 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 bikes attached, such as with vandal-resistant fasteners.

Custom bicycle rack - Oceanside, CA

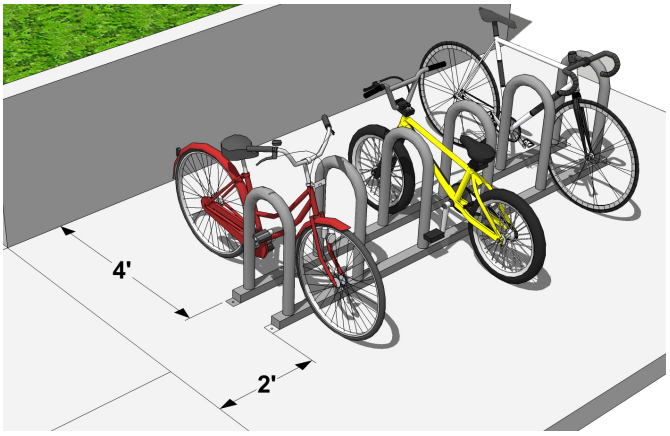
Custom bicycle rack - San Diego, CA

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.

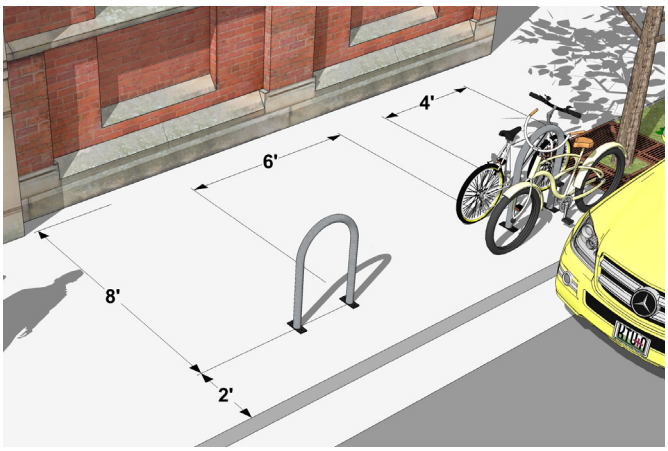
Rack Area

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.

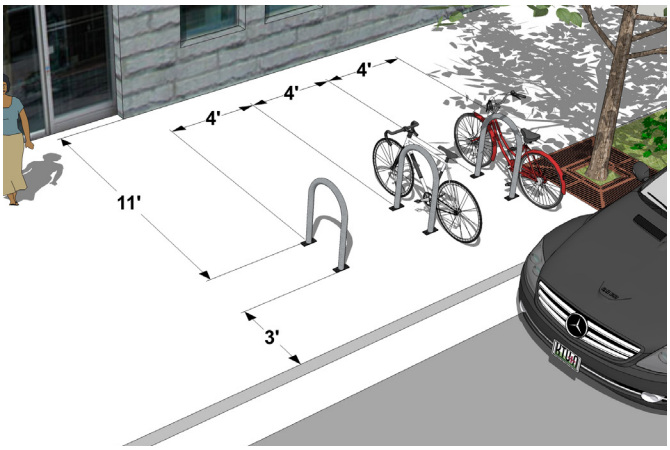
Large rack areas in high turnover areas should have more than one entrance. If possible, the rack area should be protected from the elements. Even though cyclists are exposed to sun, rain and snow while en route, covering the rack area keeps cyclists more comfortable while parking, locking their bicycles 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

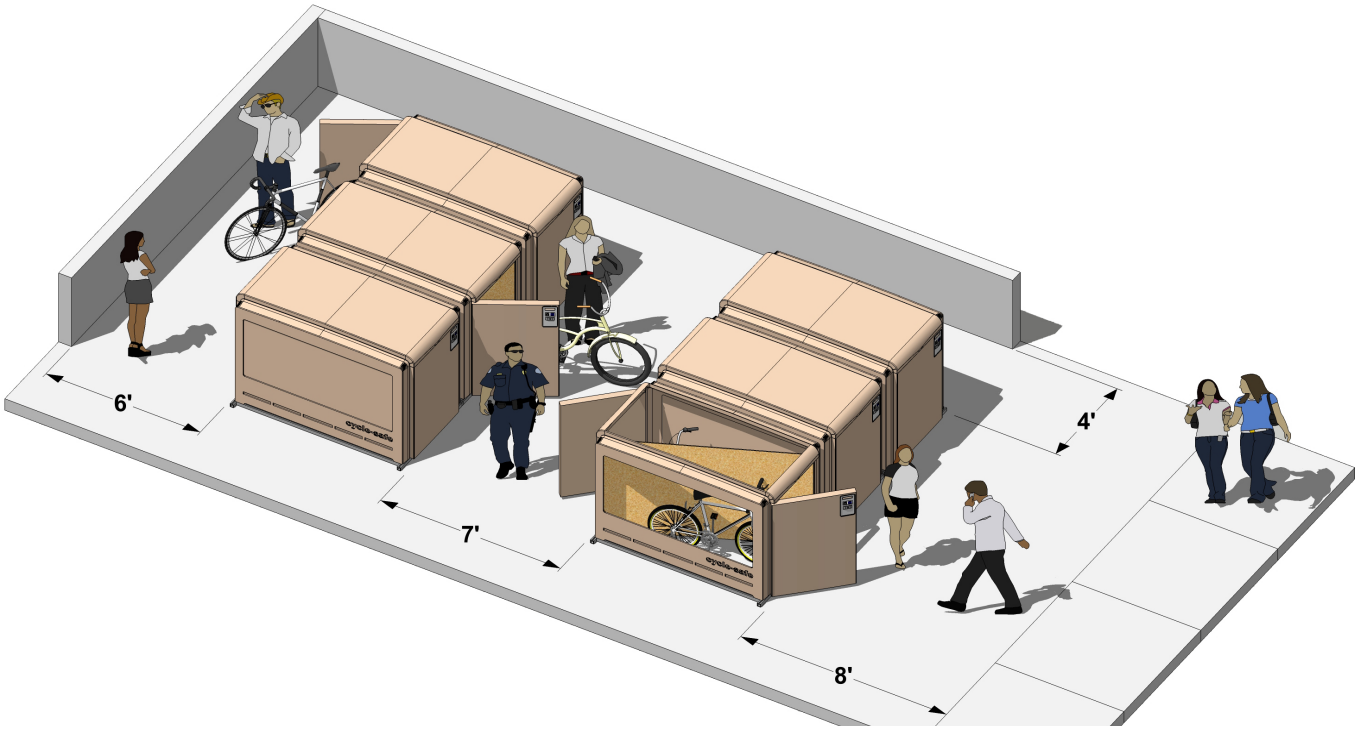
Bicycle corral dimensions - Converts one car parking space into 8-10 bicycle spaces

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 Huntington Beach 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. Some elementary school aged children walk or rely on their bicycle as a mode of transportation to get to school compared to high school kids who hold a drivers license.

Attractor Inputs

- Pier and Beaches
- 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 are more likely to walk or ride their bicycle to these areas. The model uses OCTA-defined traffic analysis zones (TAZs) citywide and 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 bikes. 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.

(Some of these criteria were based on the OCTA *4th District Bikeways Strategy* for countywide for consistency.)

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 *(Ex: Part of the OCTA Commuter Strategic Plan network, connections to adjacent City's bicycle facilities)*
- 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. Stakeholders 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: Public Input Summary

The following pages illustrate responses to the Bicycle Master Plan's online survey. An image capture of the survey opening page is shown below.

Huntington Beach Bike Plan

Project website for the Huntington Beach Bicycle Master Planning Process

Home About Bicycle Facilities **Survey**

Survey

Huntington Beach Bicycle Master Plan Survey

KTU+A is working with the City of Huntington Beach on a Bicycle Master Plan. Please take this survey to help us learn about bicycling in Huntington Beach.

What is your gender?

- ○ Male
- ○ Female
- ○ Prefer not to answer

What is your age?

- ○ 0-16 years old
- ○ 17-30
- ○ 31-40
- ○ 41-50
- ○ 51-60
- ○ > 60

What type of cyclist do you consider yourself?

- ○ Strong & Fearless (cyclists that will ride regardless of conditions)
- ○ Enthused & Confident (cautious cyclist)
- ○ Interested but Concerned (fear for safety is primary reason for not riding)
- ○ No Way No How (not likely use a bicycle for transportation)

Do you work in Huntington Beach

- ○ Yes
- ○ No

Are you a resident of Huntington Beach?

- ○ Yes
- ○ No

Search

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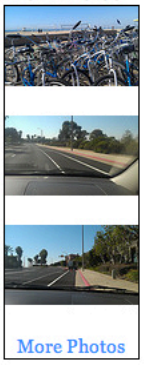
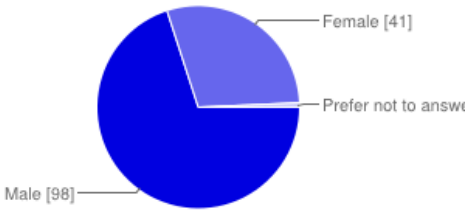


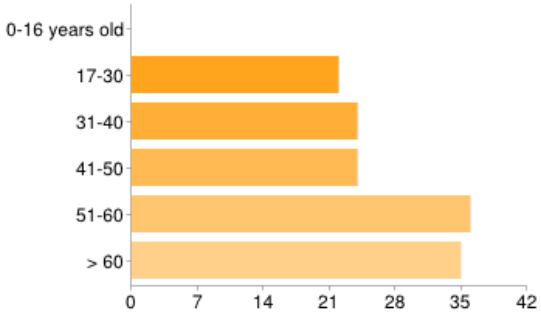
More Photos

What is your gender?



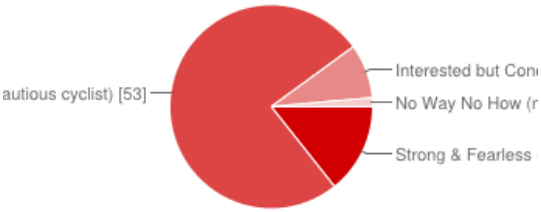
Male	**98**	69%
Female	**41**	29%
Prefer not to answer	**1**	1%

What is your age?



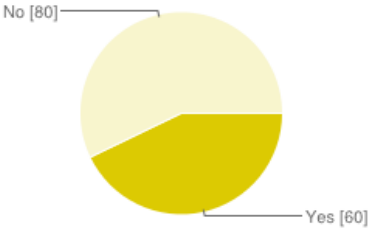
0-16 years old	**0**	0%
17-30	**22**	15%
31-40	**24**	17%
41-50	**24**	17%
51-60	**36**	25%
> 60	**35**	24%

What type of cyclist do you consider yourself?



Strong & Fearless (cyclists that will ride regardless of conditions)	**10**	7%
Enthused & Confident (cautious cyclist)	**53**	37%
Interested but Concerned (fear for safety is primary reason for not riding)	**6**	4%
No Way No How (not likely use a bicycle for transportation)	**1**	1%

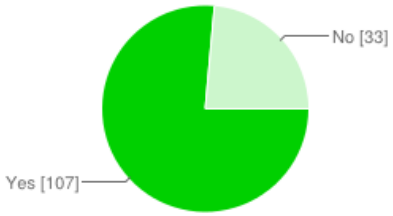
Do you work in Huntington Beach



Yes	**60**	42%
No	**80**	56%

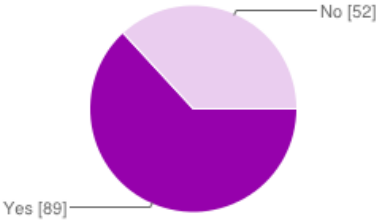
Appendix C: Public Input Summary

Are you a resident of Huntington Beach?



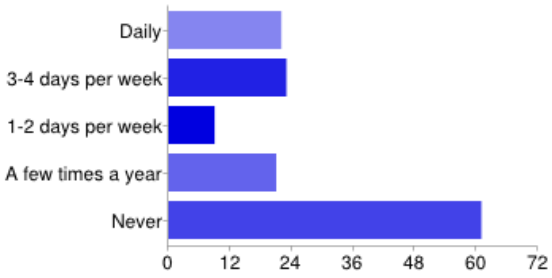
Yes	**107**	75%
No	**33**	23%

Do you currently ride your bike for running errands?



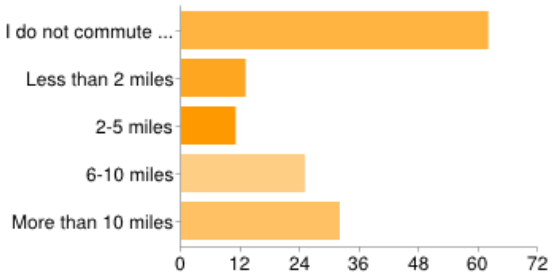
Yes	**89**	62%
No	**52**	36%

How often do you commute by bicycle to work?



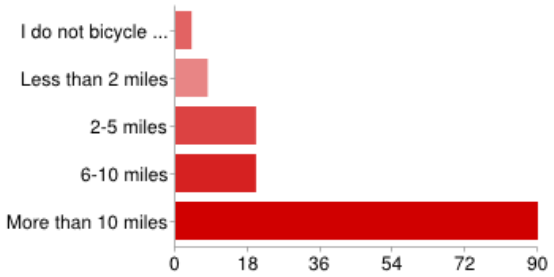
Daily	**22**	15%
3-4 days per week	**23**	16%
1-2 days per week	**9**	6%
A few times a year	**21**	15%
Never	**61**	43%

What is the distance of your commute round trip?



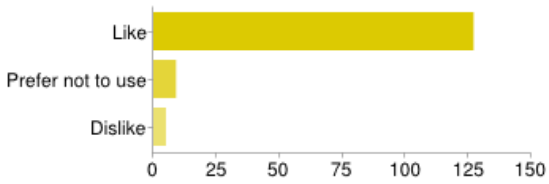
I do not commute by bicycle	**62**	43%
Less than 2 miles	**13**	9%
2-5 miles	**11**	8%
6-10 miles	**25**	17%
More than 10 miles	**32**	22%

How far do you ride your bike for fun or fitness?



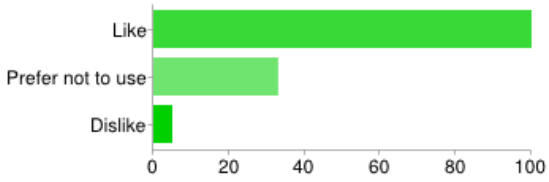
I do not bicycle for fun or fitness	**4**	3%
Less than 2 miles	**8**	6%
2-5 miles	**20**	14%
6-10 miles	**20**	14%
More than 10 miles	**90**	63%

Rank your preference of the following bicycle facilities - Bike Paths (separated from the road and traffic, ex. Huntington Beach Bike Path)



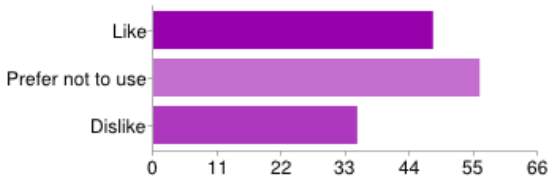
Like	**127**	89%
Prefer not to use	**9**	6%
Dislike	**5**	3%

Rank your preference of the following bicycle facilities - Bike Lanes (separated by roadway striping, ex. Magnolia, Gothard, Bushard)



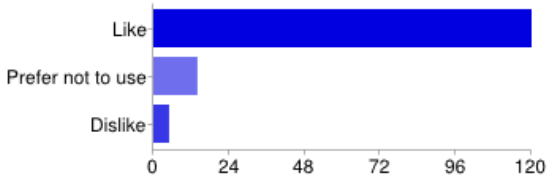
Like	**100**	70%
Prefer not to use	**33**	23%
Dislike	**5**	3%

Rank your preference of the following bicycle facilities - Bike Routes (shared roadway, ex. Portions of Pacific Coast Highway)



Like	**48**	34%
Prefer not to use	**56**	39%
Dislike	**35**	24%

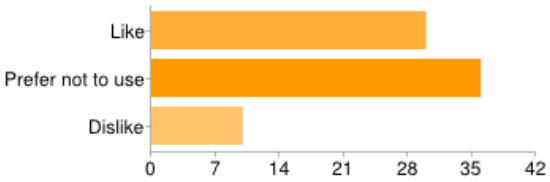
Rank your preference of the following bicycle facilities - Bicycle Boulevards (low volume streets optomized for easy bicycle travel)



Like	**120**	84%
Prefer not to use	**14**	10%
Dislike	**5**	3%

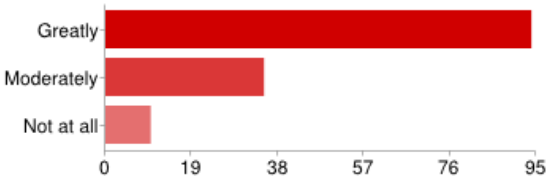
Appendix C: Public Input Summary

Rank your preference of the following bicycle facilities - Shared lanes marked with Sharrows



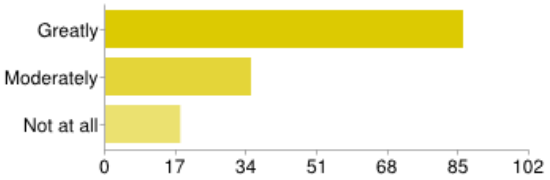
Like	**30**	21%
Prefer not to use	**36**	25%
Dislike	**10**	7%

How would the improvements listed below affect your decision to bicycle more? - Fix unfriendly intersection that have high speed merge lanes



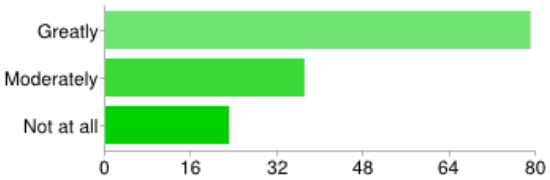
Greatly	**94**	66%
Moderately	**35**	24%
Not at all	**10**	7%

How would the improvements listed below affect your decision to bicycle more? - Improve public education for motorists with an emphasis on sharing roads with cyclists



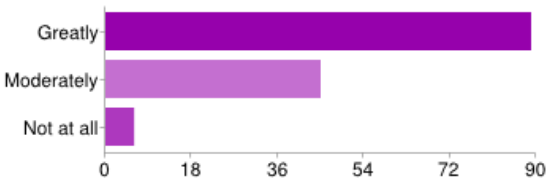
Greatly	**86**	60%
Moderately	**35**	24%
Not at all	**18**	13%

How would the improvements listed below affect your decision to bicycle more? - Improve public education for cyclists about obeying the rules of the road and riding safely



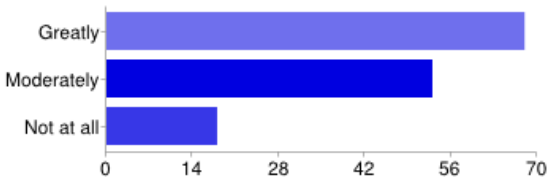
Greatly	**79**	55%
Moderately	**37**	26%
Not at all	**23**	16%

How would the improvements listed below affect your decision to bicycle more? - Improve bicycle access to schools, parks and local attractions



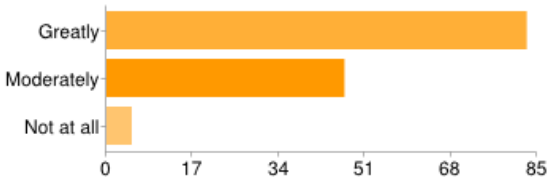
Greatly	**89**	62%
Moderately	**45**	31%
Not at all	**6**	4%

How would the improvements listed below affect your decision to bicycle more? - Improve enforcement of laws that apply to motorists and cyclists



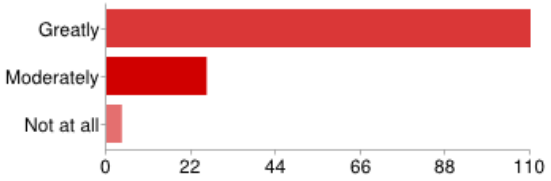
Greatly	**68**	48%
Moderately	**53**	37%
Not at all	**18**	13%

How would the improvements listed below affect your decision to bicycle more? - Improve intersection bike loop detection systems



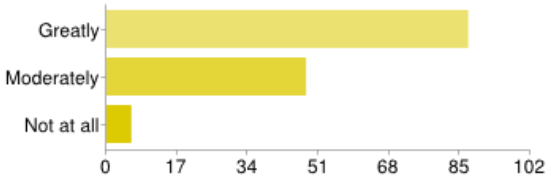
Greatly	**83**	58%
Moderately	**47**	33%
Not at all	**5**	3%

How would the improvements listed below affect your decision to bicycle more? - Create a more connected system by closing bicycle facility gaps



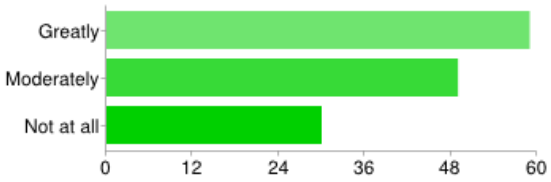
Greatly	**110**	77%
Moderately	**26**	18%
Not at all	**4**	3%

How would the improvements listed below affect your decision to bicycle more? - Provide more secure bicycle parking at major destinations and public facilities



Greatly	**87**	61%
Moderately	**48**	34%
Not at all	**6**	4%

How would the improvements listed below affect your decision to bicycle more? - Provide more bicycle events such as ciclovias, bicycle rodeos, city tours, etc



Greatly	**59**	41%
Moderately	**49**	34%
Not at all	**30**	21%

The **City of Huntington Beach** is developing it's first **Bicycle Master Plan** and we need your unique perspective!

Join us at our first **public meeting** and give us your thoughts on how to make Huntington Beach a more bike-friendly place. The bike planning consultants and City staff will be on hand to answer your questions and record your comments.

Where: Central Library - Talbert Room, 7111 Talbert Avenue
When: June 20, Wednesday, 6:00-8:00 p.m.

You can also help by filling out an **on-line survey** at:

http://huntingtonbeachbikeplan.com/

For more information, please contact the Public Works Department at (714) 536-5431. Thanks for contributing to the plan.

Appendix D: Bicycle Count Location Recommendations

Bicycle counts can help to determine and better understand cycling levels at locations citywide, to evaluate the impact of the development of new bicycle facilities, policies or programs, and to better understand collision data through the calculation of crash rates per cyclist. SCAG is currently developing a recommended bicycle count methodology for member jurisdictions and Huntington Beach should consider adopting this count methodology once it has been finalized.

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. Based on Huntington Beach's population, this would amount to approximately 13 count locations. Because of the City's relatively high bicycle use levels, its size in terms of land area, and a grid network of roadways that provides multiple parallel options, 24 locations were selected for on-going annual counts. NBPD recommends counting at least once per year, preferably in September.

#	Cross Street 1	Cross Street 2	Characteristics
1	Bolsa Chica St	Bolsa Ave	Existing lanes on Bolsa Ave and Bolsa Chica St s/o Bolsa Ave; Proposed lanes on Bolsa Chica St n/o Bolsa Ave
2	Edinger Ave	Springdale St	High collision location; Existing lanes on Edinger e/o Springdale; Existing lanes on Springdale n/o Edinger drop before intersection; Proposed lanes on Edinger w/o Springdale and on Springdale s/o Edinger.
3	Edinger Ave	Gothard St	Existing lanes on Gothard and Edinger w/o Gothard; Proposed bicycle lane on Edinger e/o Gothard
4	Bolsa Chica St	Heil Ave	High collision location; Existing lanes on Bolsa Chica; Existing lane/route on Heil; Proposed lane improvements on Heil
5	Warner Ave	Springdale St	Existing lanes on Warner and Springdale n/o Warner; Proposed lanes on Springdale s/o Warner.
6	Warner Ave	Gothard St	High collision location; Existing lanes on Warner and Gothard; Proposed paths parallel to both Warner and Gothard (within ~600 feet of each) may impact future ridership/ collisions.
7	Beach Blvd	Warner Ave	High collision location; Existing lanes on Warner; Proposed lanes on Beach
8	Pacific Coast Hwy	Warner Ave	Existing lane on Warner drops e/o PCH; Proposed lane on PCH
9	Beach Path	s/o Warner Ave	Existing path; Screenline (rather than intersection) counts collected along path just south of Warner
10	Beach Blvd	Talbert Ave	High collision location; Existing lanes on Talbert; Proposed lanes on Beach
11	Goldenwest St	Ellis Ave	Existing lanes on Goldenwest and Ellis e/o Goldenwest; proposed lanes on Ellis w/o Goldenwest
12	Beach Blvd	Indianapolis St	High collision location; Existing lanes on Indianapolis; Proposed lanes on Beach
13	Magnolia St	Yorktown Ave	High collision location; Existing lanes on Magnolia and Yorktown
14	Utica Ave	Lake St	Existing lanes on Lake St; Proposed bicycle boulevard on Utica Ave will facilitate bicycle through movement between Alabama St and Lake St
15	Adams Ave	Newland St	Existing lanes on Newland; Proposed lanes on Adams
16	Adams Ave	Brookhurst St	High collision location; No existing facilities; Proposed lanes on Adams
17	17th St	Palm Ave	Existing lanes on 17th and Palm n/o 17th; Proposed bicycle boulevard on Palm will reduce number of starts/stops for through cyclists
18	Main St	Orange Ave	No existing facilities on either street; Proposed route on Main; Proposed lanes on Orange
19	Magnolia St	Atlanta Ave	High collision location; Existing lanes on Magnolia and Atlanta
20	Beach Multi-use Path	Main St	Existing path; Screenline (rather than intersection) counts collected along path at Pier
21	Pacific Coast Hwy	1st Street	High collision location; Existing lanes on PCH and 1st; proposed lane/cycle track on PCH
22	Santa Ana River Trail	Edison ROW	Existing path along Santa Ana River; Proposed path along Edison ROW
23	Pacific Coast Hwy	Beach Blvd	Proposed lanes on PCH and Beach
24	Santa Ana River Trail	Beach Multi-use Path	Confluence of two existing paths. Screenline (rather than intersection) counts would be collected, where path goes under PCH. This will capture number of cyclists transitioning between two paths.

10.84.005 Definitions

For the purpose of this chapter, the following words and phrases are defined as follows:

(a) "Bicycle lane" is that portion of a roadway, other than state and county highways, set aside by striping for the use of bicycle riders and so designated, as provided in this chapter.

(b) "Bicycle path" is a pathway for bicycle riders that has been physically separated from a roadway.

(c) "Bicycle" is a device upon which any person may ride, propelled exclusively by human power through a system of belts, chains, or gears, and having either two or three wheels in a tandem or tricycle arrangement.

(d) "Highway" is a way or place of whatever nature, maintained and open to the use of the public for purposes of vehicular travel. Highway includes street.

(e) "Roadway" is that portion of a highway improved, designed, or ordinarily used for vehicular travel.

(f) "Chief of Police" shall include his designated representative. (1913-5/74, 1969-4/75, 2059-6/76, 2175-4/77)

(g) "Motorized Scooter" shall have the same definition as that of California Vehicle Code §407.5(a). (3458-5/00)

10.84.080 Dealer's records.

Every person engaged in the business of buying, trading, or selling bicycles in this city shall keep at his place of business a record of all bicycles, bought, sold or rented by him, giving the date of such transaction, the name and address of the person from whom purchased or traded, or to whom sold or rented, a description of such bicycle by name and make, and the frame or serial number. Such record shall be maintained in a plain, legible handwriting in a bound book, which record shall be available for inspection by members of the Police Department at all reasonable times. Such person shall make a written report to the Police Department, giving the name, address and telephone number of all persons buying, selling or trading bicycles at his place of business, and the bicycle manufacturer, type, and frame number. (432-1/40, 1784-12/72, 1969-4/75, 3602-5/03)

10.84.120 Impounding

Parked bicycles. No person shall park or leave a bicycle in the area between Pacific Coast Highway and the mean high tide line of the Pacific Ocean in a manner so as to block or impede any road, vehicle route, walkway or path, or so as to block or impede ingress or egress from any building, stair, pier or bridge. Any bicycle so parked or left may be impounded by the Community Services Department or by the Police Department, and may be held until the sum of five dollars ($5) has been collected to defray the cost of impound. (1784-12/72, 1913-5/74)

10.84.130 Impounding

Holding time period. Any bicycle which has been so impounded and held for three (3) months without redemption by or on behalf of the lawful owner thereof shall, if saleable, be sold at such time and place and in such manner for the reasonable value thereof, as provided by this code. (1784-12/72, 1913-5/74, 3602-5/03)

10.84.160 Riding on sidewalk

No person shall ride a bicycle upon a sidewalk within any business district, or upon the sidewalk adjacent to any public school building, church, recreation center, playground or over any pedestrian overcrossing, or within any crosswalk. (22-8/09, 322-1/29, 1784-12/72, 1913-5/74, 2270-3/78)

10.84.170 Yielding right-of-way

Whenever any person is riding a bicycle upon a sidewalk, such person shall yield the right-of-way to any pedestrian, and when overtaking and passing a pedestrian shall give an audible signal. A person riding a bicycle off a sidewalk and onto a roadway shall yield to all traffic on the roadway. (22-8/09, 1913-5/74, 1784-12/72)

10.84.180 Riding in group

Persons operating bicycles on a bicycle lane or path shall not ride more than two (2) abreast. (1784-12/72, 1913-5/74)

10.84.200 Bicycles on pier

No person shall ride a bicycle or any similar type vehicle on the municipal pier. Bicycles or similar type vehicles may be walked or pushed on the pier. (344-10/31, 554-12/49, 1784-12/72, 1913-5/74, 3185-5/93)

10.84.210 Bicycle lanes and paths established

The City Council establishes those bicycle lanes and paths as designated on the Preliminary Plan; Trails Element to the Master Plan of the City of Huntington Beach, and as such Preliminary Plan; Trails Element to the Master Plan may be amended hereafter from time to time. (1784-12/72, 1913-5/74)

10.84.220 Implementing establishment of bicycle lanes and paths

The City Administrator is authorized, empowered and directed to implement the establishment of the bicycle lanes and paths, as designated on the Preliminary Plan; Trails Element to the Master Plan of the City of Huntington Beach, and as such Preliminary Plan; Trails Element to the Master Plan may be amended hereafter from time to time. (1913-5/74)

10.84.230 Bicycle lanes - Markings and signs

The Traffic Engineer is authorized to erect or place signs upon any street or adjacent to any street in the city indicating the existence of a bicycle lane or path, and otherwise regulating the operation and use of vehicles and bicycles with respect thereto. When such signs are in place, no person shall disobey same.

The bicycle lane shall be designated on such street by a six (6) inch wide reflectorized white line. (1913-5/74, 2175-4/77)

10.84.250 Direction of travel

No person shall ride or operate a bicycle within a bicycle lane or path in any direction except that permitted vehicular traffic traveling on the same side of the roadway; provided that bicycles may proceed either way along a lane or path where arrows appear on the surface of the lane designating two-way traffic. (1913-5/74)

10.84.260 Walking bicycles

Bicycles may be walked subject to all provisions of law applicable to pedestrians. (1913-5/74)

10.84.270 Vehicular traffic in bicycle lanes or paths

No person shall park a motor vehicle across or on a bicycle path or lane except to obtain emergency parking where signs are posted prohibiting such parking. No person shall drive a motor vehicle across a bicycle lane except after giving the right-of-way to all bicycles operated within the lane. No motor vehicle, motorized bicycle, motor-driven cycle, or motorcycle may be operated on a bicycle path or sidewalk. (1913-5/74, 2059-6/76, 2148-1/77, 2175-4/77)

10.84.275 Motorized scooter

For the purpose of this chapter, a motorized scooter shall be subject to each and every section that applies to bicycles. (3458-5/00)

10.84.280 Penalty

It shall be unlawful for any person knowingly to violate or knowingly to permit any other person to violate any of the provisions contained in sections 10.84.160 through 10.84.270 of this chapter, and any person violating any of the provisions contained in such sections shall be guilty of an infraction and punished upon a first conviction by a fine not exceeding fifty dollars ($50) and for a second or any subsequent conviction within a period of one year, by a fine not exceeding one hundred dollars ($100). (1913-5/74, 2059-6/76)

BTA Compliance

For reviewer convenience, code text and associated document sections 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.

As the City's first bicycle transportation plan, this document recommends establishing a cycling activity baseline, and therefore includes suggested annual count locations shown in Appendix D.

(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 3 maps and tables, particularly Figure 10.

(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 Figures 5-9.

(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.

Officers assigned to the downtown foot beat enforce the "No Bikes on Sidewalks" ordinance, which is intended to mitigate conflicts in this very high pedestrian and bicycle traffic area. Also, the two officer instructors for the diversion program are available to provide bicycle safety presentations upon request. Department-wide training regarding bicycle enforcement is conducted on as-needed basis.

(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 2.6: Opportunities and Constraints Summary, Community Input.

(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, but particularly Section 2.4: Origins and Destinations and Section 3.3: Recommended Programs, under encouragement and equity.

(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.

In September 2012, the City was awarded $192,330, combined with a $64,110 City match, for the Edinger Avenue Class 1 Path.

Other expenditures have included approximately $4,000 per year on bicycle facility maintenance.