Chapter 4

Gardena

4 Gardena

This chapter presents Gardena's portion of the South Bay Bicycle Master Plan. It begins with a discussion of how Gardena 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
- Project costs

4.1 Bicycle Transportation Account (BTA) Compliance

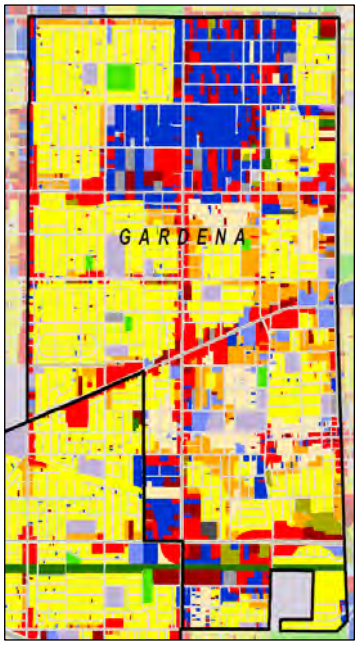
The Bicycle Transportation Account (BTA) is an annual statewide discretionary program that funds bicycle projects through the Caltrans Bicycle Facility Unit. Available as grants to local jurisdictions, the program emphasizes projects that benefit bicycling for commuting purposes. In order for Gardena 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 in tabular form. The tables include "Approved" and "Notes/Comments" columns for the convenience of the Metro official responsible for reviewing compliance.

4.2 Existing Conditions

The City of Gardena is located in the northeast portion of the South Bay. It is bordered by the City of Hawthorne and the County of Los Angeles to the north and west, the City of Torrance to the south, and the City of Los Angeles to the east. According to the 2000 census, Gardena has a population of 57,818. The city was incorporated in 1930.

4.2.1 Land Use

Appendix A-3 displays a map of the existing land uses in the South Bay Region. Land uses in Gardena are shown at right. Over half of the City's land area is comprised of residential land uses, most of which is single family. Industrial, commercial, and general office uses make up approximately 30 percent of the land area, which suggests that there are more people living in Gardena than there are jobs available.



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

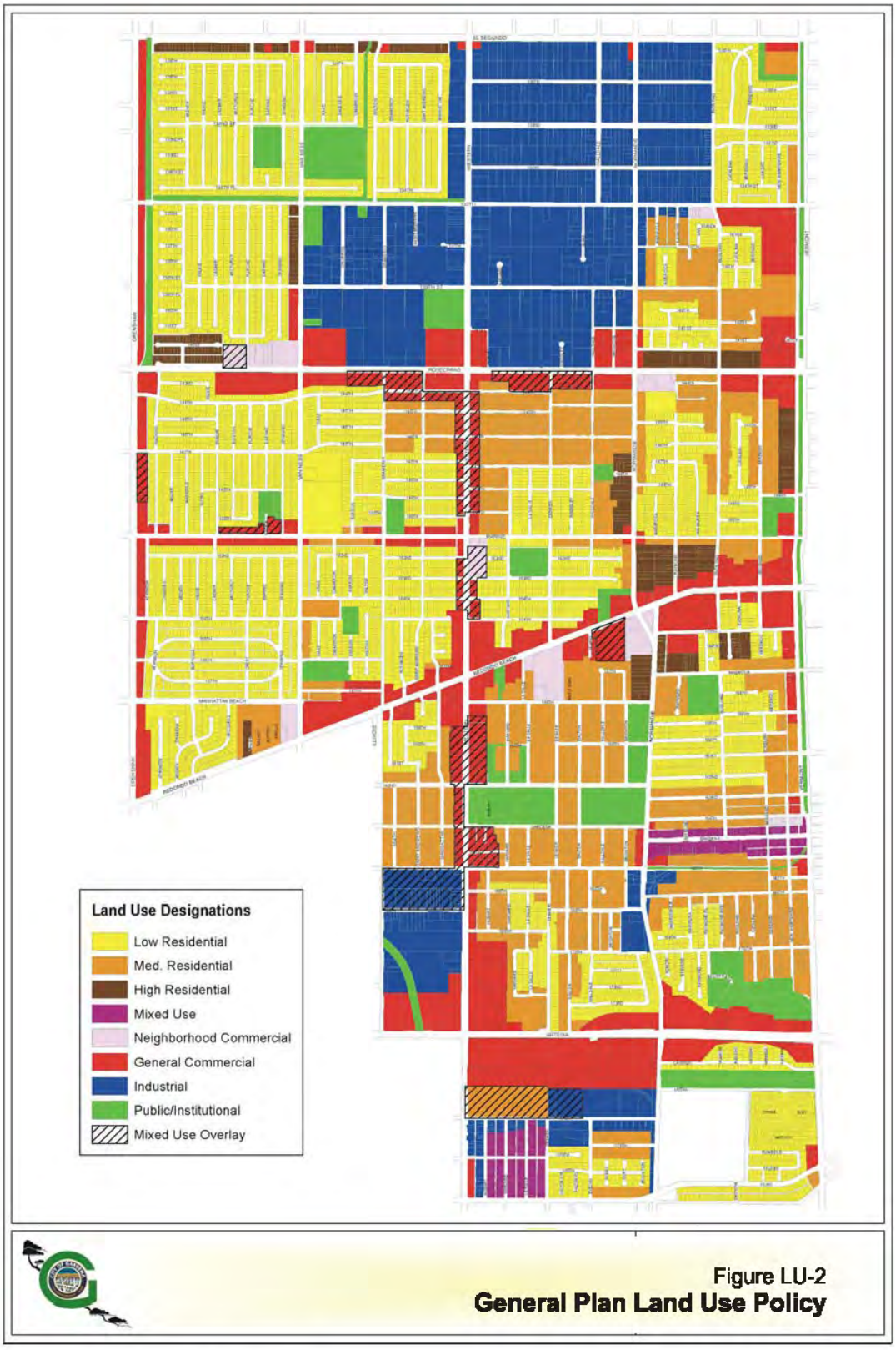


Figure 4-1: Gardena General Plan Land Uses

South Bay Bicycle Master Plan

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

Source: City of Gardena (2006)

Figure 4-1 illustrates proposed land uses. As compared to existing land uses, the City plans to increase the residential densities in the southern portion of Gardena east of Normandie Avenue. It also intends on creating mixed use developments along 161st Street and 182nd Street.

4.2.2 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 Gardena. 70 percent of the residential land area in the City is single family, low density housing. Low density units generally produce fewer trips as there are fewer persons per acre. They also present challenges to bicycling because there are not as many community services, such as restaurants or grocery stores nearby, so bicyclists must make longer trips to conduct their day-to-day activities. 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. The highest population densities in Gardena are in the central and eastern portions of the city.

Appendix A-5 displays employment density in Gardena. The City has high employment densities along major corridors, such as Redondo Beach Boulevard, Western Avenue, and 166th Street. The land uses along Redondo Beach Boulevard are mainly commercial and services, while the land use along Western Avenue is industrial. 166th Street has a mix of industrial, and commercial and services. 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-7, and **Appendix A-8** display the number and percent of zero-vehicle households, median annual income, and percent transit commuters by census tract. Throughout most of Gardena, households have median annual incomes below $35,000 (in 1999 dollars) and at least five percent of households do not own a vehicle. The City also has high percentages of transit commuters. This increases the potential for

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, Gardena 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 Gardena, 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.

4.2.3 Relevant Plans and Policies

Table 4-1 outlines information regarding bicycles from the City of Gardena's Circulation Element.

Table 4-1: Gardena Bicycle-Related Plans and Policies

Document	Description
General Plan Circulation Plan (2006)	The City of Gardena most recently updated its General Plan in 2006. The Circulation Plan, which is part of the Community Development Element, is included in this update. The Circulation Plan contains the Bikeways Map (**Appendix F-2**), which displays where the existing Class I and Class III bicycle facilities are located in the city. There are no proposed facilities shown on the map. The Circulation Plan also addresses bicycling in its goal to promote safe, efficient, and accessible alternative transportation modes. To do so, the City will maintain a citywide bicycle route and maintenance plan that is integrated with MTA's regional bicycle system.
Municipal Code	The City's Municipal Code requires all bicycles to be registered with the police department and the owner to obtain a bicycle license. Riding bicycles on the sidewalk is prohibited in business districts and prohibited outside of business districts unless roadway conditions are hazardous or unsafe.

4.2.4 Existing Bicycle Network

Figure 4-2 shows a map of the existing bicycle facilities in Gardena. **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 City of Gardena has approximately 16 total miles of bikeways, 80 percent of which make up an extensive network of Class III bike routes. **Table 4-2** summarizes the classification and mileage of the existing network.

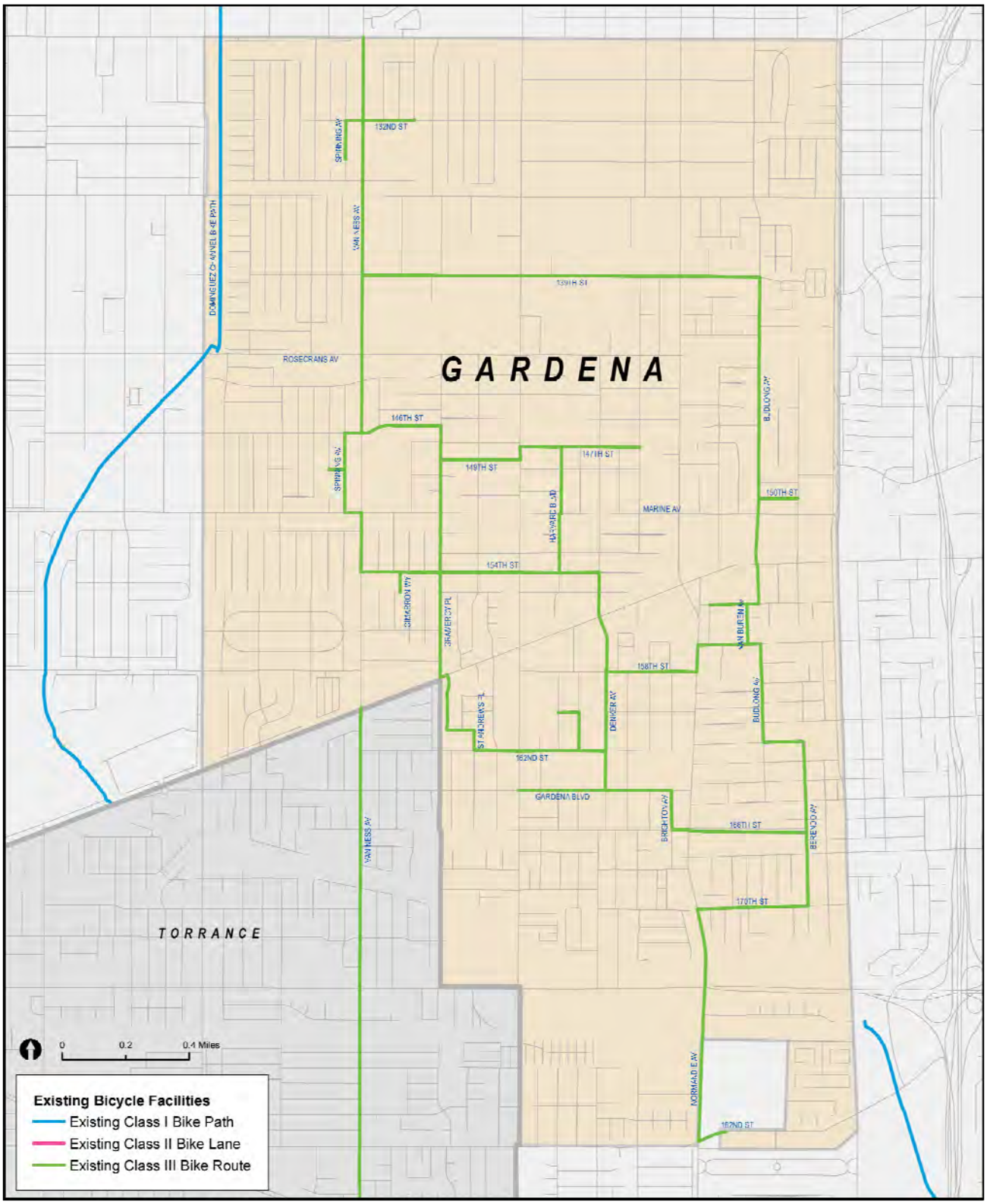


Figure 4-2: Existing Bicycle Facilities in Gardena

Table 4-2: Gardena Bicycle Network

Facility Type	Mileage
Class I (Bike Path)	1.1
Class II (Bike Lanes)	1.9
Class III (Bike Route)	12.7
Total Mileage	**15.7**

4.2.5 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. Gardena does not currently provide any publicly-accessible end-of-trip bicycle facilities within its jurisdiction.

4.2.6 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 Gardena. Metro operates several bus lines with routes through the City. Buses are equipped with bicycle racks, which are available on a first-come, first-served basis. The northern and southern portions of the City are served by bus routes, while the center of the City is left underserved. This requires those commuting to and from the interior of Gardena to travel longer distances to access transit, trips that would be made easier by bicycle given adequate bicycle facilities.

Torrance Transit Lines 1, 2, and 5, operated by the City of Torrance, also serve Gardena. **Appendix A-14** shows the Torrance Transit System Map. Buses are equipped with bicycle 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, and park and ride lots; and provisions for transporting bicycles on public transit vehicles. Gardena does not currently provide any intermodal end-of-trip bicycle facilities within its jurisdiction.

4.2.7 Education and Enforcement Strategies

Bicycle education programs and enforcement of bicycle-related policies help to make riding safer for all bicyclists. Gardena does not currently provide any education or enforcement programs that promote bicycle safety.

4.2.8 Past Bicycle-Related Expenditures

Between 2000 and 2010 the City of Gardena has not incurred any bicycle-related expenditure.

4.3 Needs Analysis

This section describes the needs of bicyclists in Gardena. 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.

4.3.1 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 Gardena that the community identified as desirable for bikeways and bicycle support facilities.

The most commonly identified locations for bicycle facilities in Gardena were residential streets, such as 139th Street, 146th Street, and 147th Street. The public also frequently mentioned arterial and collector streets, including Budlong Avenue, Normandie Avenue, Western Avenue, and Van Ness Avenue.

The community noted that additional bicycle parking facilities are desirable along transit routes.

4.3.2 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 Gardena by census tract. The highest percentages of bicycle commuters are located in central Gardena, followed by the northern portion of the City.

Table 4-3 presents commute to work data estimates reported by the 2000 US Census for Gardena. For comparative purposes, the table includes commute to work data for the United States,

The highest percentage of bicycle commuters in Gardena are located in the central portion of the city.

California, and County of Los Angeles. According to the estimates, 0.9 percent of residents in Gardena commute predominantly by bicycle. The percent of bicycle commuters in Gardena is higher than that of the County of Los Angeles. It is comparable to that of California and above the United States as a whole. It is important to note that this figure likely underestimates the true amount of bicycling that occurs in Gardena 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 Gardena that commute by transit is lower than that of those that drive alone. Gardena also has a high percentage of carpooling, but a low percentage of walking.

In addition to bicycle commuters in Gardena, 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 Gardena's bicycle network in **Section 4.4**.

Table 4-3: Means of Transportation to Work

Mode	United States	California	Los Angeles County	Gardena
Bicycle	0.38%	0.83%	0.62%	0.90%
Drove Alone – car, truck, or van	75.70%	71.82%	70.36%	75.21%
Carpool – car, truck, or van	12.19%	14.55%	15.08%	15.31%
Transit	4.73%	5.07%	6.58%	4.07%
Walked	2.93%	2.85%	2.93%	1.90%
Other Means	0.70%	0.79%	0.76%	0.55%
Worked at Home	3.26%	3.83%	3.49%	1.90%

Source: US Census 2000

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

Table 4-4: Existing Bicycling Demand

Variable	Figure	Source
Existing study area population	57,818	2000 US Census, P1
Existing employed population	23,363	2000 US Census, P30
Existing bike-to-work mode share	0.90%	2000 US Census, P30
Existing number of bike-to-work commuters	210	Employed persons multiplied by bike-to-work mode share
Existing work-at-home mode share	1.90%	2000 US Census, P30
Existing number of work-at-home bike commuters	44	Assumes 10% of population working at home makes at least one daily bicycle trip
Existing transit-to-work mode share	4.07%	2000 US Census, P30
Existing transit bicycle commuters	238	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)	7,714	2000 US Census, P8
Existing school children bicycling mode share	2.0%	National Safe Routes to School surveys, 2003.
Existing school children bike commuters	154	School children population multiplied by school children bike mode share
Existing number of college students in study area	4,431	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), review of bicycle commute share at the University of California, Los Angeles
Existing college bike commuters	222	College student population multiplied by college student bicycling mode share
Existing total number of bike commuters	868	Total bike-to-work, school, college and utilitarian bike trips. Does not include recreation.
Total daily bicycling trips	1,736	Total bicycle commuters x 2 (for round trips)

Table 4-5: Existing Bicycling Air Quality Impact

Variable	Figure	Source
Current Estimated VMT Reductions		
Reduced Vehicle Trips per Weekday	429	Assumes 73% of bicycle trips replace vehicle trips for adults/college students and 53% for school children
Reduced Vehicle Trips per Year	112,073	Reduced weekday vehicle trips x 261 (weekdays / year)
Reduced Vehicle Miles per Weekday	2,863	Assumes average round trip travel length of 5 miles for adults/college students and 1 mile for schoolchildren
Reduced Vehicle Miles per Year	747,195	Reduced weekday vehicle miles x 261 (weekdays / year)
Current Air Quality Benefits		
Reduced Hydrocarbons (lbs/wkday)	9	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)	6	Daily mileage reduction x 0.95 grams / mi
Reduced CO (lbs/wkday)	78	Daily mileage reduction x 12.4 grams / mi
Reduced C02 (lbs/wkday)	2,329	Daily mileage reduction x 369 grams / mi
Reduced Hydrocarbons (lbs/yr)	2,240	Yearly mileage reduction x 1.36 grams / mi
Reduced PM10 (lbs/yr)	9	Yearly mileage reduction x 0.0052 grams / mi
Reduced PM2.5 (lbs/yr)	8	Yearly mileage reduction x 0.0049 grams / mi
Reduced NOX (lbs/yr)	1,565	Yearly mileage reduction x 0.95 grams / mi
Reduced CO (lbs/yr)	20,426	Yearly mileage reduction x 12.4 grams / mi
Reduced $C0_2$ (lbs/yr)	607,847	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 4-6 presents projected year 2030 bicycling activity within Gardena 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 4-7 presents the associated year

2030 air quality benefit forecasts. The calculations follow in a straightforward manner from the Projected Year 2030 Bicycling Demand.

Table 4-6: Projected Year 2030 Bicycling Demand

Variable	Figure	Source
Future study area population	71,950	Calculated based on CA Dept. of Finance, *Population Projections for California and Its Counties 2000-2050.*
Future employed population	29,073	Calculated based on CA Dept. of Finance, *Population Projections for California and Its Counties 2000-2050*,
Future bike-to-work mode share	1.80%	Double the rate from 2000 US Census, P30
Future number of bike-to-work commuters	523	Employed persons multiplied by bike-to-work mode share
Future work-at-home mode share	2.58%	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	75	Assumes 10% of population working at home makes at least one daily bicycle trip
Future transit-to-work mode share	8.14%	Double the rate from 2000 US Census, P30
Future transit bicycle commuters	592	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)	6,130	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	245	School children population multiplied by school children bicycling mode share
Future number of college students in study area	5,514	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%	Equal to existing condition assumption from "Review of bicycle commute share in seven university communities" (Source: National Bicycling & Walking Study, FHWA, Case Study No. 1, 1995).
Future college bike commuters	386	College student population x college student bicycling mode share
Future total number of bike commuters	1,821	Total bike-to-work, school, college and utilitarian biking trips. Does not include recreation.
Total daily bicycling trips	3,642	Total bike commuters x 2 (for round trips)

Table 4-7 Projected Year 2030 Bicycling Air Quality Impact

Variable	Figure	Source
Forecasted VMT Reductions		
Reduced Vehicle Trips per Weekday	848	Assumes 73% of biking trips replace vehicle trips for adults/college students and 53% for school children
Reduced Vehicle Trips per Year	221,450	Reduced number of weekday vehicle trips x 261 (weekdays / year)
Reduced Vehicle Miles per Weekday	5,878	Assumes average round trip travel length of 8 miles for adults / college students and 1 mile for schoolchildren
Reduced Vehicle Miles per Year	1,534,186	Reduced number of weekday vehicle miles x 261 (weekdays / year)
Forecasted Air Quality Benefits		
Reduced Hydrocarbons (lbs/wkday)	18	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)	12	Daily mileage reduction x by 0.95 grams / mi
Reduced CO (lbs/wkday)	161	Daily mileage reduction x by 12.4 grams / mi
Reduced $C0_2$ (lbs/wkday)	4,782	Daily mileage reduction x by 369 grams / mi
Reduced Hydrocarbons (lbs/yr)	4,600	Yearly mileage reduction x by 1.36 grams / mi
Reduced PM10 (lbs/yr)	18	Yearly mileage reduction x by 0.0052 grams / mi
Reduced PM2.5 (lbs/yr)	17	Yearly mileage reduction x by 0.0049 grams / mi
Reduced NOX (lbs/yr)	3,213	Yearly mileage reduction x by 0.95 grams / mi
Reduced CO (lbs/yr)	41,941	Yearly mileage reduction x by 12.4 grams / mi
Reduced CO_2 (lbs/yr)	1,248,069	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 approximately 1,700 to roughly 3,600, resulting in a substantial reduction of both Vehicle Miles Traveled (VMT) and associated emissions. This includes a yearly emissions reduction by 2030 of approximately 3,200 pounds of smog forming N0X and approximately 1.2

million 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.

4.3.3 Bicycle Counts

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

4.3.3.1 Methodology

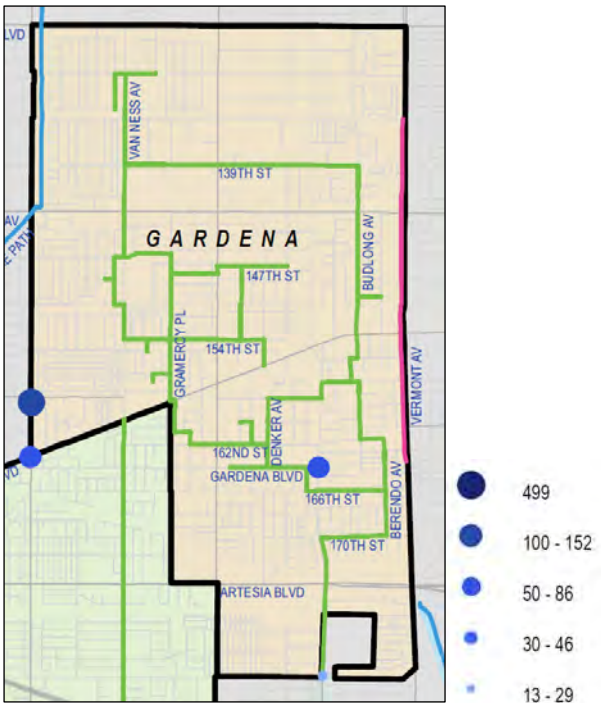
The methodology for the bicycle counts derives from the National Bicycle and Pedestrian Documentation Project (NBPD), a collaborative effort of Alta Planning + Design and the Institute of Transportation Engineers. The NBPD methodology aims to capture both utilitarian bicycling and recreational bicycling. 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 Gardena, volunteers were stationed at four stations on Thursday and three stations 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 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.

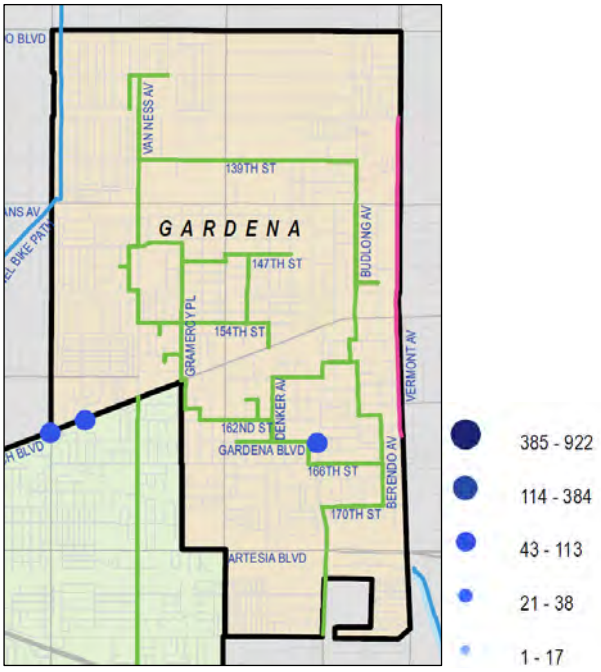
4.3.3.2 Results

The count results for the South Bay are displayed in **Appendix A-16** and **Appendix A-17**. Count results for Gardena are shown at



Weekday Bicycle Count Results in Gardena

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



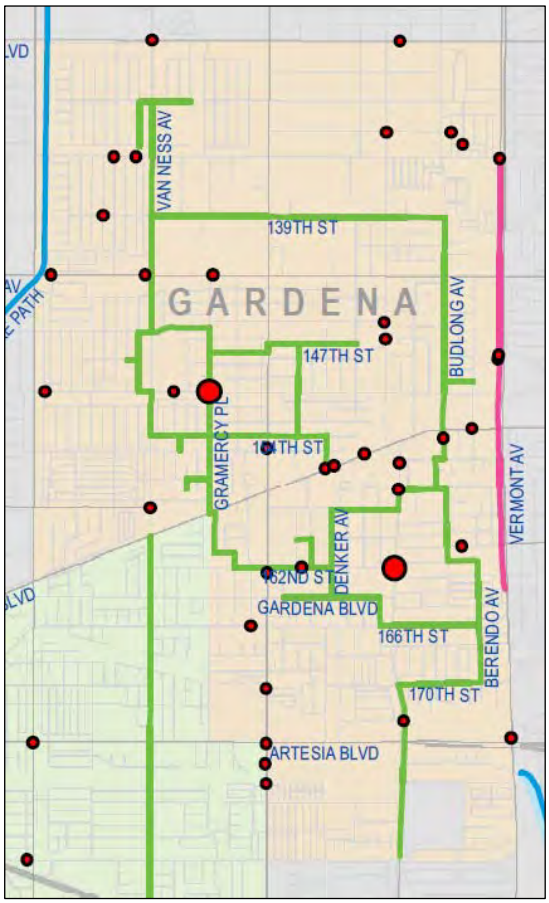
Weekend Bicycle Count Results in Gardena

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

right. Detailed count data, including a list of count locations, is presented in **Appendix H**. On Thursday, the Gardena station that experienced the highest volume was Crenshaw Boulevard and Manhattan Beach Boulevard with 106 bicyclists during the three hour counting period. The station with the highest number of bicyclists on Saturday was Crenshaw Boulevard and Redondo Beach Boulevard, which had 56 bicyclists during the three hour counting 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.



Bicycle Collisions in Gardena 2007-2009

(See Appendix A-18 for larger map)

4.3.4 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 collisions in Gardena. 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 4-8 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 Gardena are shown on the preceding page. There were 40 total reported collisions involving bicyclists in the City of Gardena from 2007-2009. Most of the crashes in Gardena were dispersed throughout the city, though the intersection of 162nd Street and Normandie Avenue and the intersection of Marine Avenue and Gramercy Place both experienced two collisions. Four collisions involving bicyclists occurred along Redondo Beach Boulevard in the eastern portion of the city. Likewise, six collisions involving bicyclists occurred on Western Avenue in the southern half of the city.

Table 4-8: Bicycle Collision Data 2007-2009

Total Crashes Involving Bicyclists	Number of Bicyclists Involved	Persons Injured	Persons Severely Injured	Persons Killed
40	40	40	0	0

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

As reported by police officers in traffic reports, bicyclists were at fault in 58 percent of collisions involving bicycles (23 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 the participating cities. There is no data available for Gardena.

4.4 Proposed Bicycle Network

This section presents the proposed bicycle network for the City of Gardena, 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 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 Gardena, 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 Gardena 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 Gardena consists of Class I Bike Paths, Class II Bike Lanes, Class III Bike Routes, and Bike Friendly Streets.

4.4.1 Proposed Bikeway Facilities

The proposed bicycle network for the City of Gardena consists of Class I Bike Paths, Class II Bike Lanes, Class III Bike Routes, and Bike Friendly Streets, and is shown in **Figure 4-3**. 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 4-9** lists the proposed bicycle paths, **Table 4-10** lists the proposed bicycle lanes, **Table 4-11** lists the proposed bicycle routes, and **Table 4-12** 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 Gardena connects with the recommended networks in Torrance and Lawndale, as well as the Los Angeles County bicycle system.

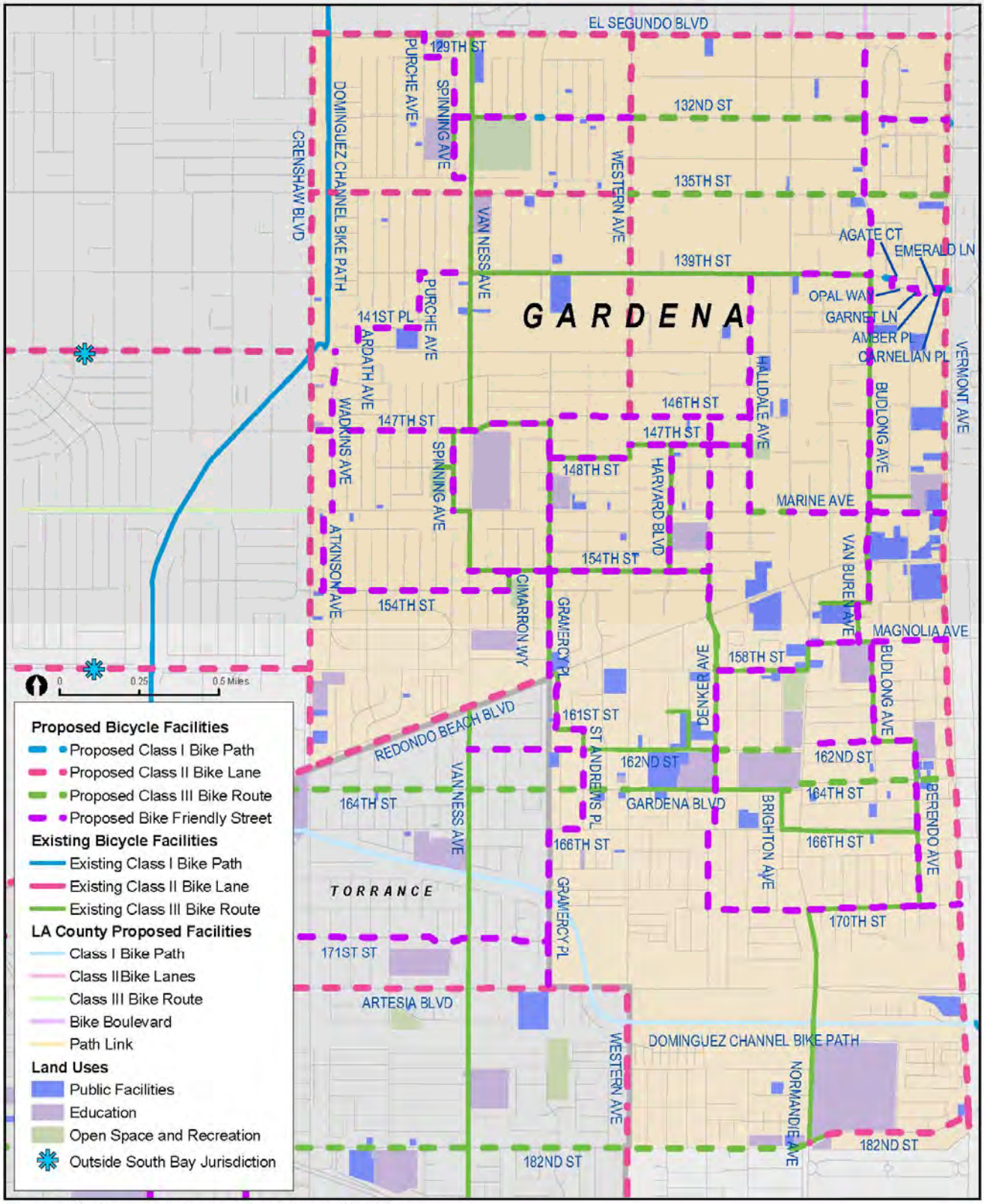


Figure 4-3: Proposed Bicycle Facilities in Gardena

South Bay Bicycle Master Plan

Table 4-9: Proposed Class I Bicycle Paths in Gardena

Street	From	To	Miles
132nd Street	Cimarron	Wilton	0.06
139th St Extension	Budlong Avenue	Agate Ct	0.07
Carnelian Place Extension	W side of Vermont Ave	E side of Vermont Ave	0.03
132nd Street Extension	W side of Vermont Ave	E side of Vermont Ave	0.03
Total Bicycle Path Mileage			**0.2**

Table 4-10: Proposed Class II Bicycle Lanes in Gardena

Street	From	To	Miles
Western Avenue	El Segundo Boulevard	146th Street	1.2
Crenshaw Boulevard	El Segundo Boulevard	Redondo Beach Boulevard	2.3
El Segundo Boulevard	Crenshaw Boulevard	Vermont Avenue	2.0
Vermont Avenue	El Segundo Boulevard	Electric Street	3.5
182nd Street	Normandie Avenue	Vermont Avenue	0.4
135th Street	Crenshaw Boulevard	Western Avenue	1.0
Total Bicycle Lane Mileage			**10.4**

Table 4-11: Proposed Class III Bicycle Routes in Gardena

Street	From	To	Miles
Denker Avenue	154th	158th	0.3
Gardena Boulevard - 164th Street	Brighton Avenue	Vermont Avenue	0.6
Gardena Boulevard	West City Limits	Western Avenue	0.2
182nd Street	Western Avenue	Normandie Avenue	0.7
132nd St	Western Avenue	Budlong Ave	0.7
135th Street	Western Avenue	Vermont Avenue	1.0
Marine Avenue	Halldale Avenue	Normandie Avenue	0.1
162nd Street	Denker Ave	Normandie Avenue	0.3
Total Bicycle Route Mileage			**3.9**

Table 4-12: Proposed Bicycle-Friendly Streets in Gardena

Street	From	To	Miles
Budlong Avenue - 155th Street - Van Buren Avenue - Magnolia Avenue - Budlong Avenue	El Segundo Boulevard	162nd Street	2.3
132nd Street	Spinning Avenue	Western Avenue (excluding BP from Cimarron to Wilton)	0.5
154th Street	Van Ness Avenue	Denker Avenue	0.8

Street	From	To	Miles
Berendo Avenue	162nd Street	170th Street	0.5
Harvard Boulevard	147th Street	154th Street	0.4
154th Street - 154th Place - Cimarron Way	Crenshaw Boulevard	154th Street	0.7
Denker Avenue	146th St	154th Street	0.5
Denker Avenue - 166th Street - Denker Avenue	158th St	170th Street	0.8
Purch Avenue - 129th Street - Spinning Avenue - 134th Place	El Segundo Boulevard	Van Ness Avenue	0.6
158th St	Denker Ave	Normandie Ave	0.3
Magnolia Ave	Normandie Ave	Vermont Ave	0.4
139th St	Normandie Ave	Budlong Ave	0.3
Agate Court - Opal Way - Garnet Lane - Amber Place - Emerald Lane - Carnelian Place	139th St Extension	Vermont Avenue	0.2
139th Street - Purche Avenue - 141st Place - Ardath Avenue	Van Ness Avenue	Rosecrans Avenue	0.6
Gramercy Place - Redondo Beach Boulevard - 161st Street - St Andrews Place	147th St	Gardena Boulevard	1.3
St Andrews Place - 166th St - Gramercy Place	Gardena Boulevard	Artesia Blvd	0.7
162nd Street	Normandie Avenue	Berendo Avenue	0.4
170th St	Denker Ave	Vermont Avenue	0.8
Spinning Avenue	147th Street	Marine Avenue	0.3
Marine Avenue	Normandie Avenue	Vermont Avenue	0.5
147th Street - 146th Place - Gramercy Place - 146th Street	Crenshaw Boulevard	Halldale Avenue	1.4
148th Street - Western Avenue - 147th Street	Marine Avenue	Halldale Avenue	0.7
Wadkins Avenue - Marine Avenue - Atkinson Avenue	Rosecrans Avenue	154th Street	0.8
132nd Street	Budlong Avenue	Vermont Avenue	0.3
Halldale Avenue	139th St	Marine Avenue	0.8
Gardena Boulevard	West City Limits	Western Avenue	0.3
Total Bicycle-Friendly Street Mileage			**16.8**

4.4.2 Proposed End-of-Trip Bicycle Facilities

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 Gardena Municipal Code currently does not provide bicycle parking standards. The City should amend its Municipal Code to include requirements on the quantity and type of bicycle parking to be provided at new and retrofitted multi-family residential, commercial, office, and mixed-use land uses of all sizes. Quantity of bicycle parking should be based on square footage of developments or by number of employees/residents to adequately address the bicycle demand at each development.

The City should also amend its Municipal Code to include requirements on types of both short- and long-term bicycle parking facility designs, which are shown in **Appendix J**. Bicycle rack designs should include racks 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. Gardena'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.

The City should also amend its Municipal Code to include requirements on types of both short- and long-term bicycle parking facility designs.

Figure 4-4 displays proposed short- and long-term bicycle parking locations in Gardena. The City should ensure there is adequate short-term bicycle parking in the form of bicycle racks at all major trip attractors, including commercial and civic activity centers and transit hubs. The City should prioritize the installation of bicycle parking throughout the city, with particular attention directed at the following locations:

- Parks
- Schools
- Commercial/office areas
- Civic/government buildings
- Public transit stations

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

High-activity locations such as transit stations, offices, and major commercial districts, should provide more secure, long-term bicycle parking options, such as bicycle lockers.

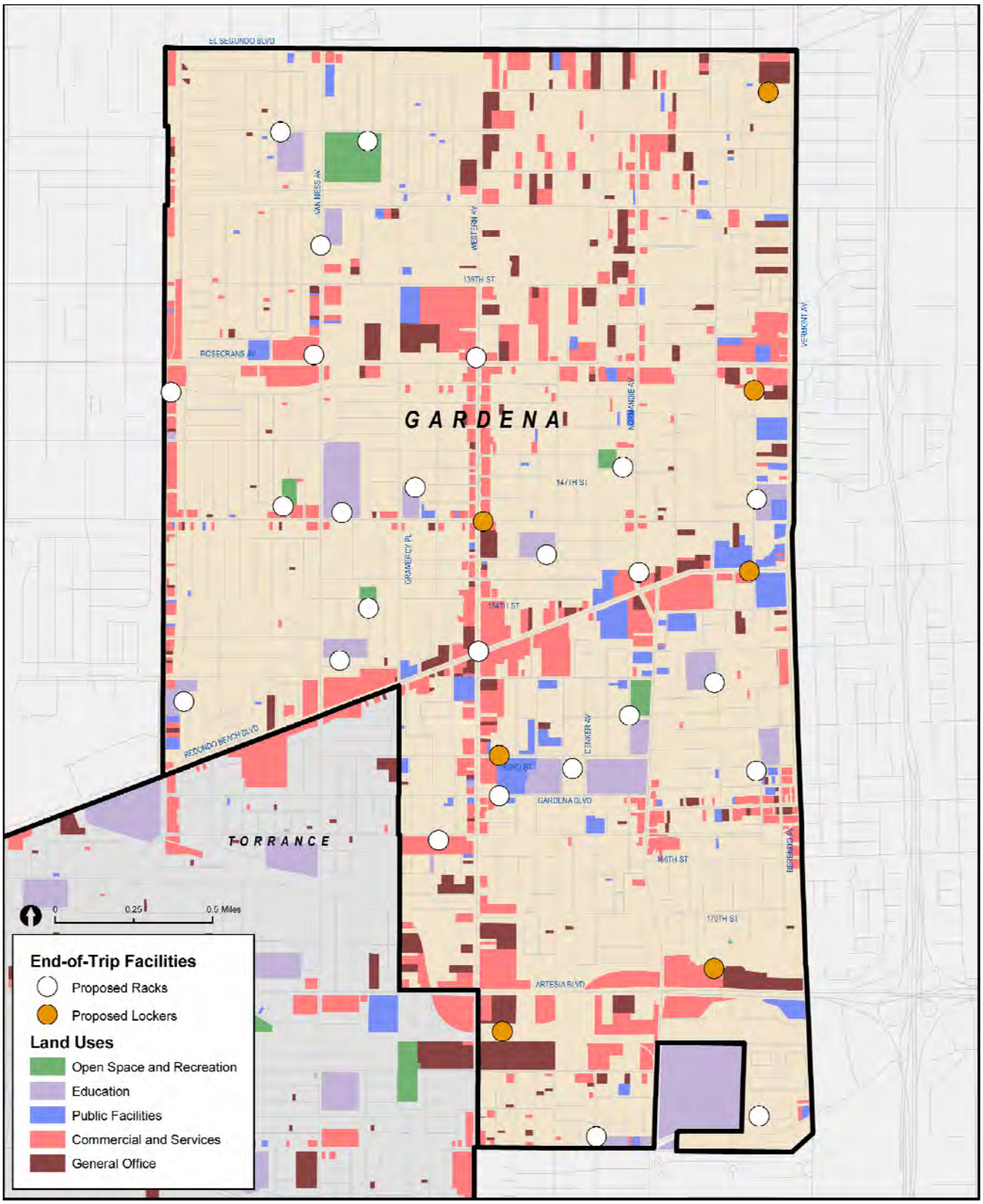


Figure 4-4: Gardena Proposed End-of-Trip Facilities

4.5 Project Costs

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

4.5.1 Cost Estimates

Table 4-13 displays the planning-level capital cost assumptions for each facility type proposed in this plan and **Table 4-14** displays the cost to implement the proposed network in the City of Gardena from the cost assumptions.[16] 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 4.7**.

Table 4-13: Unit Cost Estimates for Proposed Bicycle Facility Types

Facility Type	Description	Estimated Cost[17]
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

[16] **Table 4-14** assumes the cost of implementing Class III Bicycle Routes with Sharrows based on the policies presented in **Chapter 2**

[17] 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 4-14: Estimated Cost of Proposed Bicycle Network

Facility Type	Unit Cost per mile	Length of Proposed Network (miles)	Cost
Bicycle Path	$800,000	0.2	$ 152,000
Bicycle Lane	$40,000	10.4	$ 416,000
Bicycle Route with sharrows	$25,000	3.9	$ 97,000
Bicycle-Friendly Street	$30,000	16.8	$ 505,000
Total		**31.3**	**$ 1,170,000**

4.6 Project Prioritization

A prioritized list of bicycle projects will help guide the City of Gardena in implementing the proposed bicycle facilities presented in this Plan. Each proposed facility discussed in **Section 4.4.1** is grouped into projects based on feasibility of implementation. **Table 4-15** 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 Gardena. The projects ranked the highest should be implemented first.

Table 4-15: Gardena 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
BFS	Budlong Avenue - 155th Street - Van Buren Avenue - Magnolia Avenue - Budlong Avenue	El Segundo Boulevard	162nd Street	3	6	2	2	0	1	2	2	1	2	**21**
BFS	154th Street	Van Ness Avenue	Denker Avenue	6	6	0	0	0	0	0	2	2	2	**18**
BFS	Berendo Avenue	162nd Street	170th Street	6	6	0	0	0	0	0	2	2	2	**18**
BFS	Harvard Boulevard	147th Street	154th Street	6	6	0	0	0	0	0	2	2	2	**18**
BFS	158th St	Denker Ave	Normandie Ave	6	6	0	2	0	0	0	2	2	0	**18**
BFS	Magnolia Ave	Normandie Ave	Vermont Ave	6	6	0	2	0	0	0	2	2	0	**18**
BFS	154th Street - 154th Place - Cimarron Way	Crenshaw Boulevard	154th Street	3	6	1	2	0	0	0	1	2	2	**17**
BFS	Denker Avenue	146th St	154th Street	3	6	0	2	0	0	0	2	2	2	**17**
BR	Denker Avenue	154th	158th	3	6	0	2	0	0	0	2	2	2	**17**
BFS	Denker Avenue - 166th Street - Denker Avenue	158th St	170th Street	3	6	0	2	0	0	1	2	1	2	**17**
BL	Western Avenue	El Segundo Boulevard	146th Street	0	6	2	2	0	0	2	2	1	1	**16**
BFS	Purch Avenue - 129th Street - Spinning Avenue - 134th Place	El Segundo Boulevard	Van Ness Avenue	3	6	0	2	0	0	0	1	2	2	**16**
BL	Crenshaw Boulevard	El Segundo Boulevard	Redondo Beach Boulevard	0	6	0	4	0	0	2	2	0	2	**16**
BR	Gardena Boulevard - 164th Street	Brighton Avenue	Vermont Avenue	3	6	0	0	0	0	1	2	2	2	**16**

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 - BP - BFS - BP	139th Street - Agate Court - Opal Way - Garnet Lane - Amber Place - Emerald Lane - Carnelian Place	Normandie Ave	Vermont Ave	3	6	0	0	0	2	1	2	0	2	**16**
BFS - BP - BFS	132nd Street	Spinning Avenue	Western Avenue	3	3	0	4	0	0	0	2	1	2	**15**
BL	El Segundo Boulevard	Crenshaw Boulevard	Vermont Avenue	0	6	0	2	0	1	2	2	0	2	**15**
BFS	139th Street - Purche Avenue - 141st Place - Ardath Avenue	Van Ness Avenue	Rosecrans Avenue	3	6	0	0	0	0	1	1	2	2	**15**
BL	Vermont Avenue	El Segundo Boulevard	Electric Street	0	6	2	0	0	2	2	2	0	1	**15**
BFS	146th St - Gramercy Place - Redondo Beach Boulevard - 161st Street - St Andrews Place - 166th St - Gramercy Place	147th St	Artesia Blvd	0	6	0	2	0	1	2	1	1	2	**15**
BFS	162nd Street	Normandie Avenue	Berendo Avenue	6	3	0	0	0	2	1	1	1	1	**15**
BFS	170th St	Denker Ave	Vermont Avenue	6	3	0	0	0	0	0	2	1	2	**14**
BFS	Marine Avenue	Normandie Avenue	Vermont Avenue	3	3	0	0	0	0	2	2	2	2	**14**
BR	Gardena Boulevard	West City Limits	Western Avenue	3	3	0	0	0	0	1	1	2	2	**12**
BFS	147th Street	Crenshaw Boulevard	Western Avenue	3	3	0	0	0	0	1	2	1	2	**12**

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	148th Street - Western Avenue - 147th Street	Gramercy Pl	Halldale Avenue	3	3	0	0	0	0	1	2	1	2	**12**
BFS	Spinning Avenue	147th Street	Marine Avenue	3	3	0	0	0	0	0	1	2	2	**11**
BFS	Wadkins Avenue - Marine Avenue - Atkinson Avenue	Rosecrans Avenue	154th Street	3	3	0	0	0	1	0	1	1	2	**11**
BR - BL	182nd Street	Western Avenue	Vermont Avenue	0	3	0	2	0	0	1	2	1	1	**10**
BR	Marine Avenue	Halldale Avenue	Normandie Avenue	0	0	0	2	0	2	2	2	2	0	**10**
BFS	Gardena Boulevard	West City Limits	Western Avenue	3	0	0	2	0	0	1	2	2	0	**10**
BFS - BP	132nd Street	Budlong Avenue	Vermont Avenue	3	0	1	0	0	0	0	2	1	2	**9**
BR	132nd St	Western Avenue	Budlong Ave	3	0	1	0	0	0	0	2	1	2	**9**
BFS	Halldale Avenue	139th St	Marine Avenue	3	0	0	2	0	0	0	2	2	0	**9**
BL	135th Street	Crenshaw Boulevard	Western Avenue	3	0	0	0	0	1	1	2	0	1	**8**
BR	135th Street	Western Avenue	Vermont Avenue	0	0	1	2	0	2	0	2	1	0	**8**
BR	162nd Street	Denker Ave	Normandie Avenue	0	0	0	2	0	0	0	2	2	0	**6**

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

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4.7 Project Sheets

The City of Gardena 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

Gardena Project #1: Western Avenue (El Segundo Boulevard to 146th Street)

Project Site

Western Avenue is a north-south arterial located in the center of the City of Gardena. It connects to the County of Los Angeles to the north and the City of Torrance to the South. Western Avenue provides access to a wide variety of commercial and industrial services. There is existing on-street parallel parking along the entire street.

Western Avenue has two travel lanes in each direction, a center turn lane, and a posted speed limit of 35 mph. From El Segundo Boulevard to 139th Street, Western Avenue has a roadway width of approximately 78 to 80 feet. There are center medians north and south of the intersection of 135th Street with 32 feet of roadway width on each side. South of 139th Street, the roadway width of Western Avenue drops to 75 feet. There is a center median north of Rosecrans with a roadway width of approximately 30 to 31 feet on each side. On the northbound side of the median there are three travel lanes. The third travel lane terminates after the median ends.

Project Challenges

Western Avenue has no existing bicycle facilities, thus bicyclists must share the road with high volumes of vehicles traveling at high speeds on an arterial street. Center medians and on-street parking reduce the available space for bicycle facilities.

Proposed Improvements

- Stripe 1.2 miles of Class II Bike Lanes
- Add bicycle loop detectors and pavement markings at all signalized intersections
- Remove approximately 25 on-street parking spaces and the third northbound travel lane at the center median north of Rosecrans Avenue
- Install wayfinding signage after the implementation of the bike friendly street on 146th Street to guide bicyclists from Western Avenue to bike friendly street

Estimated Cost

$100,000

Photos

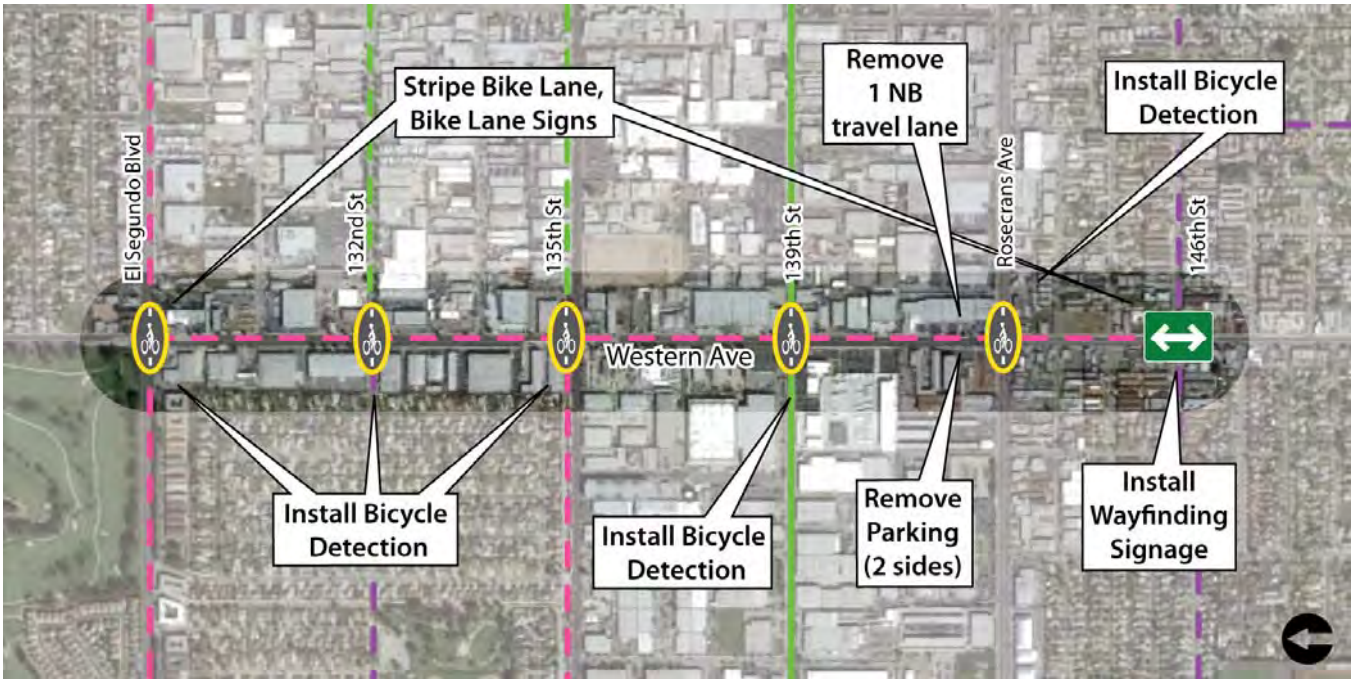
Looking north on Western Avenue. Bicyclists must share the road with high volumes of motorized vehicles.

A third northbound travel lane along the center median at Rosecrans Avenue does not provide adequate roadway width for a bicycle lane.

Bicycle detectors at signalized intersections will position bicyclists to trigger the signal when no vehicles are present.

Aerial Map and Concept Graphics: Western Avenue

Western Avenue (El Segundo Boulevard to 146th Street)



Bike Lanes Next to On-street Parking and Bike Lane with Buffer

Gardena Project #2: 146th Street – Gramercy Place – 161st Street – St. Andrews Place – 166th Street – Gramercy Place (Western Avenue to Artesia Boulevard)

Project Site

146th Street – Gramercy Place – 161st Street – St. Andrews Place – 166th Street – Gramercy Place is a series of primarily residential streets in the center of the City of Gardena. It connects to proposed bike lanes on Western Avenue to the north and connects to Artesia Boulevard to the south. This segment provides access to Chapman Elementary School and several industrial uses. There is on-street parallel parking along most of this segment.

146th Street – Gramercy Place – 161st Street – St. Andrews Place – 166th Street – Gramercy Place has two travel lanes in each direction. Gramercy Place – 161st Street – St. Andrews Place from Redondo Beach Boulevard to 162nd Street has a striped center lane. There is a signalized intersection at Gramercy Place and Redondo Beach Boulevard, and many stop controlled intersections throughout the segment.

Project Challenges

While 146th Street – Gramercy Place – 161st Street – St. Andrews Place – 166th Street – Gramercy Place consists of primarily quiet residential streets, the streets jog from one to the other and lack connectivity making it difficult to navigate by bicycle. Intersections with Western Avenue and Artesia Boulevard are stop controlled on the minor street which makes it challenging for bicyclists to cross the arterials and initiate left turns. South of 166th Street, Gramercy Place has several industrial services which potentially attract vehicular traffic.

Proposed Improvements

- Install signage and stripe pavement markings, such as sharrows or bike friendly street stencils
- Add bicycle loop detectors and pavement markings at all signalized intersections
- Install wayfinding signage at locations where the bike route curves
- Stripe bike left turn lanes on 166th Street at St. Andrews Place and 166th Street at Gramercy Place
- Install High Intensity Activated Crosswalks (HAWKs) across Artesia Boulevard and Western Avenue
- Construct speed humps on Gramercy Place south of 166th Street

Estimated Cost

$200,000

Photos

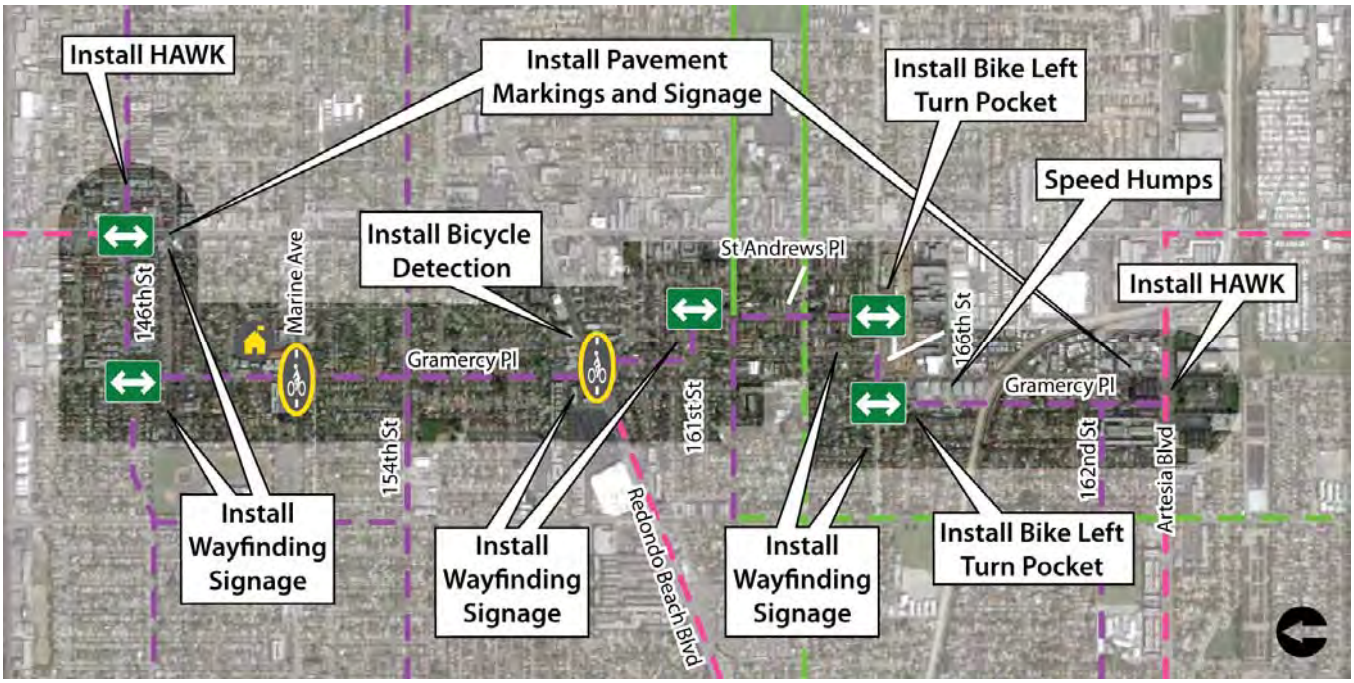
A HAWK across Artesia Boulevard will allow bicyclists and pedestrians to safely cross busy arterials.

A HAWK across Western Avenue will allow bicyclists and pedestrians to safely cross busy arterials.

A bike left turn pocket on 166th Street at Gramercy Place will provide bicyclists a protected place to queue.

Aerial Map and Concept Graphics: 146th Street – Gramercy Place – 161st Street – St. Andrews Place – 166th Street – Gramercy Place (Western Avenue to Artesia Boulevard)

146th Street – Gramercy Place – 161st Street – St. Andrews Place – 166th Street – Gramercy Place (Western Avenue to Artesia Boulevard)



Example Bike Left Turn Pocket and HAWK

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