Chapter 7

Manhattan Beach

7 Manhattan Beach

This chapter presents Manhattan Beach's portion of the South Bay Bicycle Master Plan. It begins with a discussion of how Manhattan Beach complies with Bicycle Transportation Account requirements. The chapter is then organized into the following sections:

- Existing conditions;
- City-specific goals, policies, and implementation actions;
- Needs analysis;
- Proposed bicycle network;
- Project prioritization; and
- Project costs.

7.1 Bicycle Transportation Account (BTA) Compliance

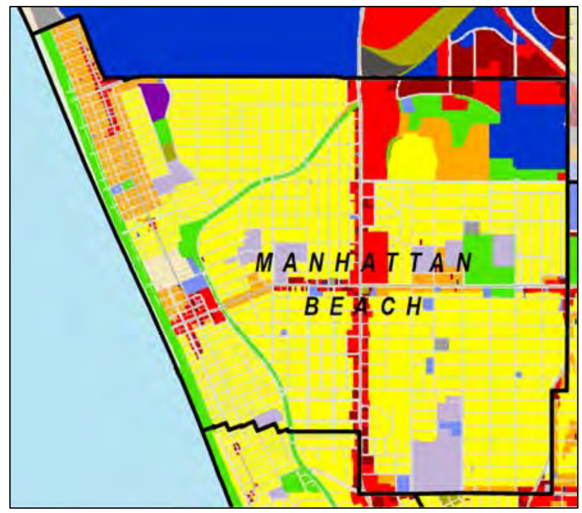
The Bicycle Transportation Account (BTA) is an annual statewide discretionary program that funds bicycle projects through the Caltrans Bicycle Facility Unit. Available as grants to local jurisdictions, the program emphasizes projects that benefit bicycling for commuting purposes. In order for Manhattan Beach to qualify for BTA funds, the South Bay Bicycle Master Plan must contain specific elements. **Appendix E** displays the requisite BTA components and their location within this plan. The table includes "Approved" and "Notes/Comments" columns for the convenience of the Metro official responsible for reviewing compliance.

7.2 Existing Conditions

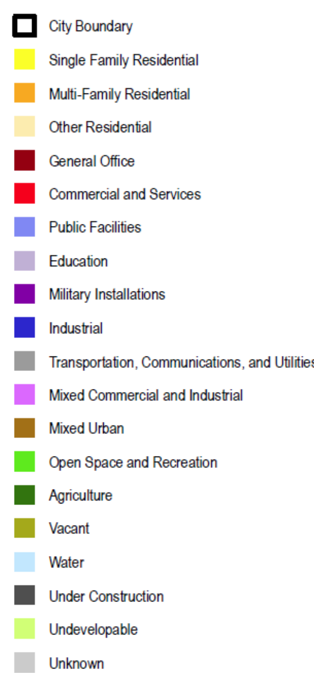
Manhattan Beach is located in the western portion of the South Bay region. It is bordered by the City of El Segundo to the north, the City of Redondo Beach to the east, the City of Hermosa Beach to the south, and the Pacific Ocean to the west. According to the 2000 Census, Manhattan Beach has a population of 34,039. The city was incorporated in 1912.

7.2.1 Land Use

Appendix A-3 displays a map of the existing land uses in the South Bay Region. Land uses in Manhattan Beach are shown at right. Almost 70 percent of the land area in Manhattan Beach is devoted to residential uses: approximately 60 percent is single family and about 8 percent is multi-family. Manhattan Beach is also approximately 10 percent open space.



Existing Land Uses in Manhattan Beach
(See Appendix A-3 for larger map)



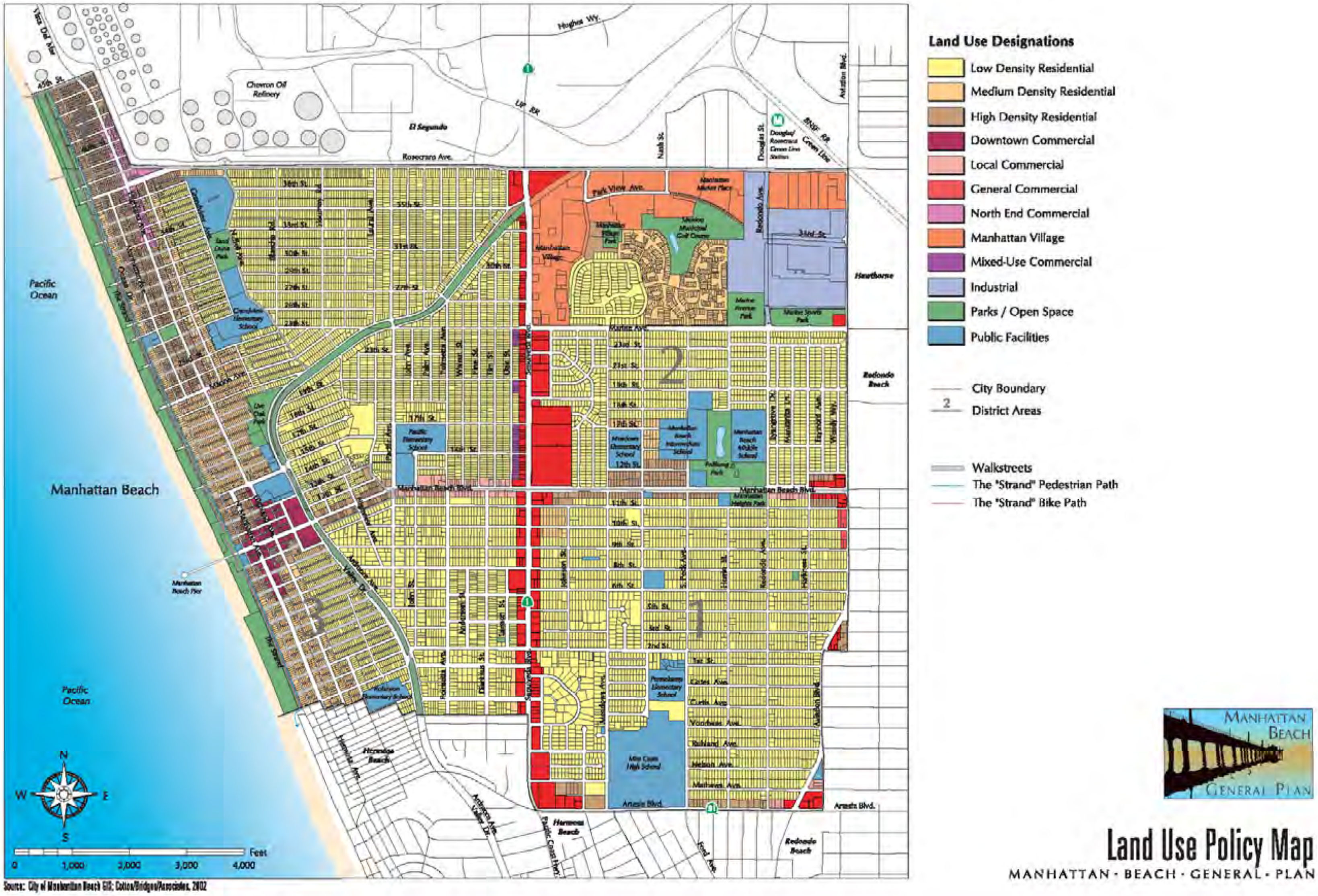


Figure 7-1: City of Manhattan Beach Land Use Policy Map

South Bay Bicycle Master Plan

Source: City of Manhattan Beach (2003)

displays the proposed land uses in Manhattan Beach. As compared to the existing uses, the City plans to increase residential densities from single-family to multi-family South of Marine Avenue and west of Valley Drive, as well as south of the pier between Valley Drive and the Strand.

7.2.2 Bicycle Trip Generators

Bicycle trip generators refer to population characteristics that are correlated with higher bicycling activity levels, such as high population or employment densities or high concentrations of certain sub-populations, such as transit commuters or zero-vehicle households.

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Appendix A-4 shows population density in Manhattan Beach. The areas with the highest population densities are located along the beach, which is where much of the multi-family housing is located. This has the potential to generate bicycle trips as housing is nearby the downtown and many key community services. Population density, measured as the number of persons per acre, is a strong indicator of potential bicycle activity, because more people living in an area implies more trips to and from that area. The high population densities of urbanized environments also tend to support bicycle travel through mixed land uses, interconnected street networks, and shorter trip lengths.

Appendix A-5 displays employment density in Manhattan Beach. Employment is most dense along Sepulveda Boulevard, on the northeast portion of Rosecrans Avenue, and around the intersection of Highland Avenue and Manhattan Beach Boulevard. Both Sepulveda Boulevard and the intersection of Highland Avenue and Manhattan Beach Boulevard primarily support commercial and service land uses. Rosecrans Avenue has commercial and service uses, as well as industrial and general office space. These sites have the potential to generate bicycle activity, as they are located in environments with a variety of land uses where trips between uses can be shorter.

Appendix A-6, Appendix A-6, and **Appendix A-8** display the percent of zero-vehicle households, median annual income, and percent transit commuters by census tract in the City of Manhattan Beach. Manhattan Beach overall has low percentages of transit commuters and high median annual incomes. Most households make above $95,000 per year (in 1999 dollars). Manhattan Beach also has high rates of vehicle ownership. Households without vehicles are concentrated in the southwest and central (Tree

Section) portions of the city. These parts of the city have greater potential for increased bicycling activity because residents who do not have vehicles must use alternative modes and are likely to combine bicycle and transit trips.

In addition to the reasons discussed above, Manhattan Beach has the potential for increased bicycle activity from bicyclists passing through on their way to destinations outside of the city. A bicycle network that is connected within Manhattan Beach, as well as linked to bicycle facilities in adjacent communities, further generates bicycle traffic as it provides a viable transportation option to driving a motorized vehicle.

7.2.3 Relevant Plans and Policies

Table 7-1 outlines information regarding bicycles from the City of Manhattan Beach's Infrastructure Element, Municipal Code, and Suggested Safe Routes to School Maps.

Table 7-1: Manhattan Beach Bicycle-Related Plans and Policies

Document	Description
General Plan Infrastructure Element (2003)	This element contains a map of existing bikeways in the City (**Appendix F-4**), which include the Strand Bikeway and Veterans Parkway, which is a multi-use trail. The element also includes goals and policies relevant to bicycling, which are: • Work with the school district and private schools to improve pedestrian and bicycle safety around schools • Incorporate bikeways and pedestrian ways as part of the City's circulation system • Encourage features that accommodate the use of bicycles in the design of new development • Encourage the development of recreational bicycle routes to link residential, schools, and recreational areas east of Sepulveda Boulevard with the Strand bike path
Municipal Code	The City's Municipal Code prohibits riding bicycles on the sidewalk, except for children under 14 years old in front of schools, stores, or buildings used for business purposes. The Municipal Code provides bicycle requirements based on land use type. Parking must be in the form of a stationary object (either a freestanding bicycle rack or a wall-mounted bracket) to which a user can secure both wheels and the frame of a bicycle with a user-provided six-foot cable and lock. Before installation, the City reviews the design and location of bicycle parking through a Use Permit to ensure design compatibility with the architecture, appropriate materials, safety, and that it does not block pedestrian or vehicle paths-access. The City conducted a comprehensive bikeway study in 2009 to evaluate the needs, wants and opportunities related to bicycles. The study found that most people in the community utilize bikeways for recreation purposes rather than for commuting to and from work. Bicycle parking policies do not reflect that as they focus on providing facilities at commercial rather than recreational sites.

Document	Description
Suggested Routes to School Maps	In August of 2009, the City was awarded Safe Routes to School (SR2S) funding by the State of California. These maps are part of Manhattan Beach's larger SR2S effort. They display suggested routes for walking/biking to Meadows, Grand View, Pennekamp, Pacific, and Robinson Elementary Schools. They also highlight where traffic signals, walkstreets (streets closed to vehicular traffic), crosswalks, and crossing guards are located. Detailed bicycle parking information is presented in **Appendix G**.

7.2.4 Existing Bicycle Network

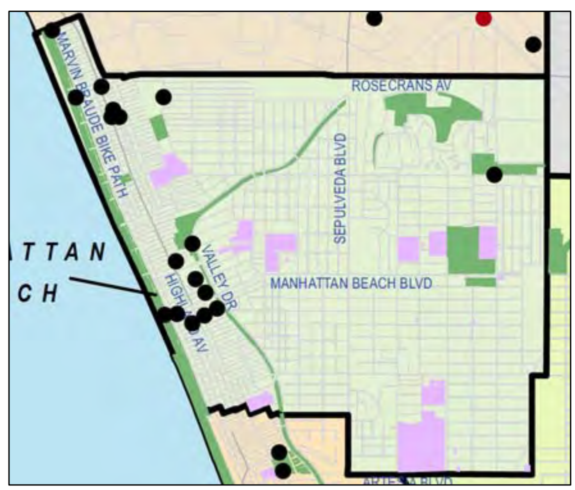
Figure 7-1 shows the existing bicycle facilities in Manhattan Beach. **Appendix A-2** displays a map of the existing bicycle facilities in the South Bay Region. Bicycle facility types are discussed in **Section 1.3**. The bicycle network in the City of Manhattan Beach consists of approximately 3 miles of bikeways. This includes a section of the Los Angeles County-maintained Class I bicycle path on the Strand and Class III bicycle routes. **Table 7-2** summarizes the classification and mileage of the existing network.

Table 7-2: Manhattan Beach Bicycle Network

Facility Type	Mileage
Class I (Bike Path)	2.1
Class II (Bike Lanes)	0.0
Class III (Bike Route)	1.1
Total Mileage	**3.2**

7.2.5 Existing End-of-Trip Parking Facilities

The BTA requires that this plan inventory publicly-accessible short-term and long-term end-of-trip bicycle facilities for the members of the bicycling public to park their bicycles, as well as change and store clothes and equipment. Short-term facilities consist of bicycle racks. Long-term facilities include, but are not limited to, locker, restroom, and shower facilities near bicycle parking facilities. **Appendix A-9** displays the existing end-of-trip bicycle facilities in the South Bay. The locations of existing bicycle racks in Manhattan Beach are shown at right. These locations include parks, on sidewalks, and at the beach. Bicycle racks in Manhattan Beach include comb racks, wave racks, and several styles of artistic racks. The City does not provide any long-term bicycle parking within its jurisdiction.



Existing End-of-trip Facilities in Manhattan Beach

(See Appendix A-9 for larger map)

Existing Bike Racks
Existing Bike Lockers

Figure 7-2: Existing Bicycle Facilities in Manhattan Beach

South Bay Bicycle Master Plan
El Segundo - Gardena - Hermosa Beach - Lawndale - Manhattan Beach - Redondo Beach - Torrance

7.2.6 Multi-Modal Connections

Transit is often best for longer trips, while bicycling is better for shorter trips. Combining transit use and bicycling can offer a high level of mobility that is comparable to travel by automobile. **Appendix A-10** shows the existing Los Angeles Metropolitan Transit Authority (Metro) transit routes that serve the City of Manhattan Beach. Metro operates bus lines with routes on the City's major arterials, though the western half of Manhattan Beach is underserved. Buses are equipped with bicycle racks, which are available on a first-come, first-served basis.

Metro operates bus lines with routes on the City's major arterials.

LADOT operates the Commuter Express bus service. Line 438 connects the cities of El Segundo, Manhattan Beach, Hermosa Beach, Redondo Beach, and Torrance to Downtown Los Angeles. Most Commuter Express buses are equipped with bicycle racks, which are available on a first-come, first-served basis. **Appendix A-11** shows the Commuter Express Line bus routes.

Beach Cities Transit (BCT) Line 109, operated by the City of Redondo Beach, and Torrance Transit Line 8, operated by the City of Torrance, also serve the City of Manhattan Beach. **Appendix A-13** shows the BCT System Map and **Appendix A-14** shows the Torrance Transit System Map. Buses are equipped with bike racks, which are available on a first-come, first-served basis.

The BTA requires that this plan inventory existing bicycle transport and parking facilities for connecting to public transit services. These facilities include, but are not limited to, bicycle parking at transit stops, rail and transit terminals, park and ride lots, and provisions for transporting bicycles on public transit vehicles. Manhattan Beach does not currently provide any intermodal end-of-trip bicycle facilities within its jurisdiction.

7.2.7 Education and Enforcement Strategies

Bicycle education programs and enforcement of bicycle-related policies help to make riding safer for all bicyclists. To promote safe bicycling at the Middle School level, the City of Manhattan Beach provides bicycle education to the school, parents, and students through the School Resource Officer (SRO) and Crime Prevention Officer. Once per year, there is a Bicycle Rodeo at Manhattan Beach Middle School and the Police Department provides a presentation and information on bicycle safety, requirements, wearing helmets, and the use of lights and reflectors. Bicycle Rodeos are meant to ensure that children bicycling to school have the appropriate and required equipment, know where to ride, and follow the proper traffic signals, signs and markings. Throughout the school year, the SRO addresses students on campus regarding bicycle safety as needed.

There is not a SRO for the elementary schools in Manhattan Beach, so they utilize saturated enforcement with patrol and traffic officers adjacent to the schools. Officers check to make sure that children have the proper equipment when bicycling to school, and if they don't, they stop children to educate them and issue warnings. If a child receives several warnings, the officer will issue a citation, which requires the parent(s) to go to court.

In the rest of the City, enforcement is performed by patrol and traffic officers. Enforcement is focused in the Downtown and on the Bike Path during the summer months. Officers issue warnings and citations for observed violations. Whenever an officer stops someone, they also educate the person on bicycle safety and the rules of the road regardless of whether a warning or citation is issued.

7.2.8 Past Bicycle-Related Expenditures

Between 2005 and 2011, the City of Manhattan Beach incurred the following bicycle expenditures:

- $2,500 for bicycle racks and bicycle route signs
- $12,000 for labor, installation, core drilling, and concrete for new bicycle racks

The public identified major arterials as streets in need of bicycle facilities.

7.3 Needs Analysis

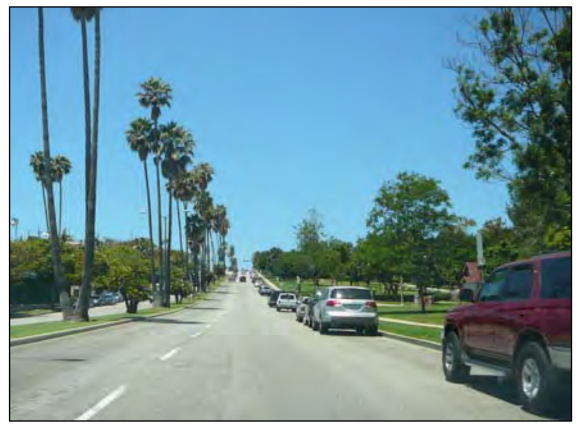
This section describes the needs of bicyclists in Manhattan Beach. It first summarizes feedback collected from the online survey and public workshops. The section also provides estimates and forecasts of bicycle commuting to determine the estimated bicycling demand in the city. It finally analyzes bicycle collision data between 2007 and 2009 to identify areas that would benefit from bicycle facility improvements.

7.3.1 Public Outreach

As mentioned in Chapter 1, the public had the opportunity to provide input in the planning process through an online survey and the first round of public workshops. This section summarizes locations in Manhattan Beach that the community identified as desirable for bikeways and bicycle support facilities.

The location that the community mentioned the most frequently as in need of bikeways is Valley Drive / Ardmore Avenue. Other locations that the public identified as desirable for bicycle facilities include streets that lead to the beach, such as Marine Avenue, and provide access to schools, including Longfellow Avenue. The community also identified major arterials, such as Artesia Boulevard, Manhattan Beach Boulevard, and Rosecrans Boulevard. Other locations mentioned were residential streets, like Pacific Avenue and Redondo Avenue.

The public identified Polliwog Park as a desirable location for bicycle parking.



The public identified Manhattan Beach Boulevard as desirable for bicycle facilities.

7.3.2 Bicycle Commuter Estimates and Forecasts

United States Census "Commuting to Work" data provides an indication of current bicycle system usage. **Appendix A-15** shows the percent bicycle commuters in Manhattan Beach by census tract. Manhattan Beach has the highest percentages of bicycle commuters in the central northern portion of the city, which correlates with the percentage of households without vehicles.

In addition to bicycle commuters in Manhattan Beach, bicyclists from neighboring communities use the city's bicycle network to reach their destinations and are not reflected in this data. This Plan addresses the need for regional connectivity to accommodate bicyclists passing through Manhattan Beach's bicycle network in **Section 7.4**.

Table 7-3 presents commute to work data estimates reported by the 2000 US Census for Manhattan Beach. For comparative purposes, the table includes commute to work data for the United States, California, and County of Los Angeles. According to these estimates, 0.3 percent of residents in Manhattan Beach commute predominantly by bicycle. Manhattan Beach also has low rates of carpooling and transit riding, which suggests that the city's high average median income and high car ownership rates influence mode split. It is important to note that this figure likely underestimates the true amount of bicycling that occurs in Manhattan Beach for several reasons. First, data reflects respondents' dominant commute mode and therefore does not capture trips to school, for errands, or other bike trips that would supplant vehicular trips. Also, US Census data collection methods only enable a respondent to select one mode of travel, thus excluding bicycle trips if they constitute part of a longer multimodal trip. The percentage of commuters in Manhattan Beach that commute by transit is much lower than that of those that drive alone. Manhattan Beach also has a low percentage of commuters carpooling and walking.

In addition to bicycle commuters in Manhattan Beach, bicyclists from neighboring communities use the city's bicycle network to reach their destinations and are not reflected in this data. This Plan addresses the need for regional connectivity to accommodate bicyclists passing through Manhattan Beach's bicycle network in **Section 7.4**.

Table 7-3: Means of Transportation to Work

Mode	United States	California	Los Angeles County	Manhattan Beach
Bicycle	0.38%	0.83%	0.62%	0.32%
Drove Alone – car, truck, or van	75.70%	71.82%	70.36%	84.47%
Carpool – car, truck, or van	12.19%	14.55%	15.08%	6.89%
Transit	4.73%	5.07%	6.58%	0.38%
Walked	2.93%	2.85%	2.93%	1.26%
Other Means	0.70%	0.79%	0.76%	0.61%
Worked at Home	3.26%	3.83%	3.49%	5.99%

Source: US Census 2000

Table 7-4 presents an estimate of current bicycling within Manhattan Beach using US Census data along with several adjustments for likely bicycle commuter underestimations, as discussed above. **Table 7-5** presents the associated air quality benefits from bicycling.

Table 7-4: Existing Bicycling Demand

Variable	Figure	Source
Existing study area population	34,039	2000 US Census, P1
Existing employed population	19,030	2000 US Census, P30
Existing bike-to-work mode share	0.32%	2000 US Census, P30
Existing number of bike-to-work commuters	61	Employed persons multiplied by bike-to-work mode share
Existing work-at-home mode share	6.0%	2000 US Census, P30
Existing number of work-at-home bike commuters	114	Assumes 50% of population working at home makes at least one daily bicycle trip
Existing transit-to-work mode share	0.4%	2000 US Census, P30
Existing transit bicycle commuters	18	Employed persons multiplied by transit mode share. Assumes 25% of transit riders access transit by bicycle
Existing school children, ages 6-14 (grades K-8)	4,047	2000 US Census, P8
Existing school children bicycling mode share	2.0%	National Safe Routes to School surveys, 2003.
Existing school children bike commuters	81	School children population multiplied by school children bike mode share
Existing number of college students in study area	1,713	2000 US Census, PCT24
Existing estimated college bicycling mode share	5.0%	Review of bicycle commute share in seven university communities (source: National Bicycling & Walking Study, FHWA, Case Study No. 1, 1995).
Existing college bike commuters	86	College student population multiplied by college student bicycling mode share
Existing total number of bike commuters	360	Total bike-to-work, school, college and utilitarian bike trips. Does not include recreation.
Total daily bicycling trips	719	Total bicycle commuters x 2 (for round trips)

Table 7-5: Existing Bicycling Air Quality Impact

Variable	Figure	Source
Current Estimated VMT Reductions		
Reduced Vehicle Trips per Weekday	233	Assumes 73% of bicycle trips replace vehicle trips for adults/college students and 53% for school children
Reduced Vehicle Trips per Year	60,836	Reduced weekday vehicle trips x 261 (weekdays / year)
Reduced Vehicle Miles per Weekday	1,564	Assumes average round trip travel length of 5 miles for adults/college students and 1 mile for schoolchildren
Reduced Vehicle Miles per Year	408,315	Reduced weekday vehicle miles x 261 (weekdays / year)
Current Air Quality Benefits		
Reduced Hydrocarbons (lbs/wkday)	5	Daily mileage reduction x 1.36 grams / mi
Reduced PM10 (lbs/wkday)	0	Daily mileage reduction x 0.0052 grams / mi
Reduced PM2.5 (lbs/wkday)	0	Daily mileage reduction x 0.0049 grams / mi
Reduced NOX (lbs/wkday)	3	Daily mileage reduction x 0.95 grams / mi
Reduced CO (lbs/wkday)	43	Daily mileage reduction x 12.4 grams / mi
Reduced C02 (lbs/wkday)	1,273	Daily mileage reduction x 369 grams / mi
Reduced Hydrocarbons (lbs/yr)	1,224	Yearly mileage reduction x 1.36 grams / mi
Reduced PM10 (lbs/yr)	5	Yearly mileage reduction x 0.0052 grams / mi
Reduced PM2.5 (lbs/yr)	4	Yearly mileage reduction x 0.0049 grams / mi
Reduced NOX (lbs/yr)	855	Yearly mileage reduction x 0.95 grams / mi
Reduced CO (lbs/yr)	11,162	Yearly mileage reduction x 12.4 grams / mi
Reduced $C0_2$ (lbs/yr)	332,167	Yearly mileage reduction x 369 grams / mi

Source:

Emissions rates from **EPA report 420-F-05-022** *Emission Facts: Average Annual Emissions and Fuel Consumption for Gasoline-Fueled Passenger Cars and Light Trucks.* 2005.

Table 7-6 presents projected year 2030 bicycling activity within Manhattan Beach using California Department of Finance population and school enrollment projections. The projection contains the assumption that bicycle mode share will double by 2030, due in part to bicycle network implementation. Actual bicycle mode share in 2030 will depend on many factors, including the extent of network implementation. **Table 7-7** presents the associated year 2030 air quality benefit forecasts. The calculations follow in a straightforward manner from the Projected Year 2030 Bicycling Demand.

Table 7-6: Projected Year 2030 Bicycling Demand

Variable	Figure	Source
Future study area population	42,359	Calculated based on CA Dept. of Finance, *Population Projections for California and Its Counties 2000-2050.*
Future employed population	23,681	Calculated based on CA Dept. of Finance, *Population Projections for California and Its Counties 2000-2050*,
Future bike-to-work mode share	0.64%	Double the rate from 2000 US Census, P30
Future number of bike-to-work commuters	152	Employed persons multiplied by bike-to-work mode share
Future work-at-home mode share	7.81%	Calculated based on change in mode share from 1990 US Census, P49, to 2000 US Census, P30
Future number of work-at-home bike commuters	185	Assumes 50% of population working at home makes at least one daily bicycle trip
Future transit-to-work mode share	0.8%	Double the rate from 2000 US Census, P30
Future transit bicycle commuters	45	Employed persons multiplied by transit mode share. Assumes 25% of transit riders access transit by bicycle
Future school children, ages 6-14 (grades K-8)	3,216	Calculated from CA Dept. of Finance, *California Public K–12 Graded Enrollment and High School Graduate Projections by County, 2010 Series.*
Future school children bicycling mode share	4.0%	Double the rate of national school commute trends. National Safe Routes to School surveys, 2003.
Future school children bike commuters	129	School children population multiplied by school children bicycling mode share
Future number of college students in study area	2,132	Calculated based on CA Dept. of Finance, Population Projections for California and Its Counties 2000-2050, Sacramento, California, July 2007.
Future estimated college bicycling mode share	7.0%	A slight increase over the existing college bicycle mode share assumption, commensurate with projected increases in bicycling for other populations
Future college bike commuters	149	College student population x college student bicycling mode share
Future total number of bike commuters	659	Total bike-to-work, school, college and utilitarian biking trips. Does not include recreation.
Total daily bicycling trips	1,319	Total bike commuters x 2 (for round trips)

Table 7-7: Projected Year 2030 Bicycling Air Quality Impact

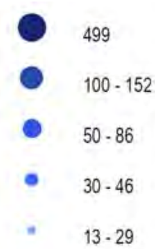
Variable	Figure	Source
Forecasted VMT Reductions		
Reduced Vehicle Trips per Weekday	423	Assumes 73% of biking trips replace vehicle trips for adults/college students and 53% for school children
Reduced Vehicle Trips per Year	110,354	Reduced number of weekday vehicle trips x 261 (weekdays / year)
Reduced Vehicle Miles per Weekday	2,905	Assumes average round trip travel length of 8 miles for adults / college students and 1 mile for schoolchildren
Reduced Vehicle Miles per Year	758,275	Reduced number of weekday vehicle miles x 261 (weekdays / year)
Forecasted Air Quality Benefits		
Reduced Hydrocarbons (lbs/wkday)	9	Daily mileage reduction x by 1.36 grams / mi
Reduced PM10 (lbs/wkday)	0	Daily mileage reduction x by 0.0052 grams / mi
Reduced PM2.5 (lbs/wkday)	0	Daily mileage reduction x by 0.0049 grams / mi
Reduced NOX (lbs/wkday)	6	Daily mileage reduction x by 0.95 grams / mi
Reduced CO (lbs/wkday)	79	Daily mileage reduction x by 12.4 grams / mi
Reduced $C0_2$ (lbs/wkday)	2,363	Daily mileage reduction x by 369 grams / mi
Reduced Hydrocarbons (lbs/yr)	2,274	Yearly mileage reduction x by 1.36 grams / mi
Reduced PM10 (lbs/yr)	9	Yearly mileage reduction x by 0.0052 grams / mi
Reduced PM2.5 (lbs/yr)	8	Yearly mileage reduction x by 0.0049 grams / mi
Reduced NOX (lbs/yr)	1,588	Yearly mileage reduction x by 0.95 grams / mi
Reduced CO (lbs/yr)	20,729	Yearly mileage reduction x by 12.4 grams / mi
Reduced CO_2 (lbs/yr)	616,861	Yearly mileage reduction x by 369 grams / mi

Source: Emissions rates from **EPA report 420-F-05-022** *Emission Facts: Average Annual Emissions and Fuel Consumption for Gasoline-Fueled Passenger Cars and Light Trucks.* 2005.

This model uses the latest state projections for population growth and reasonable assumptions about future bicycle ridership. The benefits model predicts that the total number of bicycle commute trips could increase from the current daily estimate of 700 to 1,300, resulting in a substantial reduction of both Vehicle Miles Traveled (VMT) and associated emissions. This includes a yearly emissions reduction by 2030 of approximately 1,600 pounds of smog forming N0X and roughly 600 thousand pounds of $C0_2$, the principal gas associated with global climate change. Providing bicycle facilities will encourage new bicyclists to begin to ride, thus positively impacting air quality by reducing harmful pollutants from driving motorized vehicles. Because this plan recommends local connections throughout and regional links between the participating cities, it has the potential to have even greater air quality benefits. Bicyclists may not need to rely as heavily on vehicles for transportation because bicycling will be a viable transportation alternative upon implementation of this Plan.

Weekday Bicycle Count Results in Manhattan Beach

(See Appendix A-16 for a larger map and Appendix H for a list of count locations.)



7.3.3 Bicycle Counts

To assess bicycling levels at different sites throughout Manhattan Beach, volunteers conducted bicycle counts, in which they manually recorded the number of bicyclists that rode by.

7.3.3.1 Methodology

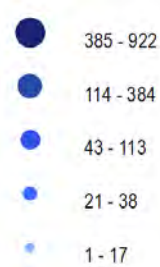
The methodology for the bicycle counts derives from the National Bicycle and Pedestrian Documentation Project (NBPD), a collaborative effort of Alta Planning + Design and the Institute of Transportation Engineers. The NBPD methodology aims to capture both utilitarian bicycling and recreational bicycling. The NBPD also provides guidance on how to select count locations.

Volunteers conducted bicycle counts in each of the seven participating cities in the South Bay on Thursday, November 4, 2010 from 3:00 p.m. to 6:00 p.m. and Saturday, November 6, 2010 from 10:30 a.m. to 1:30 p.m. These dates are meant to capture volumes of bicyclists on a typical weekday and weekend day. Fall is an appropriate time to conduct bicycle counts in California because school is back in session and vacations are typically over. In Manhattan Beach, volunteers were stationed at six locations on Thursday and seven locations on Saturday. There were 36 total locations in the South Bay region on each day.

The count locations were selected in partnership by city staff, Alta Planning + Design, Los Angeles County Bicycle Coalition staff, and

Weekend Bicycle Count Results in Manhattan Beach

(See Appendix A-17 for a larger map and Appendix H for a list of count locations.)



South Bay Bicycle Coalition board members. This snapshot of locations is meant to capture a diverse bicycling population using the roads and streets that span the spectrum of bike-friendliness.

7.3.3.2 Results

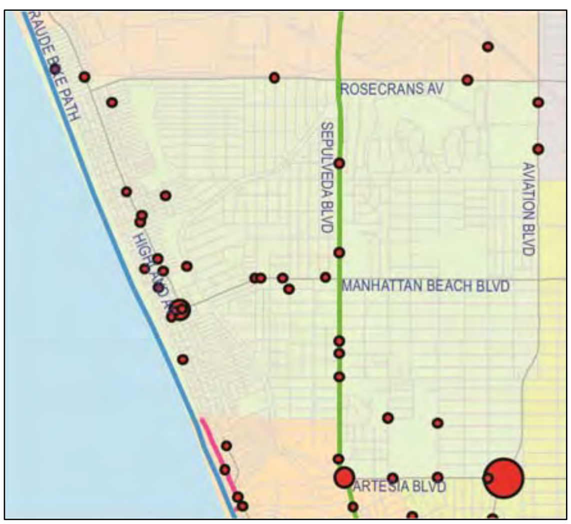
The count results for the South Bay are displayed in **Appendix A-16** and **Appendix A-17**. Count results for Manhattan Beach are shown on the previous page. Detailed count data, including a list of count locations, is presented in **Appendix H**. On Thursday, the Manhattan Beach station that experienced the highest volume was Manhattan Beach Boulevard and Manhattan Avenue with 75 bicyclists during the three hour count period. The station with the most bicyclists on Saturday was Manhattan Beach Boulevard and the Strand with 589 bicyclists during the three hour count period.

On both days, the locations with the highest numbers of bicyclists in the South Bay region as a whole were those along the Strand on the County-maintained Marvin Braude Bikeway. Apart from the Strand stations, the inland count locations in Lawndale and Gardena experienced the most riders during the week. On the weekend, there were overall fewer riders in the inland count stations and more riders along the coast. This suggests that more bicyclists ride a bicycle for commuting during the week and for recreation on the weekend.

In the region as a whole, approximately 83 percent of bicyclists were male. About 70 percent of those observed did not wear helmets and 41 percent rode on the sidewalks. On Thursday, there were 18 locations at which over half of the observed bicyclists rode on the sidewalk and on Saturday there were nine. Riding on the sidewalk can be an indicator of a lack of bicycle facilities, as bicyclists that are uncomfortable riding with traffic may choose to ride on the sidewalk instead.

7.3.4 Bicycle Collision Analysis

Safety is a major concern for both existing and potential bicyclists. Concern about safety is the most common reason given for not riding a bicycle (or riding more often), according to national surveys. Identifying bicycle collision sites can draw attention to areas that warrant improvement, particularly if multiple collisions occur at the same location. This analysis employs the most reliable data source available, the California Highway Patrol's Statewide Integrated Traffic Records System. The data set only includes reported collisions, and so represents a subset of all the bicycle



Bicycle Collisions in Manhattan Beach 2007-2009

(See Appendix A-18 for larger map)

collisions in Manhattan Beach. This data does not include any assessment of conditions present at the time of the collision. There are numerous factors that may contribute to a given incident including but not limited to time of day, visibility, distractions, obstacles or traffic law obedience. This data simply reflects reported incidents, resulting injuries and the party at fault. This data does not infer faulty infrastructure, but rather provides a baseline of collisions that often decreases in correlation with bike plan implementation and the improvements to facilities and road user behavior and awareness that accompanies it. Fault as determined by law enforcement is discussed below.

Table 7-8 presents the number of reported collisions involving bicyclists, number of bicyclists involved, and severity of the bicycle collisions for three consecutive years: 2007, 2008, and 2009. **Appendix A-18** shows locations of bicycle collisions in the South Bay region in the same time period. Bicycle collisions in Manhattan Beach are shown at right. There were 38 total reported collisions involving bicyclists from 2007-2009 in the City of Manhattan Beach. The intersection of Artesia Boulevard and Aviation Boulevard, which is on the border of the cities of Manhattan Beach and Redondo Beach, had four collisions involving bicyclists in the three year period. Other collisions in Manhattan Beach were concentrated on major boulevards: there were nine crashes on Manhattan Beach Boulevard, eight on Highland Avenue, and eight on Sepulveda Boulevard.

Table 7-8: Bicycle Collision Data 2007-2009

Total Crashes Involving Bicyclists	Number of Bicyclists Involved	Persons Injured	Persons Severely Injured	Persons Killed
38	38	36	5	1

Source: California Highway Patrol, Statewide Integrated Traffic Records System (SWITRS)

As reported by police officers in traffic reports, bicyclists were at fault in 63 percent of collisions involving bicycles (24 crashes) in this time period.

Providing bicycle facilities encourages more people to ride. When motorists begin to look for and expect to see bicyclists, collisions between vehicles and bicyclists are reduced. The City of New York, for example, reported that as ridership increased between 1998 and 2008, the number of annual casualties from bicycle collisions decreased (see **Appendix B**).

Appendix A-1 displays estimated weekday traffic volumes in Manhattan Beach. The streets with the highest traffic volumes are Sepulveda Boulevard, Aviation Boulevard, Rosecrans Avenue, and Manhattan Beach Boulevard. The only one of these streets with bicycle facilities is Sepulveda Boulevard, which has a Class III bike route. On Sepulveda, bicyclists must still share the traffic lanes with vehicular traffic, creating the potential for conflicts between the two modes. Installing bicycle facilities, especially on major arterials, could reduce the number and severity of collisions involving bicyclists.

7.4 Proposed Bicycle Network

This section presents the proposed bicycle network for the City of Manhattan Beach, which includes bicycle parking facilities. Upon implementation of the proposed network, the City should coordinate and collaborate with adjacent participating South Bay cities to emphasize a regional bicycle network. Bicycle facilities discussed in this Plan are described in **Section 1.3** and are shown in **Figure 1-3** and **Figure 1-4**. **Appendix C** outlines the recommended standards for each facility classification as compared to minimum standards. In addition to creating a comprehensive network of bikeways in Manhattan Beach, the recommended system ties into the proposed bicycle facilities for the other South Bay participating cities to create a connected regional network. This will give bicyclists from adjacent communities the opportunity to pass through Manhattan Beach to reach their destinations without losing bicycle facilities at city boundaries. Bikeway recommendations are also based on the existing City bicycle plans, public input, topography, traffic volumes, and traffic speeds.

The proposed bicycle network for the City of Manhattan Beach consists of Class I Bike Paths, Multi Use Paths, Class II Bike Lanes, Class III Bike Routes, and Bike Friendly Streets.

7.4.1 Proposed Bikeway Facilities

The proposed bicycle network for the City of Manhattan Beach consists of Class I Bike Paths, Multi Use Paths, Class II Bike Lanes, Class III Bike Routes, and Bike Friendly Streets, and is shown in **Figure 7-2.** Four tables identify the streets on which facilities are proposed, the extents of each proposed facility, and the length in miles of each proposed facility. **Table 7-9** lists the proposed bicycle paths, **Table 7-10** lists the proposed bicycle lanes, **Table 7-11** lists the proposed bicycle routes, and **Table 7-12** lists the proposed bicycle-friendly streets. The proposed Bicycle network for the South Bay region as a whole is presented in **Appendix A-19**. The proposed bicycle network in Manhattan Beach connects with the recommended networks in El Segundo, Hermosa Beach, and

Redondo Beach. **Figure 7-2** shows a blue asterisk at the steps between Manhattan Beach and Hermosa Beach, which is outside the jurisdiction of this plan, but is a supported improvement.

Table 7-9: Proposed Class I Bicycle Paths in Manhattan Beach

Street	From	To	Miles
Bell Ave Extension	33rd St	beginning of Bell Ave south of 30th St	0.1
Marine Ave Park	Redondo Ave Extension	Redondo Ave	0.1
Total Bicycle Path Mileage			**0.2**

Table 7-10: Proposed Class II Bicycle Lanes in Manhattan Beach

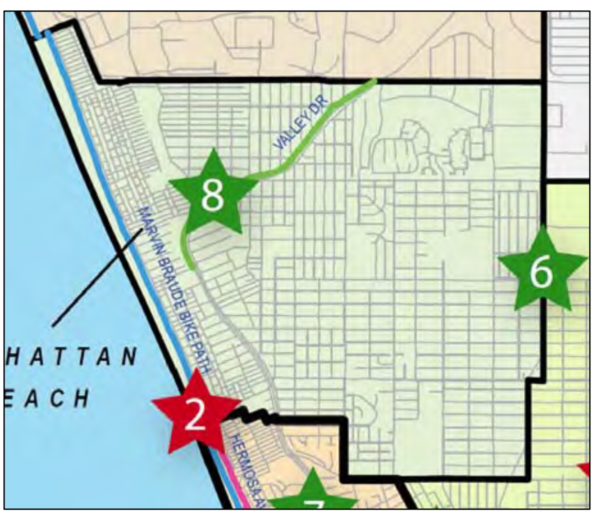
Street	From	To	Miles
Manhattan Beach Blvd	Ardmore Avenue	Aviation Blvd	1.7
Rosecrans Ave	Highland Ave	Aviation Blvd	2.3
Marine Ave	Sepulveda Blvd	Aviation Blvd	1.0
Aviation Blvd	Rosecrans Ave	South City Limits	2.1
Total Bicycle Lane Mileage			**7.0**

Table 7-11: Proposed Class III Bicycle Routes in Manhattan Beach

Street	From	To	Miles
Valley Dr	15th St	South City Limits	0.9
45th St	The Strand	Crest Dr	0.2
15th St	Ocean Dr	Valley Dr	0.2
Highland Av	45th St	33rd St	2.2
Ardmore Ave	Rosecrans Ave	South City Limits	2.1
Redondo Ave - Redondo Ave Extension	Rosecrans Ave	Marine Ave	0.6
Manhattan Ave	15th St	1st St	0.7
Manhattan Beach Blvd	Ocean Dr	Valley Dr	0.2
Rosecrans Ave	The Strand	Highland Ave	0.1
38th Pl	Highland Ave	Crest Dr	0.0
Total Bicycle Route Mileage			**7.1**

Table 7-12: Proposed Bicycle-Friendly Streets in Manhattan Beach

Street	From	To	Miles
Marine Ave	The Strand	Blanch Rd	0.4
Marine Ave	Ardmore Avenue	Sepulveda Blvd	0.4
1st St	Manhattan Avenue	John St	0.4
Bell Ave	Rosecrans Ave	North of 29th St	0.2
Bell Ave - Blanch Rd	North of 29th St	Valley Dr	0.6
Pacific Ave - 5th St	Rosecrans Ave	Ardmore Ave	1.4
Ocean Dr	45th St	1st St	2.1
Oak Ave	Ardmore Ave	Manhattan Beach Blvd	0.8
8th St	Ardmore Ave	Aviation Blvd	1.5
Redondo Ave	Marine Ave	Artesia Blvd	1.5
2nd St	John St	East City Limits	1.3
Meadows Ave - Tennyson St - Prospect Ave	Marine Ave	Artesia Blvd	1.6
11th St	Ardmore Ave	Aviation Blvd	1.6
Peck Ave	Manhattan Beach Blvd	Artesia Blvd	1.0
Voorhees Ave	Peck Ave	Aviation Blvd	0.4
Mathews Ave	Peck Ave	Aviation Way	0.4
Harkness St	Marine Ave	2nd St	1.0
Total Bicycle-Friendly Street Mileage			**16.7**



Opportunities and Constraints in Manhattan Beach

(See Appendix I for larger map)

There are several opportunities and constraints to recommending new bicycle facilities in Manhattan Beach. These are shown at right and are referenced by the numbers in **Appendix I**. **Appendix I** also presents opportunities and constraints in the South Bay region as a whole.

One opportunity includes a proposed Class II on Aviation Boulevard in Redondo Beach and Manhattan Beach. This major thoroughfare provides significant connectivity between residences and major employment centers and thus a bicycle facility on Aviation Boulevard will encourage increased bike commuting to these destinations. See Vitality City's Livability Plan for further detail. Another opportunity is a proposed Class III bikeway on Valley Drive/Ardmore Avenue in Manhattan Beach: While this plan recommends a Class III route, the Vitality City Livability Plan recommends additional options. See the Vitality City Livability Plan for further detail and opportunities.

A constraint is the stairs on the Strand between Hermosa Beach and Manhattan Beach. This constraint is also noted as being outside this plan's jurisdiction because those stairs (along with the

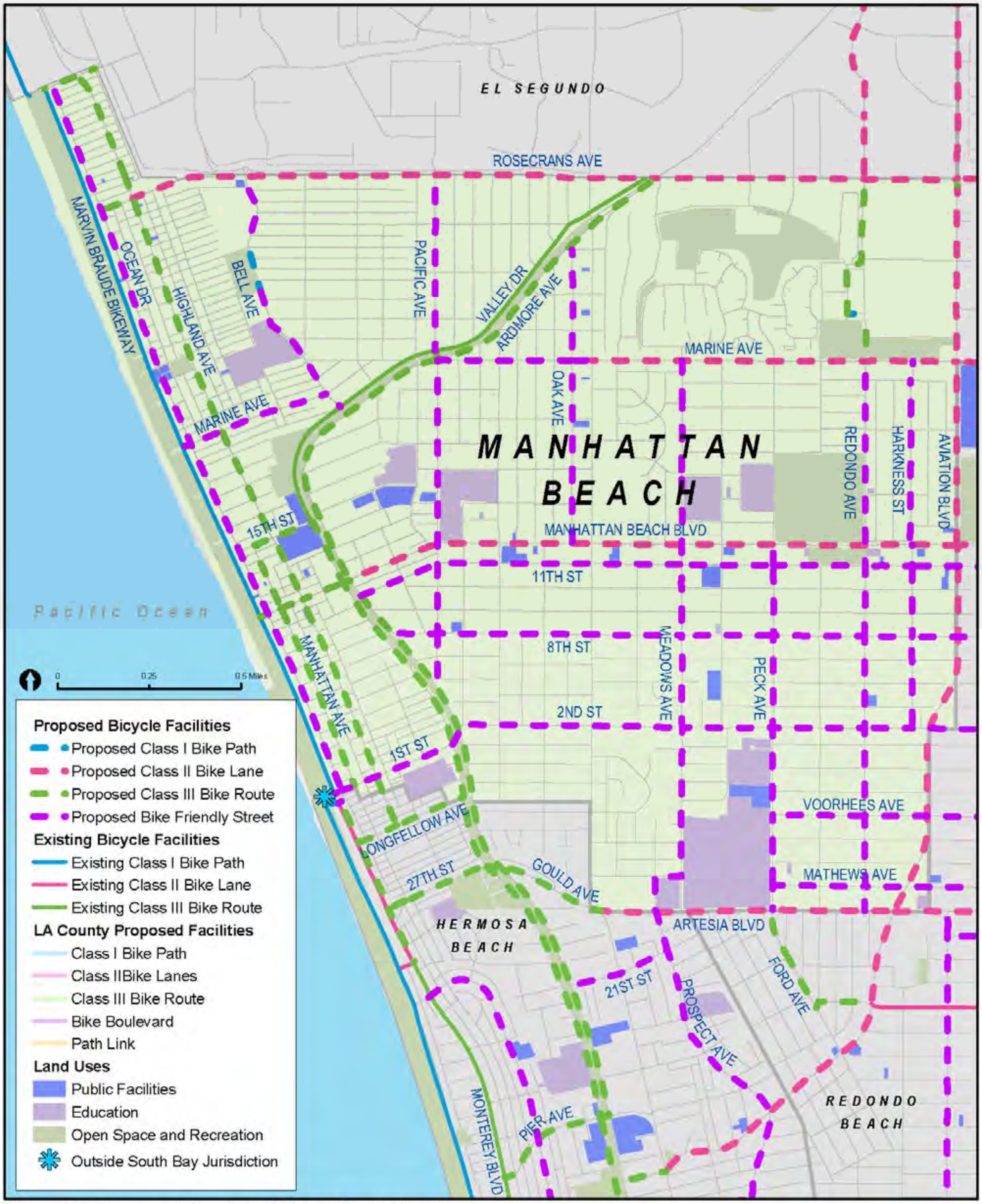


Figure 7-3: Proposed Bicycle Facilities in Manhattan Beach

South Bay Bicycle Master Plan
El Segundo · Gardena · Hermosa Beach · Lawndale · Manhattan Beach · Redondo Beach · Torrance

rest of the Strand with the exception of Hermosa Beach) are operated by the State and maintained by the County of Los Angeles. However, this plan urges the cities to remedy the disruption caused by the stairs. This remedy could come in several forms ranging from a bike-friendly ramp that connects the two sections of the Strand to signage that warns cyclists of the disruption and safely guides them to facilities along Hermosa Avenue.

7.4.2 Proposed End-of-Trip Bicycle Facilities

The flat top bicycle rack shown above is an example of a recommended rack type. See Appendix JJ for additional recommended bicycle rack types.

Support facilities and connections to other modes of transportation are essential components of a bicycle system because they enhance safety and convenience for bicyclists at the end of every trip. With nearly all utilitarian and many recreational bike trips, bicyclists need secure and well-located bicycle parking. A comprehensive bicycle parking strategy is one of the most important things that a jurisdiction can apply to immediately enhance the bicycling environment. Moreover, a bicycle parking strategy with connections to public transit will further the geographical range of residents traveling without using an automobile.

The Manhattan Beach Municipal Code currently provides bicycle parking requirements based on percent of vehicle parking at specific land uses, as well as bicycle parking design requirements. The City should consider amending its Municipal Code to include bicycle parking requirements at new and retrofitted multi-family residential, office, and mixed-use developments of all sizes. The Municipal Code should also consider requiring bicycle parking quantities based on square footage of developments or by number of employees/residents to adequately address the bicycle demand at each development.

Manhattan Beach should also consider amending its Municipal Code to include more specific requirements on types of both short- and long-term bicycle parking facility designs, which are shown in **Appendix J**. Bicycle rack designs should be considered that provide two points of contact with the bicycle so that it can be locked from both the front wheel/frame and the rear wheel. This will provide a high degree of security and support for the bicycle. Long-term bicycle parking should be in the form of:

- Covered, lockable enclosures with permanently anchored racks for bicycles
- Lockable bicycle rooms with permanently anchored racks or
- Lockable, permanently anchored bicycle lockers

When people commute by bicycle they often sweat or become dirty from weather or road conditions. Providing changing and storing facilities encourages commuters to travel by bicycle because they have a place to clean up before work or school. Manhattan Beach's Municipal Code should require all new mid-to-large employers, offices, and businesses to supply changing and storing facilities, such as by providing showers and clothes lockers within the buildings or arranging agreements with nearby recreation centers to allow commuters to use their facilities.

Proposed end-of-trip bicycle facilities in Manhattan Beach are shown in **Figure 7-3.** The City should continue to provide short-term bicycle parking in the form of bicycle racks at all major trip attractors, including commercial and civic activity centers and transit hubs, and ensure that an adequate supply is available. The City should prioritize the installation of bicycle parking throughout the city, with particular attention directed at the following locations:

High-activity locations such as transit stations, offices, and major commercial districts could consider providing more secure, long-term bicycle parking options.

- Parks
- Schools
- Commercial/office areas
- Civic/government buildings
- Public transit stations
- Downtown Manhattan Beach
- The Beach at the Pacific Ocean

High-activity locations such as transit stations, offices, and major commercial districts could consider providing more secure, long-term bicycle parking options, such as bicycle lockers. Any future transit hubs and intermodal facilities could include secure bicycle parking areas as part of their design. Secure bicycle parking areas that provide services, such as bicycle rentals and repair, could be considered at major transit stations and commuter destinations.

Figure 7-4: Manhattan Beach Proposed End-of-Trip Facilities

South Bay Bicycle Master Plan

El Segundo - Gardena - Hermosa Beach - Lawndale - Manhattan Beach - Redondo Beach - Torrance

7.5 Project Costs

This section presents the cost to implement the proposed bicycle network in Manhattan Beach.

7.5.1 Cost Estimates

displays the planning-level capital cost assumptions for each facility type proposed in this plan, and **Table 7-14** displays the cost to implement the proposed network in the City of Manhattan Beach from the cost assumptions.[22] Cost assumptions are based on LA County averages and may vary depending on environmental conditions of a given facility, unforeseen construction cost variations, and similar considerations. Cost assumptions exclude specific treatments that may vary by location and must be determined by field review, such as traffic calming measures, restriping of existing travel lanes, and sign removal. Cost assumptions do not include traffic signal improvements, such as changes to phasing, recalibration of loop detectors, or installation of push buttons. For detailed cost estimations, refer to the project sheets presented in **Section 7.7**.

Table 7-13: Unit Cost Estimates for Proposed Bicycle Facility Types

Facility Type	Description	Estimated Cost[23]
Class I Bicycle Path	Paving, striping and signage	$800,000 / mile
Class II Bicycle Lanes (two sides)	Striping, signage, and travel lane restriping	$40,000 / mile
Class III Bicycle Routes (two sides)	Signage	$15,000 / mile
Class III Bicycle Routes (two sides) with sharrows	Pavement markings and signage	$25,000 / mile
Bicycle Friendly Street	Pavement markings, signage, and limited traffic calming	$30,000 / mile

[22] **Table 7-14** assumes the cost of implementing Class III Bicycle Routes with Sharrows based on the policies presented in **Chapter 2**

[23] Cost estimates include physical removals and installations (e.g. of signs and striping), contract contingency costs, preliminary engineering, and construction engineering. The source for the unit costs is the LA County Bicycle Master Plan, which are based upon a peer review of Southern California bikeway construction unit costs.

Table 7-14: Estimated Cost of Proposed Bicycle Network

Facility Type	Unit Cost per mile	Length of Proposed Network (miles)	Cost
Bicycle Path	$800,000	0.2	$ 192,000
Bicycle Lane	$40,000	7.0	$ 280,000
Bicycle Route with sharrows	$25,000	7.1	$ 179,000
Bicycle-Friendly Street	$30,000	16.7	$ 502,000
Total		**31.0**	**$ 1,153,000**

7.6 Project Prioritization

A prioritized list of bicycle projects will help guide the City of Manhattan Beach in implementing the proposed bicycle facilities presented in this Plan. Each proposed facility discussed in **Section 7.4.1** is grouped into projects based on feasibility of implementation. **Table 7-15** presents the prioritized projects based on the prioritization methodology displayed in **Appendix K**. Each criterion contains information about a facility and its ability to address an existing or future need in Manhattan Beach. The projects ranked the highest should be implemented first.

Table 7-15: Manhattan Beach Prioritized Bicycle Projects

Facility Type*	Facility Name	From	To	Gap Closure	Connectivity: Existing	Connectivity: Regional	Connectivity: Activity Centers	Connectivity: Multi-Modal	Safety	Public Input	Underserved Communities	Project Cost	Parking Displacement	Total
BR	Valley Dr	15th St	South City Limits	3	6	0	4	0	1	2	1	2	2	**21**
BFS	Marine Ave	The Strand	Blanch Rd	3	6	0	4	0	1	2	0	2	2	**20**
BFS	Marine Ave	Ardmore Avenue	Sepulveda Blvd	3	6	0	4	0	0	2	0	2	2	**19**
BL	Manhattan Beach Blvd	Ardmore Avenue	Aviation Blvd	3	6	0	4	0	2	2	1	0	1	**19**
BL	Rosecrans Ave	Highland Ave	Aviation Blvd	3	6	0	4	0	1	2	1	0	1	**18**
BFS	1st St	Manhattan Avenue	John St	3	6	0	4	0	0	0	1	2	2	**18**
BR	45th St	The Strand	Crest Dr	3	6	0	4	0	0	0	0	2	2	**17**
BR	15th St	Ocean Dr	Valley Dr	3	6	0	4	0	0	0	0	2	2	**17**
BFS	Pacific Ave - 5th St	Rosecrans Ave	Ardmore Ave	0	6	0	4	0	1	1	1	1	2	**16**
BR	Highland Av	45th St	33rd St	0	3	0	2	0	2	2	1	1	2	**13**
BFS	Ocean Dr	45th St	1st St	0	3	0	2	0	1	1	1	1	2	**11**
BFS	Oak Ave	Ardmore Ave	Manhattan Beach Blvd	0	0	0	4	0	0	2	0	2	2	**10**

Facility Type*	Facility Name	From	To	Gap Closure	Connectivity: Existing	Connectivity: Regional	Connectivity: Activity Centers	Connectivity: Multi-Modal	Safety	Public Input	Underserved Communities	Project Cost	Parking Displacement	Total
BR	Ardmore Ave	Rosecrans Ave	South City Limits	0	0	0	4	0	0	2	1	1	2	**10**
BR	Manhattan Ave	15th St	1st St	0	3	0	0	0	2	2	1	2	0	**10**
BR	Manhattan Beach Blvd	Ocean Dr	Valley Dr	0	3	0	0	0	2	2	1	2	0	**10**
BFS	8th St	Ardmore Ave	Aviation Blvd	0	0	0	4	0	1	1	0	1	2	**9**
BFS	Ardmore Ave	John St	Redondo Ave	0	0	0	2	2	0	1	1	1	2	**9**
BFS	Meadows Ave - Tennyson St - Prospect Ave	Marine Ave	Artesia Blvd	0	3	0	0	0	1	1	1	1	2	**9**
BFS	Voorhees Ave	Peck Ave	Aviation Blvd	0	3	0	0	0	1	1	0	2	2	**9**
BR	Rosecrans Ave	The Strand	Highland Ave	0	3	0	0	0	2	2	0	2	0	**9**
BFS	2nd St	John St	East City Limits	0	0	0	4	0	1	0	0	1	2	**8**
BR - BP - BR	Redondo Ave	Rosecrans Ave	Marine Ave	0	0	0	4	4	0	0	0	0	0	**8**
BL	Marine Ave	Sepulveda Blvd	Aviation Blvd	3	0	0	0	0	0	2	1	1	1	**8**

Facility Type*	Facility Name	From	To	Gap Closure	Connectivity: Existing	Connectivity: Regional	Connectivity: Activity Centers	Connectivity: Multi-Modal	Safety	Public Input	Underserved Communities	Project Cost	Parking Displacement	Total
BFS	Mathews Ave	Peck Ave	Aviation Way	0	3	0	0	0	0	1	0	2	2	**8**
BFS	Harkness St	Marine Ave	2nd St	0	3	0	0	0	0	1	0	2	2	**8**
BFS	11th St	Ardmore Ave	Aviation Blvd	0	3	0	0	0	1	0	0	1	2	**7**
BFS	Peck Ave	Manhattan Beach Blvd	Artesia Blvd	0	3	0	0	0	1	0	0	1	2	**7**
BR	38th Pl	Highland Ave	Crest Dr	0	3	0	0	0	0	0	1	2	0	**6**
BFS - BP - BFS	Bell Ave - Blanch Rd	Rosecrans Ave	Valley Dr	3	0	0	2	0	0	0	0	0	0	**5**
BL	Aviation Blvd	Rosecrans Ave	South City Limits	0	0	0	0	0	2	2	1	0	0	**5**

*BP=Bike Path, BL=Bike Lane, BR=Bike Route, BFS=Bike Friendly Street

7.7 Project Sheets

The City of Manhattan Beach selected two of its top priority projects from the previous table for more detailed concept designs. Project sheets are shown on the following pages and include:

- A review of the existing site conditions
- Site challenges
- Recommended improvements
- Estimated cost
- Photos
- Aerial images
- Concept graphics

Manhattan Beach Project #1: Manhattan Beach Boulevard (Aviation Boulevard to the Strand)

Project Site

Manhattan Beach Boulevard is an east-west corridor located in the center of the City of Manhattan Beach. It connects to Redondo Beach to the east and to the Marvin Braude Bikeway (The Strand) and beach to the west. Manhattan Beach Boulevard provides access to Polliwog Park, Manhattan Heights Park, Manhattan Beach Middle School, Meadows Elementary School, Pacific Elementary School, American Martyrs School, residential/commercial uses, and Downtown Manhattan Beach. There is existing on-street parking along most of the street that is highly utilized in certain segments, including Downtown Manhattan Beach and Polliwog Park.

Between Aviation Boulevard and Sepulveda Boulevard, Manhattan Beach Boulevard two travel lanes in each direction and center medians. The roadway width is approximately 32 feet on each side of the median with on-street parallel parking, with exception to a short segment east of Sepulveda Boulevard where the width drops to 25 feet on the north side of the road and no on-street parking is present. From Sepulveda Boulevard to Dianthus Street, Manhattan Beach Boulevard has two travel lanes in each direction and is approximately 27 feet wide on each side of center medians with parallel on-street parking. From Dianthus Street to Pacific Avenue, Manhattan Beach Boulevard has two travel lanes in each direction and the roadway width is approximately 59 feet with parallel on-street parking. The posted speed limit between Aviation Boulevard and Pacific Avenue is 35 mph. Between Pacific Avenue and Valley Drive/Ardmore Avenue, the street has one westbound travel lane and two eastbound travel lanes. This segment of Manhattan Beach Boulevard is approximately 48 to 50 feet wide with parallel on-street parking. The posted speed limit is 30 mph. West of Valley Drive, the roadway widens to approximately 58 to 60 feet wide, has one travel lane in each direction, left turn pockets, and a mix of angled and parallel on-street parking. The posted speed limit is 25 mph.

Project Challenges

Manhattan Beach Boulevard has no existing bicycle facilities, thus bicyclists must share the road with relatively high volumes of vehicles, especially east of Pacific Avenue. Rolling hills can create potential conflicts between bicyclists and motorists due to the speed differential on inclines. On-street parking along Manhattan Beach Boulevard reduces the available space for bicycle facilities.

Proposed Improvements

- Stripe 1.8 miles of Class II Bike Lanes and signs
- Install 0.3 miles of Class III Bike Route signs
- Add bicycle detection and pavement markings at all signalized intersections
- Remove approximately 69 spaces of on-street parking between Sepulveda Boulevard and Pacific Avenue
- Remove one eastbound travel lane between Pacific Avenue and Ardmore Avenue
- Convert angled parking to head out angled parking west of Valley Drive
- Install intersection crossing treatment at Valley Dr/Ardmore Ave

Estimated Cost

$110,000

Photos

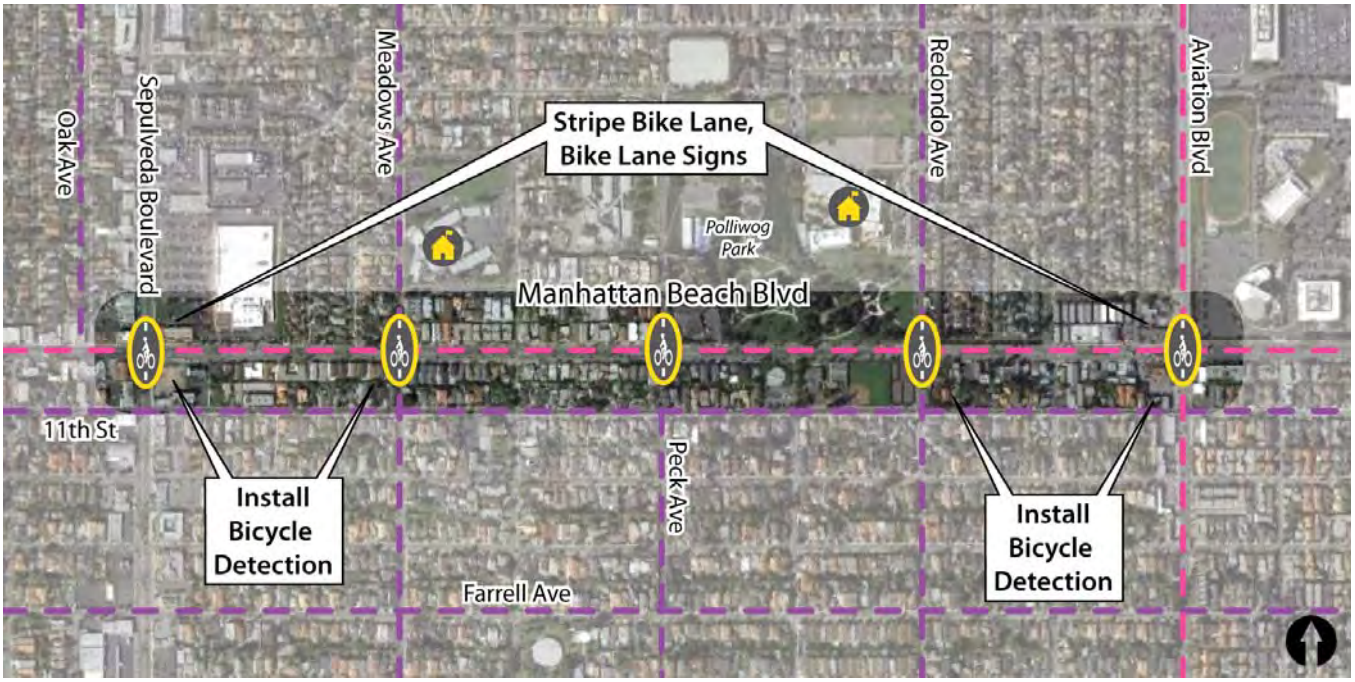
Looking west on Manhattan Beach Boulevard. Bike lanes will provide children riding to school a safer commute.

Removing the additional westbound travel lane west of Pacific Avenue will allow for bicycle lanes without parking removal.

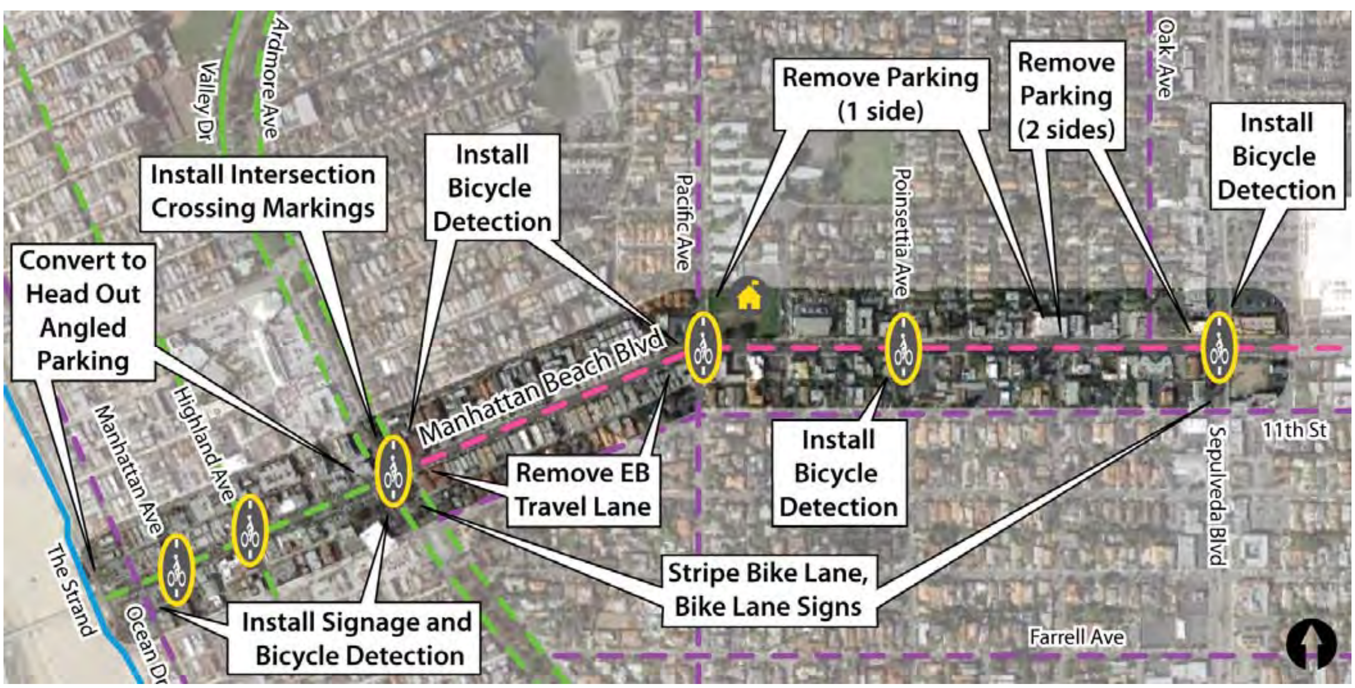
Removing on-street parking spaces to install bicycle lanes will provide a safe and convenient bicycling environment.

Aerial Map and Concept Graphics: Manhattan Beach Boulevard

Manhattan Beach Boulevard (Aviation Boulevard to Sepulveda Boulevard)



Manhattan Beach Boulevard (Sepulveda Boulevard to the Strand)



Aerial Map and Concept Graphics: Manhattan Beach Boulevard

Head Out Angled Parking and Intersection Crossing Markings

Source: NACTO.org

Bicycle Loop Detector

Manhattan Beach Project #2: Redondo Avenue (Artesia Boulevard to Marine Avenue)

Project Site

Redondo Avenue is a north-south residential street located in the eastern portion of the City of Manhattan Beach with rolling hills. Redondo Avenue provides access to Marine Avenue Park, Marine Sports Complex, Manhattan Heights Park, Manhattan Beach Middle School, and Polliwog Park. North of 11th Street there is existing on-street parallel parking along both sides of Redondo Avenue. South of 11th Street there is on-street parallel parking on the northbound side only. Though private property, a connection between Marine Avenue and Rosecrans Avenue could be pursued in the future to provide a continuous route on Redondo Avenue from Redondo Beach to El Segundo (Douglas Street).

Redondo Avenue has one travel lane in each direction and a striped center line. The posted speed limit is 25 mph. There are existing striped crosswalks at signalized intersections and around Manhattan Beach Middle School.

Project Challenges

Redondo Avenue has no existing bicycle facilities, which creates potential conflicts between bicyclists and motorists. Children commuting to school and others accessing the parks by bicycle must share the road with vehicles without any treatments alerting motorists of their presence. Rolling hills create a speed differential between bicyclists and vehicular traffic and can also create conflicts.

Proposed Improvements

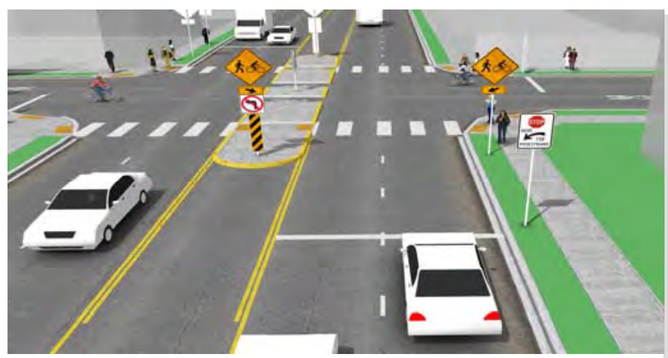
- Install signage and stripe pavement markings, such as sharrows or bike friendly street stencils
- Add bicycle detection and pavement markings at all signalized intersections
- Construct a median refuge island at the intersection of Redondo Avenue and Artesia Boulevard
- Construct bulbouts with high visibility crosswalks
- Install speed feedback signs located on the steep grade between Mathews Avenue and Artesia Boulevard

Estimated Cost

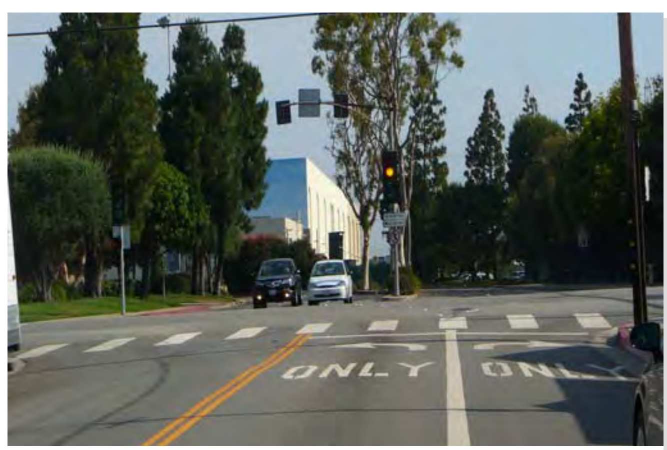
$1,750,000

Photos and Concepts

Looking south on Redondo Avenue. Pavement markings and signage will alert drivers of the presence of bicyclists



Median refuge islands provide bicyclists a protected space to wait for gaps in traffic. (Source: NACTO.org)

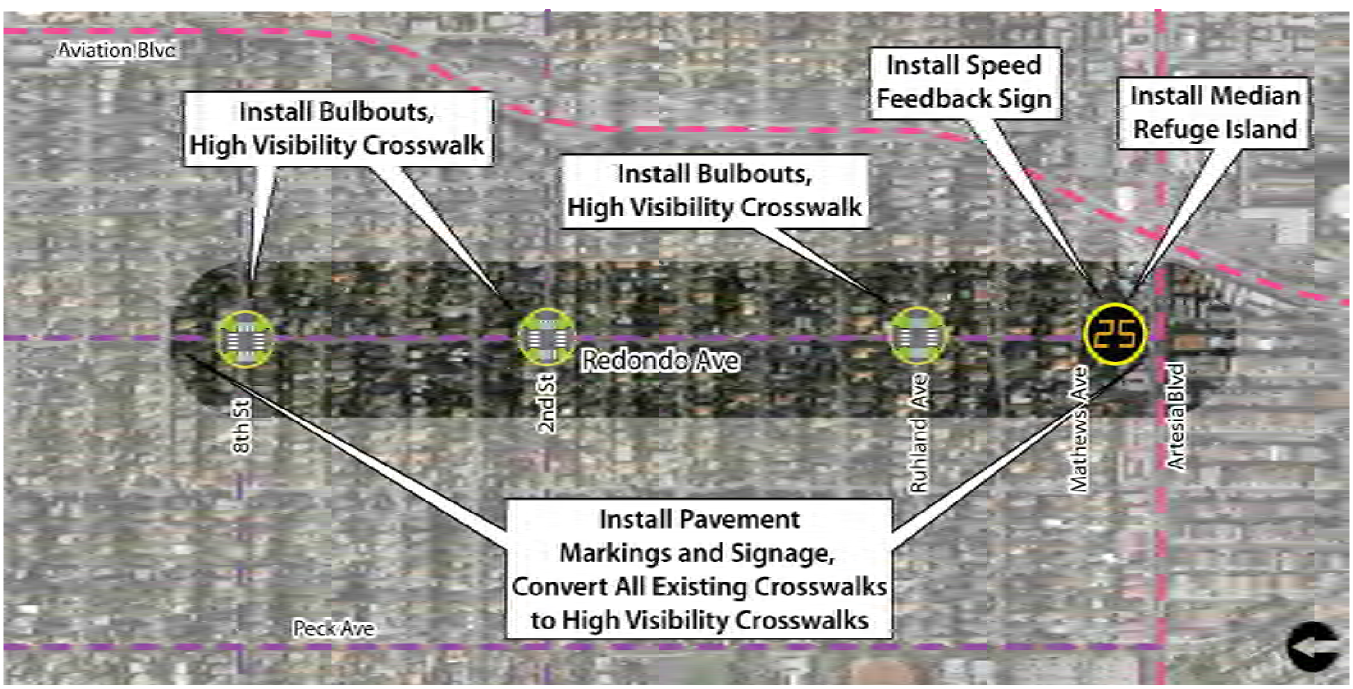


Bicycle detectors at intersections will allow bicycles to trigger the signal when no vehicles are present.

Aerial Map and Concept Graphics: Redondo Avenue

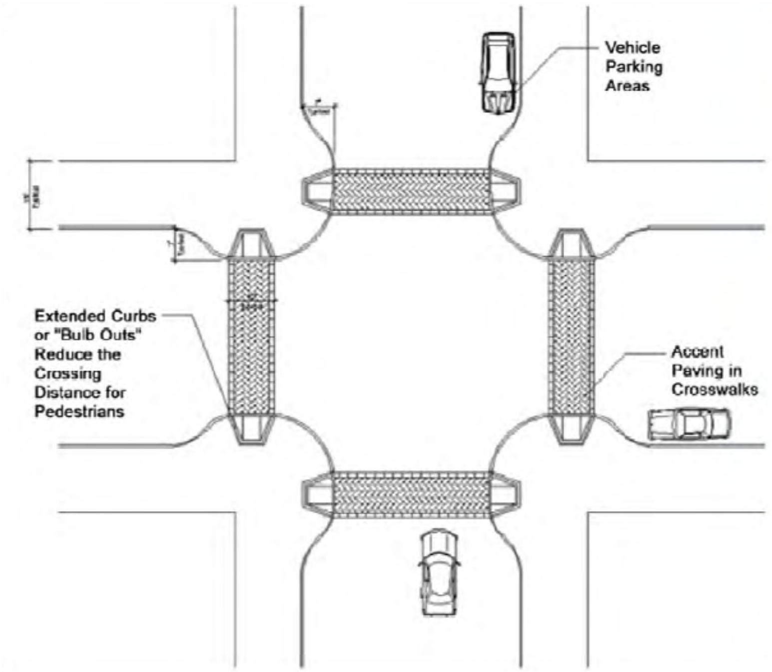
Redondo Avenue (Marine Ave to 8th Street)

8th Street to Artesia Blvd



Aerial Map and Concept Graphics: Redondo Avenue

Bulbouts and High Visibility Crosswalk



Speed Feedback Sign and Median Refuge Island